ADVENTURES IN LONG-DISTANCE MOVING: THE ACQUISITION OF COMPLEX WH-QUESTIONS

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Chapter II

Experimental Studies

This chapter presents the results of several experimental investigations of children's knowledge of the constraints on long-distance Wh-movement. The experiments were designed to test children's knowledge of the partial syntactic paradigms associated with wanna contraction, the ECP and Strong Crossover. Each experiment forms a separate section of the chapter. In some cases, additional experiments and the results of children's response to controls sentences are presented, when these are relevant to theoretical proposals from the literature. For example, in the section on Strong Crossover, one experiment investigated children's knowledge of the constraint in 1-clause questions, and another experiment investigated two-clause questions. This was done to address the claim by Roep (1990) and taken up by Lebeaux (1988) that children interpret 1-Clause Crossover questions correctly, but not 2-Clause questions. In addition, children's responses to crossover questions are contrasted with their responses to questions that are governed by Principle B, and another experiment examined children's understanding of Weak Crossover questions. In the previous chapter, we saw that Sportiche's Principle B account of Strong Crossover carried over to Weak Crossover as well. It is important in evaluating this proposal, therefore, to know whether or not children treat the two constructions alike. Finally, an experiment eliciting Bound Pronoun and Crossover questions is also reported, to demonstrate children's ability to produce the appropriate Crossover structures in the appropriate situation.

In addition to testing constraints within the theory of Universal Grammar, the experiments on wanna contraction and the ECP provide a wealth of new production data which can be used to assess previous claims about children's knowledge of long distance questions. For example, recent literature contains the claim that functional categories, such as COMP, mature. Maturation is invoked to explain the absence of COMP in young children's productions (Radford, 1989). The suggestion is that maturation takes place around 24 months (±20%), making the claim is about a very early stage of development. Assuming that COMP does mature at this early age would lead us to expect children to produce complex (2-Clause) questions shortly after 24 months. In any event, it seems reasonable to expect that three-and four-year-old children should be able to produce and understand long-distance questions. Competence with the structure associated with long-distance movement is not attested in the previous literature, however. There are some anecdotal reports of embedded questions in the speech of children younger than three- or four-years-old. Limber (1973) reports that embedded questions like "I remember where it is" and "I don't know who is it" occur in children's spontaneous speech at about two-and-a-half years of age. Bloom, Tackell, and Lahey (1984) report an occasional for complementizer appearing at just under three, but they note that this form of complementation only appears after nouns and adjectives, as in hard for, early for, time for, and so on.
For this reason, the authors do not take the data to be indicative of productive syntactic complementation. The occasional complementizer that occurred in the speech of the same children, but according to Bloom et al. (1980), it was not used productively. To my knowledge, there is no other literature reporting young English-speaking children's performance with this structure.

The paucity of data makes it difficult to paint a detailed picture of children's development of long-distance questions. It is my contention, however, that this simply means that we should not rely solely on children's spontaneous productions in drawing conclusions about syntactic development. The present studies redress this problem by supplementing the existing data with the findings of studies investigating children's knowledge in experiments designed to elicit complex questions from children.

Although this is the first attempt to gather data in this way, it is not the first time an experimental approach to the study of children's knowledge of the constraints on multiple-clause constructions has been undertaken. One set of experimental studies was conducted by Phinney (1981), who designed a picture verification comprehension task and an imitation task to test children's knowledge of sentential complements. Phinney interpreted the results of her experiments, however, as evidence of the gradual development of the structure for embedded complements. According to her analysis of the findings, children begin to interpret sentential complements with an embedded clause consisting of a bare S, without a COMP position. Only later, after exposure to positive evidence does the S' (and the complementizers for and that) become available. The results that led Phinney to this analysis are reviewed later, in the discussion of children's knowledge of the that-trace paradigm. For now, it will suffice to note that the results of the experiments reported in this chapter do not support Phinney's analysis. Children as young as 2;10 are found to produce long-distance questions. These data make it clear that the relevant knowledge of the structures of syntactic complementation are available at an earlier age than was suggested by prior studies. These data, then, bring the acquisition facts more in line with the position that there is early maturation of the structures underlying long-distance movement.

