The development of a methodology to collect linguistic data.

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THE DEVELOPMENT OF A METHODOLOGY TO COLLECT LINGUISTIC DATA

A Dissertation Presented

By

MARGARET M. MEHTA

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

June 1975
THE DEVELOPMENT OF A METHODOLOGY TO COLLECT LINGUISTIC DATA

A Dissertation

By

Margaret M. Mehta

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March 1975
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The Women's Movement, a long overdue revolution, has and continues to provide a necessary support for me and many other women. Until the diversity of facts about women became clear as a result of the Movement, women, including myself, felt isolated and unaware of the needs, frustrations and hopes of other women. We are increasingly becoming a resource for each other in educational pursuits and other ventures.

My husband, Surinder, has been an ever present supporter of my efforts to explore and acquire intellectually challenging professional interests not only during but prior to the impetus of the Women's Movement. This has required examination of and changes in his own self-concept and role to enable him to creatively contribute to a liberated household which is so very necessary for joint participation in the world inside and outside of the home. He also contributed in a variety of ways to my thinking in regard to the dissertation.

The others who have made important contributions in making it possible for me to work on this dissertation with greater comfort and support include my step-daughters, Jaya and Sheila; Helen May and her family, who helped in caring for my son Aneil; and finally my typist, Adam Sacks, who did a competent and dedicated job.
The Development of a Methodology to Collect Linguistic Data (June, 1975)

Margaret M. Mehta, M.S., Vanderbilt University

Directed by: Dr. Thomas E. Hutchinson

ABSTRACT

This study, the theoretical development and field testing of a methodology to collect linguistic data, is based on the assumption that "... a systematic, operationalized, standardized set of rules and procedures designed to accomplish a defined purpose" is needed. The purpose is to provide methodologically generated linguistic data to confirm or cast doubt upon theories or hypotheses about language. To accomplish this purpose the Mehta Formula #2 is devised as the means of constructing an interview, a particular means of collecting linguistic data. This Formula within Mehta Methodology to Collect Linguistic Data, the Methodology itself, and an interpretation of the collected data are the products of the investigation. The Formula and the Methodology represent prescriptive requirements for the solution to the problem of the paucity of testing of theoretical positions about language based on methodologically generated data. The interpretation of the linguistic data, a particular type of ambiguity, lends support to previous research in language acquisition.

Chapter I is begun with a brief introduction to the study of language followed by a statement of the problem of the investigation.
The next section begins with a critique of some of the literature on language acquisition as background for the investigation. Much of the literature is on children under 5 years of age. However, the children in this investigation are beyond 5 years of age which has often been considered to be the cut off point for language acquisition. The reason for studying older children is that Carol Chomsky has presented not only the notion but the evidence that such children are acquiring language well past 5 years of age.

A brief presentation of considerations of the theoretical framework of linguistics as it relates to the exploratory research undertaken in this dissertation is made. The work of Noam Chomsky and many who have developed and extended his ideas provides the theoretical basis of linguistic competence for this investigation which focuses on a particular aspect of ambiguity.

Chapter I is concluded with the rationale for the selection of Metamethodology, a methodology to develop methodologies. Metamethodology is applied to develop a methodology to collect valid linguistic data.

Chapter II provides the step by step process toward the development of Mehta Methodology to Collect Linguistic Data, along with the resulting product, Drafts I and II of it. This documentation provides the reader with the means of reaching an understanding of the rationale for the steps as they were progressively taken. The first Draft is arrived at abstractly, the second one is developed after the pilot test of Draft I.
Mehta Methodology can be used within any number of academic disciplines, and it is general enough to be applied by researchers who represent varied viewpoints within any given discipline. Yet the Methodology is specific enough to enable the researcher to make sure that the linguistic data which are collected meet certain required criteria.

The linguistic data, organized by certain variables, analysis and interpretation of these data, and the recommended changes in Mehta Methodology resulting in Draft III, comprise Chapter III. Field testing allowed for an improved draft of Mehta Methodology. This, however, is not considered to be the final draft. This research has been an investigation of language which provides only a beginning in the development of a Methodology to collect linguistic data. However, even in the application of this early development of the Methodology, linguistic data are collected which are related to abstract linguistic theory of competence on ambiguity.

Because of the dual purpose of the dissertation, to develop a Methodology to collect linguistic data and to actually collect linguistic data, both areas are given attention in Chapter IV. The contributions of this dissertation are in the development of a Methodology and a rigorous formula which enables an investigator to collect linguistic data for the investigation of a particular type of ambiguity. The resulting methodology is generalizable enough to be used in a variety of academic disciplines concerned with the in-
vestigation of language. In this investigation the linguistic data provided a basis for tentative generalizations regarding the temporal or sequential acquisition process of a particular type of ambiguity. Finally, ideas for additional research in this area are suggested.