The elicitation experiments also provide data that allow us to compare children's knowledge about questions in which constituents are extracted from tensed clauses versus ones involving extraction from infinitival clauses. This proves important in providing an account of some children's incorrect question forms, which were uncovered in two different experiments. The incorrect forms appeared when children asked questions involving extraction from tensed clauses, but not in questions where extraction was from infinitival clauses. These non-adult questions, which I term 'medial-Wh' questions, include utterances like "Who do you think who is in the box?". Although these questions appeared consistently with some children, they have not been previously documented in the production literature. Whereas the children in the Phinney study chose to delete complementizers, for the most part, the medial-Wh appeared with considerable regularity in some children's questions, suggesting that, in some children's grammars, it is obligatory to fill the embedded COMP position in Wh-questions. The nature of the grammars of these children who ask "exceptional" questions is explored in Chapter III.
Unexpected question forms like this one are important because they shed new light on children’s early grammars.\textsuperscript{32} In the present context, if we assume that the extra Wh-phrase appears in the embedded COMP position, these questions provide further evidence that the S’ and COMP position required for generation of long-distance questions are available at an early age. These data argue against the view that the relevant phrase structure is available only late in the course of development.

As these introductory remarks make clear, one of the central goals of this research is to bring empirical data to bear on current linguistic theory. It will be useful, in this regard, to introduce the experimental tasks that are employed in this research. These two tasks, the elicited production task and the Truth-Value Judgment task are introduced next. Following this I will provide a sketch of how these tasks will be used to probe children’s knowledge of linguistic constraints.

Much of our present knowledge of child grammar comes from longitudinal or ‘diary’ studies. It is worth mentioning the hazards involved in inferring syntactic competence, or lack of it, from this source (see Crain and Fodor, 1990; Hamburger and Crain, 1982). Diary studies chart the course of language acquisition by observing children at regular intervals over a number of years. Once every month or two, a child’s speech is recorded for an hour or more, while he or she is at play with a caretaker. This sort of data base can tell us the frequency with which children use particular constructions. But a problem with this method is that the absence of a structure in the spontaneous speech of young children is sometimes taken to indicate its absence in their grammars. This inference is clearly unwarranted, since even adults use certain constructions only infrequently, possibly due to processing exigencies. It is likely that these “rare” constructions, full passives for example, will not turn up at all in a limited data sample of children’s speech, for the same reasons. When they do by chance appear, their relative infrequency often results in their dismissal as freak occurrences. These data are rarely taken as evidence that the construction has “come in” to the child’s grammar. Moreover, since children produce these constructions only rarely, they will not appear in the records of some children until they are quite old. There is the danger that this could be erroneously interpreted as evidence that these constructions are acquired late. In short, data from spontaneous speech samples do not provide us with a reliable and plentiful source of the targeted syntactic structure.

If a child has competence with a structure, though, we should ask why it might fail to appear in his or her speech. One reason could be that the situations children are engaged in are unconstrained. Given a situation that is amenable to more than one description, children (and adults) may exhibit a preference for the simplest means of expression. More complex expressions may be avoided, for one thing, if they call for complex morphology which the child is still unsure of. To give an example, children may avoid the passive structure even if it is made available by the grammar because they are unsure of the passive participle; whether to use a ‘got’ passive or a ‘be’ passive; what preposition to use in the ‘by-phrase;’ and so on. Confronted with these complexities, the child might elect to use an object gap question such as “Which giraffe did the alligator bite?” Instead of using a passive such as “Which giraffe got bitten by the alligator?” (Crain, Thornton and Murasugi, 1987; Crain and Fodor, 1990).
There is a problem with relying on data from children's spontaneous production. It cannot provide much information about children's knowledge of rules that are optional in the grammar, for example certain rules allowing deletion. It is not possible to tell from children's omission of elements whether this is in keeping with knowledge that the rule is optional, or whether the child does not have the rule that allows the presence of the element. An example that is relevant in this chapter is children's use of complementizers. As noted, the fact that children did not imitate the complementizers in previous research should not be interpreted as indicating that complementizers are unavailable. Rather, their absence might reflect the optionality of complementizers in many constructions, and the tendency by children to use 'reduced forms'.

Another structure involving an optional rule is the passive, in which the rule generating the by-phrase is optional. For example, in situations where a full passive might be used, instead of saying "Which giraffe got bitten by the snake?", a child might opt for "Which giraffe bit?". But the child's avoidance of the full passive structure does not allow us to conclude that the structure for full passives is unavailable. Of course, this is a logical possibility, and, in fact, it has been proposed that this is a case where the full passive is unavailable before about age four (Borer and Wexler, 1987). The point is that, on the basis of children's spontaneous productions, it is difficult to tell whether a optional element is unavailable in the grammars of children, or is just missing in their speech, due to a tendency to use 'reduced forms'.

In elicited production tasks, the input is a situation that has been specially designed to evoke a unique sentence meaning, and the behavior we observe is the utterance that the child uses to describe that situation (see Hamburger and Crain, 1982). When the pragmatic define a structure to be uniquely felicitous, if the structure is made available by the grammar, the child should call on it, even if it is not a structure that is ordinarily used or attempted. Let us consider this point with respect to long-distance questions, our target structure. Long-distance questions are used only infrequently in three-and four-year-old children's spontaneous speech. One reason for their rare appearance is that, in the majority of cases, a matrix question will suffice to communicate the intended meaning. In eliciting long-distance questions like "Who do you think ate the cookie?", then, it was important to focus the pragmatics on who did eat the cookie, but on who might have eaten the cookie. To elicit these complex questions, one experimenter, watched by the child, acted out a scenario with toys while the puppet, (played by a second experimenter) hid. After the scenario had taken place, the puppet had to guess about what had happened. In this situation, it was appropriate to question the puppet with "Who do you think ate the cookie?" or "What do you think is in the box?" since the puppet had not witnessed the action and did not know the answer.

Besides affording experimental control over the content of children's utterances, there is another advantage of the elicited production technique over the usual comprehension measures, such as figure manipulation and picture verification. The advantage lies in the 'output' of the experiment, which are children's utterances (in explicit contexts). It is not necessary to infer the child's linguistic competence from our observation of non-linguistic behavior. Children's utterances provide a more direct reflection of the grammar. Because there are so many ways to combine words incorrectly, correct combinations of words are not likely to come about by accident. As long as children's productions are appro-

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32 This point is discussed in detail in the section on issues of competence and performance in Chapter III.
appropriate to the context and are not merely imitations of the experimenter's utterances, even a single successful production of the target sentence is a good indicator of underlying linguistic competence.

As a final comment, it is worth noting that the technique of elicited production is particularly suited to the study of linguistic constraints. The strategy used in the experiments reported below is to set up situations in which the utterance excluded by the constraint would be appropriate. In situations that bias children toward production of sentences that violate the constraint, their consistent failure to produce utterances which do violate the constraint is even stronger evidence of its existence in their grammars. Next we turn to comprehension tasks, and the Truth-Value Judgment task.

To test comprehension, it is common to present utterances as input, and to observe some aspect of the child's behavior. For example, in a picture-verification task used in Phinney's experiments, children's selection of one picture rather than another was taken as indicative of their grammatical knowledge. Similarly, in an "act-out" task, the child is directed by the experimenter to act out the meaning of a sentence. The scenario acted out by the child is then taken to be representative of how the child understood the sentence generated. While this methodology is appropriate in addressing certain theoretical issues, it is not suited to the investigation of others. For example, it is particularly cumbersome to use an act-out task to investigate children's knowledge of constraints on coreference. Since a constraint on coreference rules out a particular interpretation of a sentence, children who abide by the constraint should not act out the target sentences in keeping with the illicit interpretation. However, it is not proper to infer from the fact that a child acts out a sentence meaning in a particular way, that the alternative, incorrect interpretation is not also possible. Even for completely ambiguous sentences, subjects will exhibit a preferred interpretation of a sentence. It cannot be inferred that the alternative interpretation is unavailable. This makes the act-out task poorly suited to testing constraints on some grammatical construction, except in cases where it can be established, on the basis of a different construction, that subjects prefer to act out sentence meanings in a way that is inconsistent with the constraint.