The dissertation is concluded with a Chapter on the educational implications of both linguistics and of the particular methodological and substantive results of the investigation.
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CHAPTER I

INTRODUCTION AND CONSIDERATION OF THE PROBLEM

A

Introduction to Linguistics

Some people have accepted language in their repertoire of skills without curiosity or questioning. However, there have been others in many cultures and for hundreds of years who have examined and questioned language from a variety of perspectives. The earliest and also a highly advanced study of language was done by scholars in India. European philology or the study of language, begun over 2,500 years ago, focused both on language structure and use. The source for background information on linguistics is all from the same source (19).

In the early modern period of the study of language the emphasis was on the following:

1. theoretical notions regarding rational structure of language;
2. the place of language in education; and
3. the place of language in human life.

By the nineteenth century the orientation for philology had shifted to areas which are indicated briefly:

1. the use of a historical method of study was applied to Indo-European languages;
2. an anthropological approach to the study of language was
begun;

3. linguistic geography and dialectology were investigated;

4. the cognitive import was sought in an evolutionary typology of languages in general linguistics; and

5. the study of sound patterns of languages was explored with the misconception that phonetics was a natural science.

By the beginning of the twentieth century some shifts in interests can be observed and after World War II, philology and linguistics became distinct in meaning. At this point, linguistics was the term for the study of language. Dell Hymes makes distinctions in the approaches to the study of languages which are helpful:¹ "... the science of language is linguistics proper, and the study of language may be called the field of linguistics."

Some of the characteristics which have been observed in this century are:

1. a switch from historical to structural interests in language. The interests of structural linguists have been with phonological and grammatical analysis; the search for general laws through the examination of phonological typology; the study of diffusion of linguistic features and an analysis of social and poetic varieties of language.

2. De Saussure introduced the distinction between "la langue" and "la parole." "La langue" is the underlying system and

social fact of language to be investigated by linguists. "La parole" is various aspects of speech and other uses of language.

Several models for the investigation of language have evolved in this century. Of these, transformational generative grammar, proposed by Noam Chomsky is presently the most important one in the United States and abroad. Parts of the summary of the Chomskyian model by Hymes will be drawn upon for a brief presentation of this approach to language.¹

The true goal of linguistics should be explanatory adequacy; linguistics should characterize the nature of the equipment by means of which a child acquires such knowledge. To achieve the normal yet nearly miraculous result of an infinite capacity from a finite experience in but a few years, a child must be presumed to apply actively a native endowment, formulating theories to account for and go beyond the speech he hears. The rapidity and accuracy of a child's success, no matter what the language, indicate that all languages are of only one or a few fundamental types and that the contribution of the native endowment must be great....

The focus of linguistic theory is thus reformulated as linguistic competence, the knowledge of the ideally fluent user of language in an ideally homogeneous speech community. Theory is completed by an account of linguistic performance, comprising the various conditions--psychological, occasional, social--that modify and affect the expression of underlying competence.

¹Ibid., p. 357.
Statement of the Problem

Psycholinguistics has evolved as one of the several academic disciplines in the study of language. The task of psycholinguists has been defined by many as that of testing the theoretical notions set forth by generative grammarians, based on performance data. The means of accomplishing this task has been fraught with difficulties. The primary problem is related to the fundamental assumptions regarding language as set forth by generative grammarians. These linguists theorize that language competence or knowledge and performance are separate. That is, what a speaker knows about the language cannot be deduced from a particular utterance which is based on many factors which contribute to communication. However, an investigation of language must incorporate the means of addressing both theory and the actual use of language. While the linguist has been concerned with the abstract form of language, the competence of the speaker listener, through theory development, the psycholinguist must use such theory not as a model for performance but as a means of or as clues for tapping the basis for a theory of a language performance. The efforts should ultimately provide for a performance theory.

With a background of the dilemma as encountered by these researchers, the question arose--how to approach an investigation of performance within the transformational generative grammar framework. Returning to psycholinguistic research, the fundamental criticism
of it in regard to the investigation of language acquisition has been essentially in regard to the process of this research. For example, the researcher has not usually devised the means of assessing the speaker's abstract knowledge of the particular focus of the language under investigation. Thus it appears that the process or method of carrying out the research must be the requisite focus for the means of relating performance data to competence theory.

The problem of this investigation. Since process or method is of fundamental importance in the study of language, one purpose of this study has been to develop and field test a methodology to collect linguistic data, one which will incorporate the means of taking into account competence theory in the collection of linguistic data. The closely related purpose has been to collect, analyze and interpret linguistic data.