It has been argued by Hamburger and Crain (1984; 1987) that one drawback of the act-out task is that it forces children to formulate a plan for execution of the sentence meaning. If the plan is complex to formulate or execute, the enactment of the sentence may run awry, making the action that is observed a poor reflection of the syntactic structure that was generated. If children are presented with tasks in which the planning characteristics are controlled, on the other hand, their syntactic competence should not be masked.

A comprehension task that has met with considerable success in revealing children's true syntactic competence is the Truth-Value Judgment task developed by Crain and McKee (1985). In this task, children are engaged in a game in which they judge the truth of the utterance of a puppet, Kermit the Frog, who is played by one of two experimenters. Both the child and Kermit watch a staged event with several characters and props. Following the event, Kermit says what he thinks happened. Kermit sometimes says what really happened, but sometimes he doesn't pay attention and gets it wrong. The child's task is to judge the truth or falsity of Kermit's statement, and Kermit is rewarded or punished, depending on whether he was right or wrong. In this task, then, the child's task is minimal. Because the event is staged for them, the planning stage of an act-out task is
eliminated. All the child needs to do is make the judgment. This makes it available as a task which can be used with even two-year-old children.

The Truth Value Judgment task is particularly well suited for the investigation of constraints on sentence interpretation. The experimenter can pair the target utterance with two meanings, the one that is appropriate, and also the meaning that is disallowed by the constraint. Children who respect the constraint should judge the utterance by the puppet to be appropriate in the first case, but not in the second. Thus, this technique provides a direct test of whether children reject an utterance when it is paired with a meaning that is ruled out by a principle of Universal Grammar. For this reason, this task was chosen to test children's interpretation of the Strong Crossover paradigm.

We now turn to the general research strategy common to all of the experiments. The experiments tested three partial syntactic paradigms, using the same basic approach. In each study, an attempt was made, first, to establish a situation in which the child subjects would prefer to utter or interpret a sentence in a way that was ruled out by the relevant constraint, if the constraint were absent from their grammars. If children went against this preference, and chose to override it, in favor of the grammatical constraint, this was taken as evidence of their adherence to the principle of Universal Grammar. For example, in testing the constraint on contraction across Wh-Trace, the strategy was to establish a preference for contraction of want and to. This preference was established by having children ask object extraction questions, where wanna is permitted. Having shown that children favor contraction where it is permitted, I then elicited questions for which wanna contraction is inadmissable, according to the constraint under investigation. If contraction failed to appear in these questions, then children's failure to follow their preference to contract could be interpreted as evidence of their knowledge of the constraint on contraction.

The Strong Crossover experiment followed a comparable strategy in testing children's comprehension. There, the goal was to establish first that children prefer a bound interpretation of a pronoun where this is permitted in the grammar, i.e., in Bound Pronoun questions. Having established the preference, the strategy was to see whether or not children exhibited the same preference in cases where a bound pronoun interpretation would be in violation of a principle of Universal Grammar. Again, if it was found that children override their preference, this would constitute evidence that they are abiding by the relevant principle; in this case, Principle C of the Binding Theory.

The research strategy employed here can be summarized as follows. The experiments on wanna contraction and the ECP carried out this basic research strategy using the technique of elicited production. Children were placed in two different situations; a control situation in which questions with contraction or use of a complementizer were permissible, and a target situation which was appropriate to production of sentences excluded by the grammar. Children's productions in this target situation were carefully examined for adherence to the constraint. Lack of knowledge of the constraint would be reflected in production of an ungrammatical sentence. In the wanna contraction experiment, this would be a subject extraction question with contraction, and in the ECP experiment, it would be a subject extraction question with an overt complementizer. Acknowledgement of the existence of the constraint, on the other hand, should lead the child to seek an alternative means of expression in the target situation, one without contraction or a complementizer, for example. In sum, in these elicited
production experiments, children are presented with a situation, or a "meaning", and the strategy is to see what utterance they assign to it. This can be represented using the utterance/meaning pair notation introduced in Chapter I (adapted from Crain, forthcoming):

**CONSTR**RAINT: <meaning, *utterance>

**EXPERIMENT:**

Input: <meaning> → Possible Responses:

- <utterance>
- or < utterance>

In the experiment on Strong Crossover, the strategy was to present the child with an utterance, and examine the meaning(s) children could assign it. This was achieved using the Truth Value Judgment task. One experimenter acted out an event with toys, and a puppet uttered a Crossover sentence to describe it. The child judged whether the sentence could have the illicit meaning acted out in the story (in which the pronoun was given a bound interpretation). This can be represented as follows:

**CONSTR**RAINT: <utterance, *meaning>

**EXPERIMENT:**

Input: <utterance> → Possible Responses:

- <meaning>
- or < meaning>

In all three experiments, the goal was to establish a preference for a particular phenomenon (contraction, use of a complementizer, a bound interpretation of pronouns) in a control environment. It was not always possible to meet this goal, however, since children were free to choose alternative options made available by their grammars. In the wanna contraction experiment, for example, although the expectation was for children to produce object extraction questions with contraction, production of the uncontracted form "want to" was also appropriate in the control situation. That is, children had a choice between (1a) or (1b):

**CONTROL**

(1a) Who do you want to help?
(1b) Who do you wanna help?

**TARGET**

(2a) Who do you want to help you?
(2b) "Who do you wannahelp you?"

If children chose only to use the uncontracted question form, it was not possible to prove that they had acquired the rule of wanna contraction ("want + to → wanna"). Therefore, these children could not be used to evaluate adherence to the constraint. As we will see, however, a preference did emerge for most children to produce object extraction questions like (1b). This was in keeping with the parsing preference to reduce forms (Lasnik, 1990). This preference established the control necessary for the subject extraction target questions such as (2b).

The same parsing tendency to reduce forms which caused children to contract in the wanna contraction experiment produced an undesired result in the ECP experiment. The preference to reduce forms encouraged production of object extraction questions with no complementizer. Pilot work showed that instead of opting for production of questions like (3b), the majority of children chose to produce questions like (3a).
(3a) What do you think bugs eat? (4a) What do you think eats bugs?
(3b) What do you think that bugs eat? (4b) "What do you think that eats bugs?"

Children's preference for the question with no complementizer had the effect of eliminating the control for the target question in (4b). To compensate, I attempted to elicit an additional set of questions in which use of a complementizer is more favored. These were questions with an adverb placed directly after the verb, as for example, "What do you think really that bugs eat?". Children's ability to produce complementizers was also verified by eliciting an alternative structure in which complementizers are preferred, "Is it true that...". Using this combination of structures, it was possible to establish children's capacity to produce complementizers. However, since it turned out that in most cases children prefer to delete complementizers, it was not possible to show that children override a preference to produce them, and override this preference in order to satisfy the ECP. Nevertheless, as will become clear, this experiment was instrumental in providing insight about children's knowledge of the ECP.

In the Crossover experiment, the control situation allowed either the bound interpretation in (5b), or the deictic interpretation in (5a) to be assigned to the Bound Pronoun questions, but the hope was that children would exhibit a preference for the bound interpretation.

(5a) Who_{1} \textit{thinks} he_{2} has a hat?  (5b) Who_{1} \textit{thinks} he_{2} has a hat?
(6a) Who_{1} does he_{2} think \textit{he} has a hat?  (6b) "Who_{1} does he_{2} think \textit{he} has a hat?"