In the remainder of this Chapter the "Critique of some Studies on Language Acquisition" provides an introduction to the substantive topic to be investigated. This is followed by "Theoretical Linguistic Considerations" which specifies the fundamental ideas in linguistics upon which the research is based. Chapter I concludes with a section entitled "Methodology" which is composed of some general thoughts on this topic and the background for the development of the methodology for this investigation.
Critique of Some Studies on Language Acquisition

The acquisition of language has been investigated from a variety of perspectives. A theoretical framework of linguistics provides the background of the studies to be critiqued for this research. More specifically, it is generative grammar as originally interpreted by Noam Chomsky. A major focus of generative grammarians is taking into account what the speaker/listener knows about his/her native language. The following comments and statements summarize generative grammar, the idea of the knowledge of the speaker/listener (referred to as competence), and the investigation of language acquisition.

An interpretation of generative grammar is presented first.

...a "generative grammar"...means simply a system of syntactic, semantic and phonological rules that in some explicit and well-defined way assigns structural descriptions to sentences.... Nevertheless, a generative grammar is not a model for a user of the language, either a speaker or listener. The construction of a performance model based on the generative competence of the language user is a further task for the theorist and one that linguists share with their colleagues in psychology. (29, p. 4)

Menyuk addresses the issue of the competence of the language user.

The goal of linguistic descriptions is to describe the linguistic competence of the language user. That is, linguists attempt to describe all the generalizations about the language that the native speaker has knowledge of and uses to derive the meaning of an utterance and to express intended meaning. This knowledge or competence is reformulated by writing the grammars of the languages which consist of structural descriptions of the possible sentences of the language. These are models of possible sentences not descriptions of sentences in a language corpus. (27, pp. 1, 2)
Finally, in another statement, Noam Chomsky considers the
challenge of investigating the grammar of children (11, p. 39).

My feeling is that...only experimentation of a fairly
indirect and ingenious sort can provide evidence that
is at all critical for formulating a true account of the
child's grammar (as in the case of investigation of
any real system). Consequently, I would hope that some
of the research in this area would be diverted from re-
cording of texts towards attempting to tap the child's
underlying abilities to use and comprehend sentences,
to detect deviance and compensate for it, to apply rules
in new situations, to form highly specific concepts from
scattered bits of evidence, and so on.

Psycholinguistic\textsuperscript{1} studies of language acquisition. In a re-
view of the psycholinguistic literature based on generative grammar,
the problem areas which are described and considered are:

1. the methodological\textsuperscript{2} approach for valid linguistic data
collection; and

2. the lack of accounting for what knowledge the speaker has
of his/her language.

Some general characteristics of the studies will first be de-
scribed and considered within the framework of methodology as defined

\textsuperscript{1}(T)he study of linguistic behavior as conditioning and con-
ditioned by psychological factors including the speaker's and hearer's
culturally determined categories of expression and comprehension."
From Philip Babcock Gove, ed., Webster's Third New International

\textsuperscript{2}"... the word methodology is defined as a systematic, opera-
tionalized, standardized set of rules and procedures designed to
accomplish a defined purpose." Thomas E. Hutchinson, "Some Overlooked
Implications of the Purpose: To Provide Data for Decision-Making"
(Amherst, Mass.: University of Massachusetts, undated), 1.
earlier. Many of the studies are based on observations of utterances of young children. Many of the studies were performed using a very small sample of approximately the same age which was observed over a period of several months (2, 4, 5, 6, 8, 17, 22, 28). Other studies are based on the utterances of children of varying ages which included several months at the lower end of the age range to several years for the 5 to 17 years age range (7, 9, 16, 23, 28). Both types of studies represent attempts on the part of the investigators to provide data and analysis of language as it develops. Some researchers vary the environmental contexts to obtain data on particular types of syntactic structures¹ (7, 8, 9, 23, 28). The contextual environment differs according to the goals and purposes of the particular investigation. For example, Labov places a strong emphasis on sociological and psychological contexts and considers them essential factors in corroborating the types of utterances obtained on a primarily Black population.

A contrived test type situation is the approach of other investigators. For example, in one study the researchers anticipate the kinds of utterances to be elicited. The subjects are given pre-arranged specific tests which evoke certain types of responses (17). The type of utterances sought depends on the particular focus of the

¹"Syntactic structure is basically a by-product or derivational process of a productive grammar which generates sentences rather than lists them." From Roderick A. Jacobs and Peter S. Rosenbaum, English Transformational Grammar (Waltham, Mass.: Blaisdell Publishing Co., 1968), 279.
investigator. For example, Cazden is interested in only a particular aspect of syntax, the pattern of use of rules for inflections of nouns and verbs (7). Others attempt to write a grammar (generalizations about the language) based on a collection of all the utterances within a specified period of time. In another study, Brown and Fraser collect all of the utterances of one child over a period of twenty-six hours. These researchers then try to formulate a grammar based on that total collection of utterances (4).