The preference for the bound interpretation in Bound Pronoun questions emerged in some children, but not in all children. Because it was necessary to establish that, at the very least, children allow the bound interpretation of pronouns, another set of questions was introduced. In these questions, the context did not offer a choice of interpretations, as in (5). In these supplemental controls, only the bound interpretation was made available. Pursuing the matter still further, it was possible to find a structure for which children preferred to interpret pronouns as bound pronouns. This was in so-called 'Sloppy Identity' sentences like "Snoopy thinks he has a hat and so does Donald Duck". These controls are discussed in detail in the section which describes the experiment on Strong Crossover.

Having stated the research strategy, let us turn to the experiments on children's knowledge of the three constraints.

**Experiment on Wanna Contraction**

In this research, children's adherence to the constraint on contraction across Wh-trace is tested by probing their knowledge of one relevant case, the wanna contraction paradigm, repeated in (7):

(7a) Who do you want to help?
(7b) Who do you wanna help?

(8a) Who do you want to help you?
(8b) "Who do you wanna help you?"

Children's linguistic knowledge of the constraint was tested using the technique of elicited production, as described below.

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54 The same preference to delete complementizers was true of long-distance questions elicited from adult controls.
Elicitation of Questions from the Wanna Contraction Paradigm

Subjects

A total of 26 children were tested in the experiment on wanna contraction. They ranged in age from 2.10 to 5.5. Fourteen of these children were used to evaluate the constraint on contraction across Wh-trace. These 14 children whose productions formed part of the analysis ranged in age from 5.5 to 3.6 (mean age = 4.5).

Experimental Design

Questions from the wanna contraction paradigm were elicited by engaging children in a game in which they asked questions of a rat puppet, "Ratty". Two experimenters were required for the game. In the game, one experimenter, a "grown up" explains to the child that she wants to play with the rat, but that it seems to be afraid of grown-ups. She explains that she has heard that the rat isn't afraid of kids, and would probably play some games, if the child would play too. This explanation gives children reason to act as intermediary in encouraging the rat to participate in a "guessing game" and a "choosing" game. The experimenter who is the "grown up" manipulates the toys in the games, and the second experimenter plays the role of the rat puppet. During the game, the rat and the grown up are separated by a barrier, so that the rat won't be scared by the sight of the grown-up. The child, seated to the side of the barrier, is able to see both parties, and ask the rat questions, directed by the grown-up in hiding. Setting the stage in this way was instrumental to the success of the game because it provided the child with a meaningful situation for asking questions.

The game began with several warm-up questions in which the experimenter had the child find out the rat's name, whether it was a boy or girl, where it lived, and so on. Once the child was comfortable asking questions, the target situations were introduced. Not every child produced target questions immediately in response to the experimenter's lead-in, and various protocols were developed to extract them. For example, if in response to the lead-in "Ask the rat who", a child had produced a question word alone, e.g. "Who?", the rat would follow by asking "Who what?", or "Excuse me?" to elicit a full question. This interactive style allowed children several attempts at producing the target questions. All questions produced in the session that were full sentences were included in the data analysis. Any target that was repeated was counted as two productions.

Materials

The object extraction questions permitting contraction that served as experimental controls were elicited using the following protocol:

Protocol for "Wanna" (Object Extraction)

Experimenter: The rat looks kind of hungry. I bet he wants to eat something.
     Ask him what.
Child: What do you wanna eat?
Rat: Do you have any pizza?

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30 Twenty one children of the 26 children were tested in 1988, and the results presented in Thornton (1988). Five more children were tested in 1990, and the results of the two sessions combined for data analysis. The additional children were tested in order to prepare tapes for judgment by independent parties.
Note that contraction of "want" and "to" is not relevant in the experimenter's lead in, since the 3rd person singular form "wants to" does not contract. Thus, it is not possible that the experimenter could be giving the child clues as to when, or when not, to use contraction. As an additional check on children's tendency to produce contracted forms, Yes/No questions with wanna were elicited which did not form part of the analyzed data sample. These were elicited as follows:

Yes/No Questions with "Wanna"

Experimenter: Ask the rat if he wants to play a guessing game.
Child: Do you wanna play a guessing game?
Rat: Sure

(9) Sample Targets Permitting Contraction.

What do you wanna eat?
What do you wanna play?

In addition, other questions were elicited if they could be worked into the game with the child.³⁶

The above targets in which contraction is permissible, were contrasted with targets in which extraction is illicit. Two different protocols were used for subject extraction questions.

³⁶ Some of the targets for the five children who were tested at a later time (Stephanie, Sammy, Ian S, Ben D and Sarah) differed slightly. Some of the questions that allowed contraction were not object extraction questions, but locative extraction questions with the verb put, such as "Where do you wanna put the umbrella?"

Protocol for "Want To" (Subject Extraction)

Experimenter: I think the rat wants someone to brush his teeth for him. Ask him who.
Child: Who do you want to clean your teeth?
Rat: You

The second method was designed to encourage children to go beyond the simple "Who?" and "What?" responses frequent in the young children's speech. This technique was in the form of a "choosing game". In this game, three toys were placed in the workspace, and the rat's task was to match each one up with one of three alternative actions described by the experimenter. The idea was that if there was more than one potential event that the child would realize it was necessary to ask a full question (instead of "Who?") in order to distinguish between them. This protocol proved to be very successful.

Complex Protocol for "Want To" (Subject Extraction)

Experimenter: In this game, there's a baby, a dog, and Cookie Monster, OK? And some different things are going to happen, and the rat gets to choose who gets to do those different things. Now, one of these guys gets to take a walk, one of these guys gets to take a nap, and one of these guys gets to eat a cookie. So, one of these guys gets to eat a cookie, right? Ask the rat who he wants.
Child: Who do you want to eat a cookie?
Rat: Cookie Monster

(10) Sample Targets Prohibiting Contraction

Who do you want to (help you) brush your teeth?
Who do you want to help you (eat the pizza)?
All sessions were audio-taped and transcribed. As a check on the accuracy of transcription, 4 people were asked to independently judge a sample. These results are described below.

Results

In order to check the accuracy of the author’s transcriptions, the author’s judgments were compared with the judgments of four linguistics students. A sample from five children of questions judged as “wanna” and “want to” by the author were audio-taped. Using a wave form editing program at Haskins Laboratories, a portion of each question was digitized. Only a portion of the question was digitized in order to avoid providing the judges with contexts that gave clues about the admissibility of contraction. In each case, the Wh-phrase preceding the “do you want” or “do you wanna” portion of the question was omitted, and except for the first consonant following “want” or “wanna”, the following VP was also omitted. The digitized portions of the questions from each child were then randomized and placed on audio tape for presentation. The judges heard 4 instances of what the author had judged to be contracted forms, and 4 that had been judged to exhibit no contraction for each child. The eight randomized utterances were presented twice. The purpose of the first presentation was to allow the judge to become familiar with the child’s voice. On the second presentation of the utterances, the judges were asked to make their assessment. Since the subject extraction utterances were the crucial ones, the judgments of these 20 utterances (4 from each of the 5 children) were compared for agreement with the author.37 Even judging these question fragments, in 16 of the 20 utterances, the judges were completely in accord with the author’s judgment. In 2 of the remaining utterances, one judge disagreed, in another, 2 judges disagreed, and in another, 3 judges disagreed. Put another way, of the total of 80 judgments made by the 4 judges, there were only 7 that disagreed with the author. It is worth noting that 6 of the 7 judgments not in accord with the author’s were all from the productions of one child. It may well have been that this child’s voice was particularly difficult to understand on tape. Overall, then, the judges were 91% in agreement with the author. With this preliminary precaution in order, the results can be considered.

As noted, the data from only 14 of the 26 children tested was used in the evaluation of the constraint on contraction. Only children who produced a substantial number of relevant questions were included in the data analysis. The criteria for inclusion in the data analysis was (i) production of two or more control questions with contraction, (ii) production of at least two questions in the test situation, and (iii) production of some contracted forms. Of the 12 children excluded from the analysis, 10 were dropped because they failed to produce enough relevant questions. These children either produced too few questions with contraction, or produced “other” utterances, such as “What would you like to eat?”, instead of “What do you wanna eat?”. The other two children were eliminated because they produced only uncontracted forms in both the control and target situations. It should be noted that no child whose data were eliminated from the analysis ever produced a violation of the constraint on contraction across Wh-trace.