To generalize, the methods of the investigators include variations on the length of time over which the linguistic data are collected; the spontaneous as opposed to the stimulus-response paradigm as the means of eliciting utterances and finally the checking system of determining the validity of the linguistic data or knowledge that the speaker has of his/her language. Variations of these approaches have allowed some researchers to describe prerequisites for the stimuli necessary for language acquisition or to interpret or to describe the amount of acquired language.

Presumably these methods are field tested so that researchers can generate knowledge about language acquisition. Yet these studies do not provide the reader with adequate information on either the experimental methods used or the field testing strategy.

The process of generating knowledge, a slow one in the best of circumstances, is particularly difficult in as complex an area

1Syntax is the application of a rule system to words or the lexicon to build a string or a sentence.
as language acquisition. The need for a methodology in the investigation of language acquisition appears to be a basic prerequisite for a systematic production or generation of knowledge in this area.

Further, in almost all of the studies, data are used on which there is the failure to build in a means of determining the speaker's knowledge of his/her own utterances. The exceptions are in the studies by Labov and Carol Chomsky (23, 9). The idea of an individual's knowledge of language can be briefly described using the field work approach of anthropologists. The anthropologist is exposed to a foreign language and attempts to learn and check the process by writing a set of rules or generalizations based on observations of the utterances. (S)he then tests these rules by composing sentences and asking a member of the language community to confirm or reject the opinion that such sentences are acceptable. The speaker of the community does not have to know why a particular sentence is acceptable or unacceptable. It is the speaker's unconscious or intuitive model of the language that the anthropologist seeks. The linguist calls the unconscious model the speaker's linguistic intuition or knowledge of the language. In the absence of the actual system of a speaker, a rule system stands as hypothesis about the data upon which it is based. If the knowledge a speaker has of his/her language is not considered, then it is possible that much data cannot be interpreted with impunity.

When the researchers do not take into account the unconscious
model of language, problems in the interpretation of the data can arise. Consider, for example, the early language of children under three years of age. It is not surprising to find researchers who project the intended meaning communicated by the child without making verifications of such a hypothesis. The need to validate the linguistic data is ignored by many, either in their own work or in the comments on research of others (4, 5, 6, 7, 8, 13, 16, 17, 18, 22, 25, 26, 27, 28). Yet to assume that interpretations can be derived from data on which no validation checks are made can lead to faulty conclusions.

It would also seem logical to know more about the language that is acquired before attempts are made to find out the effect of the characteristics of the language to which the child is exposed during the acquisition process. That is, we must first determine the rules or generalizations of the child's language. Follow by this step should be an assessment of the child's use of the language to which (s)he is exposed.

Carol Chomsky's research is the major exception to the generally faulty research methods used in syntactical language acquisition investigations. Aware of the difficulties of assessing syntax of children under five, she selected a population of five to ten year-olds for investigation. In her study on syntax there is evidence of various means of checking the utterances of children. First, she states the theoretical linguistic interpretations of complexity of the syntactic structures given. From the theoretical inter-

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1Jean Berko's research is excellent work in phonological language acquisition.
pretations she hypothesizes what the effects will be on the actual utterances of five to ten year-old children. An interview is developed and used which incorporates a means of checking the children's intuitive knowledge of the collected utterances. The linguistic data are analyzed descriptively. McNeil summarizes some of this research (26, pp. 99, 100).

Carol Chomsky...was interested in how children older than five understand sentences that depart from what she calls, after Rosenbaum (1967), the "Minimum Distance Principle" (MDP). The MDP is a general characteristic of English predicate complements. In John required Mary to be an enthusiast, for example, the subject (Mary) of the complement (to be an enthusiast) is the first (noun phrase) NP to the left. This rule is the MDP. However, in John promised Mary to be an enthusiast the MDP does not apply, for the subject of the complement is John----i.e., the second NP to the left. Promise is one of a small number of exceptional English verbs where the MDP is required not to apply. Another such verb is ask: compare I asked Mary what to do about the enthusiast to I told Mary what to do about the enthusiast. In the second the subject of do is Mary, as required by the MDP, but in the first, it is I.

Sentences with promise and ask are more complex than sentences with know or tell. To understand them a child must not only be able to recognize that the complement has a hidden subject but also that the subject is--in contradiction to a general rule--the first NP of the main clause. Inasmuch as it takes time for children to restrict general rules in the acquisition of language, we would expect them to apply the MDP before they discover the exceptions to the MDP.

Carol Chomsky adapts a number of experiences familiar to children, making them the content of a conversation or interview with them. Then the mistakes become the data for interpreting the child's grasp of the syntax.

When told to "ask Mary what to feed the doll" a child who knows the MDP but not that ask is an exception should say
something like what are you going to feed the doll--not what should I feed the doll. Similarly, if asked who will do the feeding in John promised Mary to feed the doll, a child who knows the MDP but not that promise is an exception should say Mary. Such confusions are exactly what Chomsky found.

The course of acquisition is interesting. In the case of promise all children above five know about the MDP. Some as young as five also know that promise is an exception to the MDP while others as old as ten do not. There seems to be no age at which all children discover that promise requires the MDP to be violated. A similar history exists for ask in that again there is no age by which all children acquire full knowledge of how to use the verb. Some as young as five never make mistakes, others as old as ten always make mistakes. The situation with ask, however, is more complicated than with promise, because at first, children interpret ask as tell. In response to the instruction (in the interview) a child may tell Mary what to put in the box--a doll, for instance. In this case, the MDP is applied, but because the child has interpreted ask as tell, there is no reason it should not apply. Only later do children actually ask a question when instructed in this way, and then it is possible to observe incorrect applications of the MDP--"what are you going to put in the box?"

These checking techniques are not particularly sophisticated but the use of such procedures in a linguistic investigation is unprecedented. C. Chomsky's systematic study is an ingenious strategy for tapping linguistic knowledge or competence. Her study provides clear evidence that techniques can be devised as a basis for determining linguistic competence.

Although the research of C. Chomsky represents an important step, the means of collecting linguistic data is not used within the framework of a methodology. Although she has used original means to collect the data, these techniques were not addressed methodologically (as defined earlier by Hutchinson). To build upon this
interview strategy one must infer and interpret many things which were done. However, these and other techniques can only be devised and built upon through the recognition of a need for them and in systematic development of their application. This is possible through the development of a methodology. (There is no documentation of a research methodology either in her text, "The Acquisition of Syntax in Children from 5 to 10," or in the dissertation on which the text is based.)

Before going into further detail in the considerations regarding methodology, the area of generative grammar theory will be introduced to provide some background for the reader as it relates to this investigation.

D
Theoretical Linguistic Considerations in Generative Grammar

An original notion of linguist Noam Chomsky is that our understanding of language is based on its abstract characteristics. This includes the way in which language is generated. This idea is embodied in what is called generative grammar (12). Since the initiation of this approach for the examination of language, he and his colleagues have collaborated in the development of theories regarding the abstract nature of all languages.

A basic consideration in these ideas is the observation that the speaker can generate an infinite number of sentences based on a finite set of data. That is, as a speaker/listener learns and
uses a language there is a constant creation of novel sentences which are grammatically correct although he/she has never heard them before. A variation of this idea is that the language that we use can not be spoken and understood simply on the basis of the surface characteristics of the well formed sentences that are exchanged and assumed by many to be the entire set of data necessary for this process. Some of the characteristics a speaker/listener must have to support these notions will be considered.

In order for the speaker/listener to be able to generate an infinite number of acceptable sentences, the detection of unacceptable sentences must be possible. A sentence is a structured string of words. Deviations from the prescribed pattern are easily recognized. No previous exposure to a particular sentence is required to determine whether that sentence is acceptable. Thus it is assumed that a speaker has internalized the rules of his/her language. This means that the speaker is able to make an assessment of the acceptability of an infinite number of sentences. For example, the following sentence is recognized as acceptable:

(1) the trains are most crowded during the holidays.\(^1\)

The speaker has no difficulty in excluding the following string

\(^1\)Examples (1)-(8) will be familiar to linguists. They are taken from Roderick A. Jacobs and Peter S. Rosenbaum, *English Transformational Grammar* (Waltham, Mass.: Blaisdell Publishing Company, 1968).
from the category of acceptable sentences:

(2) *holidays the during crowded most are trains the.\(^2\)

Another ability that the speaker/listener must have is the ability to detect ambiguity. For example, ambiguity can be noted for a single word:

(3) the police station was right by the bank.

The syntactic structure of the sentence may also be the basis for sentence ambiguity:

(4) the lamb is too hot to eat.

Here we know that the meaning can be that the lamb can be so hot that for the lamb, to eat is not possible or desirable. In this instance the lamb is the subject of the sentence. Also an unknown person can be the subject who finds the lamb impossible to eat because it is too hot.

The speaker also knows that sentences can have synonymous meaning. This is because sentences can be lexically or syntactically synonymous. This is made possible either by the substitution of different words or by structural differences. The following are examples of syntactically differing but synonymous sentences:

\(^2\)The star indicates an unacceptable sentence.
(5) a. Scintillate, scintillate, diminutive asteroid,
    How I speculate as to your identity.

    Twinkle, twinkle, little star,
    How I wonder what you are.

b. six out of seven salesmen agree that walruses have
   buckteeth

   that walruses have buckteeth is agreed by six out of
   seven salesmen.