37 Note that if a judge was not in agreement with a judgment on an object extraction question, this was not of crucial importance, since object extraction questions may take the form "wanna" or "wanna".
The 14 children whose data were analyzed all showed a strong preference for contraction. Sixty of the 68 (≈88%) object extraction questions elicited from these children exhibited contraction. Only one child, Sarah, did not show a strong preference for contraction. She failed to contract in 6/12 of her object extraction questions, and was thus responsible for 6 of the total of 8 questions with no contraction. The strong preference for contraction demonstrated in these children’s object extraction questions provided a solid base with which to contrast children’s subject extraction questions. These 14 children produced a total of 74 subject extraction questions. Of these, 69/74 (≈92%) had no contraction, in keeping with the constraint of Universal Grammar. Some examples of children’s contrasting productions in the control object extraction situation and the target subject extraction situation are given below:

(11) Comparison of Subject and Object Question Forms

What do you wanna play with us? (Amber 4;6)
Who do you want to help you?

What do you wanna eat? (Kelsey 4;4)
Who do you want to help you eat the pizza?

What did you wanna say? (Caroline 3;7)
Who do you want to take a nap?

What does the Smurf wanna do? (Gabriel 4;0)
Who do you want to drink the cranberry juice?

The six apparent violations of the constraint were produced by 3 children. One child, Katie M., produced 2 violations; and another, Sammy, produced 1 violation. These two children’s violations could be attributed to performance mistakes, but one child, Kelly M., produced three (3/6) illicit questions, contracting in the illicit environment 50% of the time. This child’s productions are not easily explained by the theory of Universal Grammar, which predicts that every child should obey the constraint.38 The data evoked from the children whose data was analyzed for evaluation of the constraint on wanna contraction is shown in Table 1 at the end of the section, and the data from those children eliminated from the analysis is shown in Table 2.

In conclusion, children’s adherence to the constraint prohibiting contraction across Wh-trace 92% of the time provides strong support for the constraint as a principle of Universal Grammar. The experiment also demonstrates that children as young as 2;10 can produce long-distance questions extracting from Infinitival clauses. As a final point, it should be noted that elicited production makes available a robust data sample which can be analyzed for children’s adherence to the constraint. This analysis is not possible using the little data that appears in children’s spontaneous productions.

38 It may be that Kelly M. didn’t interpret the situations in the story correctly, and as a consequence produced questions with a structure to which the constraint did not apply.
Experimental Studies on the ECP

Only one previous study on children's knowledge of the ECP took advantage of the *that-trace* paradigm. This was a study conducted by Phinney (1981), reviewed below.

Phinney (1981)

Although Phinney's research falls within the Chomskyan framework, she did not make the working assumption that Universal Grammar makes certain linguistic structures available in the absence of experience. She hypothesizes that only some structures are part of the 'Core Grammar' initially available to the child. In particular, she assumes that embedded S-clauses are part of 'Core Grammar', but that S'-complements (which include a complementizer position) are not. On this view, the appearance of linguistic structures such as S'-complements lies outside Core Grammar and must be instantiated by positive data. This leads to the expectation that early grammars should exhibit evidence of embedded S-clauses but not embedded S'-clauses. This would mean that any child who had not acquired S'-complements would not have acquired complementizers such as *that*. If so, children's knowledge of the ECP, as realized in the *that-trace* paradigm, is not testable. But once children have been shown to have acquired embedded S'-clauses, their knowledge of the constraint underlying the *that-trace* paradigm should emerge.\(^*30\) To accommodate these possibilities, Phinney's experiment had two parts. The first part served as a control to test whether chil-

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\(^*30\) Phinney (1981) assumes that the *that-trace* paradigm is a result of the Nominalization Island Condition (NIC), not the ECP. This makes no difference to the present discussion.