What else can be said about the speaker's knowledge of the
language? The speaker knows that sentences are a structured string
of words which can be categorized into natural groups which are
called the constituents of a sentence. One way in which this de-
scription can be demonstrated is in a tree diagram.

(6) this human language reveals a systematic property

```
   S
  /   \
/     \
this human language  reveals a systematic property
```

The constituents can be divided further. A complete set of con-
stituents for this sentence follows.

```
   S
  /   \
/     \
this human language  reveals a systematic property
             /   \
            /     \
       this human language  reveals a systematic property
                        /   \
                       /     \
            human  language  a systematic property
```

The speaker/listener is also able to understand a sentence even when it does not appear to provide all the information that is required:

(7) the papers refused to report the trial because they were afraid to.

This sentence means and is interpreted as the following sentence:

(8) the papers refused to report the trial because they were afraid to report the trial.

These sentences don't appear to be the same. But yet they have the same meaning. They are in fact different on the surface structure level but because they have the same underlying deep structure they have the same meaning. All sentences have both a deep structure and a surface structure. The surface structure is the representation of the input to the phonological component of the grammar after all syntactic rules have been applied. Therefore the surface structure is roughly the pronounced or articulated form used to convey the meaning of the underlying structure of the sentence.

The means of relating the deep structure of a sentence to its surface structure is through transformations, the transforming of one constituent structure to another. Intermediate structures between the deep and surface structures are produced by the required transformations used to relate deep and surface structures.

Before returning to ambiguity and some specific examples which are to be used in this investigation, let us first look at some
additional characteristics of the underlying structure which are demonstrated in the tree form. As indicated the sentence is broken down into a number of parts, identified as constituents. Several of these constituents will be identified at this point, but because the rationale for these classifications is not germane to the topic, they will not be explored. The types of constituents which will be used in the description of underlying structures are noun phrase (NP), verb phrase (VP), and noun (N).

Next another type of ambiguity will be considered. This will be revealed in the way in which certain unambiguous sentences relate to ambiguous ones. The strings used in this explanation are to be used in this investigation. The following unambiguous sentences are described in tree diagrams below:

(9) flying planes is dangerous\(^1\).

(10) flying planes are dangerous.

\begin{diagram}
\begin{tikzpicture}
  \node (s) {S}
  \node (np) [below left=1cm of s] {NP}
  \node (vp) [below right=1cm of s] {VP}
  \node (2) [below of np] {2}
  \node (plane) [below of np] {flying of the plane}
  \node (danger) [below of vp] {is dangerous}

  \draw (s) -- (np);
  \draw (s) -- (vp);
  \draw (np) -- (2);
  \draw (np) -- (plane);
  \draw (vp) -- (danger);
\end{tikzpicture}
\end{diagram}


\(^2\)The diamond indicates that the constituent is not broken down as far as is possible. A more complex representation is not relevant to this discussion.
Now consider the next sentence, which is ambiguous:

(11) a. flying planes can be dangerous.

This sentence is ambiguous because it is possible to interpret "can be" as either singular or plural. The following sentences are also ambiguous for the same reason:

(11) b. cooking apples can be delightful.

c. hitting boys can be dangerous.

d. burning wood can be dangerous.

One additional thing needs to be added concerning these examples. When the examples of (11) are in a text there is no stress pattern provided. However when they are spoken, contrastive stress patterns are used. That is, using (11) b. as an example, either of the words can receive the greater stress. If cooking is given the greater stress then it is an adjective in a compound noun. However, if apples
receives the greater stress it is a verb in a noun phrase. Finally, if equal stress is given to the lexical items outside of the verb phrase, then the sentence is ambiguous.

It is theorized within the framework of generative grammar that the speaker/listener understands sentences presented in (9) and (10) in the abstract form as indicated in the tree diagrams. Understanding of sentences as provided in (11) when the lexical items outside the verb phrase are given equal stress is ambiguous requiring the choice between two options, either the underlying structure such as in the tree for (9) or (10).

With these various theoretical assumptions in mind the reader is asked to relate them to ideas regarding the use of these sentences in an exploratory investigation on language. For example, if an adult is provided with one of the sentences of (11) and asked to "tell the meaning of it," it is assumed that the responses reflect the theoretical assumption regarding the possible abstract underlying structures as presented for sentences (9) and (10).

Let us also imagine that an adult is presented with only two words and asked "to explain the meaning by putting them into a sentence." Examples of these follow:

(12) a. rolling balls.
    b. ringing bells.

Here again it is assumed that of the possible choices, two which could be made would include the same type of underlying struc-
tures as for sentences (9) and (10).

Further, suppose that a real person is presented with sentences such as (9) or (10) but without the singular or plural form. The person is then asked to decide whether the use of "is" or "are" is appropriate; or if both are possible. It is again assumed that adult English speakers would, with little hesitance, choose the latter option which would reflect an acceptance of the underlying structures for (9) and (10).

Finally using linguistic theory, the methodologist does not theorize the same ability or competence for children as for adults. Just what actually obtains at various points in the process of acquiring the knowledge of the particular types of ambiguity which has been discussed is unknown. Making an investigation in this area of ambiguity might well provide the basis for tentative theorizing regarding the abstract nature of language in the acquisition process.

In summary, some background regarding linguistics within the framework of generative grammar as developed by Noam Chomsky and his collaborators has been presented. Certain theoretical constraints have been defined and described in reference to a particular aspect of ambiguity. These suppositions provide the basis for this exploratory investigation in generative grammar.
Methodology

Some opinions and background information will provide an introduction to the idea of methodology. The basis for and the actual development of a methodology will follow in the next Chapter.

The lack of the use of a methodology in the investigation of language acquisition was pointed out and discussed earlier in this Chapter in the critique of the literature. Most of the studies were based on the application of the scientific method. While this approach has stood the test of time and is consequently highly valued in the scientific community, it is a method in contrast to a methodology. The difference between method and methodology is discussed by Thomann in his dissertation (31). Some of his ideas on this topic are presented below in outline form.

**Method**

- General sense of purpose.
- Descriptions of or guidelines for rules and procedures.
- Often a solution to non-generalizable problems.
- No documentation of the process.

**Methodology**

- Well defined purpose.
- Operationalized rules and procedures.
- An abstract but operational solution to a class of problems.
- Documentation of the process.

It is also interesting to note that the absence of methodology is not unique to this particular area of investigation. Observations indicate that methods are not only the usual approach applied
in academic fields but also in applied areas as well. Consider for example the training of professionals in such areas as teaching or clinical fields. The approaches used are still within the realm of methods. It appears to the author that this training has not yet been made abstract or generalizable enough to date. Consequently the purpose for training is also very likely not as clearly defined as it might be.

In an article by George Gallup entitled "Must Every Generation Learn From Scratch," he laments the fact that little use is made of the experience of others in many areas (15). Some examples he refers to are the lack of the availability and use of experiences from one generation to another, in the formation of businesses, city management, and the factors which contribute to happiness throughout the world. His thesis is that we must collect data which will enable us to build upon the experiences of others. He suggests many benefits of doing so, and questions why it has not been done in so many instances. While no one would disagree with the interest and intent of Gallup, what is needed is a methodology to accomplish the purpose. The means to tap the experiences of others, a potential natural resource, could provide much for us all and to the field of social science.

A lack of methodologies appears to be pervasive. Where can one turn to discover an actual application of a methodology? The computer print out is a marvelous example of the results of what can be considered a methodology. The benefits of the application
of a methodology reaped from print outs are known to those who have used them. The reader may consider the parallel of the computer material as inappropriate since its production is with equipment, not people. However, the development of methodology for the use of the computer is only as effective as the prescriptions that are given. This in turn is determined by the knowledge that is used and the way in which it is broken down. A computer can for example interact with individuals as has been demonstrated in client (person) / therapist (computer) conversations (35). Presently the conversation is pretty simplistic in contrast to the potential complexity of such encounters. However, ultimately computer-individual conversations can become considerably more complex as the knowledge in this area is expanded and the program instructions are improved.

Continuing with computer methodology, could it be replicated for other areas of human endeavor or academic spheres? Hutchinson, Fortune, Benedict, and Gordon have apparently considered this question and jointly worked to develop an evaluation methodology which is implemented by a person rather than by a machine (3). It is suggested that they considered the parallel, although it may not have been consciously compared by all of these researchers. (Most however have worked to a considerable degree with computers.) This is a methodology which has been in development for some five years. Not too long after its early stages of planning the idea of a metamethodology was conceived of as the basis from which evalu-
ation methodology and other methodologies could be generated.

Metamethodology, initiated by Hutchinson and Thomann, has evolved through informal application along with a field test of it (31). (Also see Appendix II-A, Metamethodology Draft VII.)

This author examined metamethodology and decided to apply it in the development of a methodology which would have to do with generative grammar and language acquisition.
CHAPTER II
THE DEVELOPMENT OF MEHTA METHODOLOGY

This Chapter is divided into two parts. The first is the initial application of Metamethodology which results in the first draft of Mehta Methodology to collect valid linguistic data. The second part continues with the application of the methodology which results in Draft II of Mehta Methodology. The final version of the methodology is in Chapter IV. Finally, the Chapter is summarized.

It may be helpful to the reader to refer to the complete form of Metamethodology in Appendix A for this Chapter before trying to follow the application of it. The reader should bear in mind that the development of a methodology by the application of Metamethodology includes the documentation of a number of steps which are in part circular. In using this process the methodologist is guided in making decisions which should ultimately provide for a logical procedure.

A
Application of Metamethodology

I. Put methodologist in contact with problem using one of two methods:

A. Simple method--use interests of the methodologist.

The methodologist's training and work in Audiology and Speech Pathology brought her to the point of realizing a need for study in the theory of language use. She explored research from a variety of
perspectives including education of young children, psychology, linguistics and psycholinguistics. Also the methodologist had been exposed to research techniques which she wanted to use to explore this language interest.

B. Not applied.\(^1\)

II. State the purpose by analyzing the area and determining a purpose that will solve the problem.

A. Investigate the problem area.

1. Read the literature in the area.

A summary of the literature in one aspect of language, the area of acquisition, reveals that many studies have been done within the last twelve years. Some of the methods and approaches of these studies were discussed in Chapter I. The research of these researchers reflects the goal of a theory of the performance of language. The stepping stones for the goal of a language performance theory\(^2\) are lacking. A major difficulty is the lack of valid linguistic data, that is, data which represent the intent or intuitive knowledge of the speaker.

\(^1\)The total sequence of Metamethodology could not be applied because of time constraints of the Methodologist or because it was not thought to be applicable. The number of the missing part will be indicated. "Not applied" will indicate an omission in the sequence of Metamethodology. See Metamethodology in Appendix III-A for the missing instructions.

\(^2\)This means a theory of the way in which language is produced and understood. The linguist in contrast is striving to achieve a theory of language competence. This is an abstract notion of the knowledge required to use a language.
In studying the grammar of adults to determine what is judged to be "acceptable," the adult can sometimes be questioned in a straightforward manner. In the investigation of the child's grammar, such a straightforward approach is not appropriate. As the grammar of young children was explored, the problem of the child's intuitive grasp of the language was given little attention by most researchers. The research of C. Chomsky is cited in Chapter I as a serious attempt to deal with a checking system to account for the validity of utterances of children. On the basis of the search of the literature, the methodologist decided that there is a need to develop a means to collect valid linguistic data.

2. Talk to people who work in the area.

The methodologist discussed the problem area with Linda Thomas.¹ Her acquaintance with much of the literature critiqued in Chapter I enabled her to relate this area of research to her theoretical background in linguistics. She is unreservedly convinced of the desirability of the investigation of the means of collecting valid linguistic data.

3. Examine work being done in the area.

As a result of a critique of the literature in the area, it is the methodologist's opinion that there is a need to ini-

¹Linda Thomas, Ph.D., Assistant Professor in Linguistics at the University of Texas, Austin.
tiate the development of a methodology to collect valid linguistic data. At this point Metamethodology was examined for its applicability for such an investigation.

4. **Not applied.**

5. **Try out tools that already exist in problem area.**

   Some two years ago the methodologist made an abortive attempt to investigate language acquisition. The approach attempted was simply to present stimulus material (sentences which included reflexive pronouns) to young children to determine their understanding of such linguistic structures. This appears to be the usual approach in the psycholinguistic literature which was critiqued. Some problems encountered in attempting this kind of research were both in trying to formulate the means of collecting valid data and in the total research design. Research in language acquisition is clearly lacking in a documentation of the actual interview procedures. Research designs are also often poorly articulated or too sophisticated for the basic research needed for the present state of the field.

B. **Narrow down area into manageable piece (focus).**

   The focus is the collection of valid linguistic data as it pertains to language acquisition.

C. **Investigate purposes within the chosen piece of the problem area.**

   1. **Not applied.**
2. Read the literature applicable to the chosen problem.

The idea of methodology has been summarized by James B. Thomann ("Metamethodology: An Overview of What It Is and How It Was Developed," Appendix II-B).

...a method is a set of rules and procedures that guide someone in doing some activity; other names for a method are "rules of thumb" or "guidelines" or even "an approach." A methodology, on the other hand, is a systematized, standardized, operationalized set of rules and procedures that are designed to accomplish a specific, well-defined route that accomplishes the purposes while the method only supplies an incompletely defined route that might be used. A method only supplies some direction to the user and leaves a lot for the user as far as procedures, sequence, etc., are concerned.

...Furthermore, a methodology can be looked at as an abstract but operational solution to a class of problems. It is abstract because it does not supply a specific solution to a specific problem but it supplies the means by which that specific solution is derived. It is operational because steps by which the solution is arrived at are as prescriptive as possible. In addition, we are dealing with a class of problems because any specific problem has particular characteristics that makes it similar to other problems and the steps are designed on the general problem. By accounting for the particular circumstances a specific problem is dealt with. It is in this way that a methodology is an abstract but operational solution to a class of problems.

3. Not applied.

D. Not applied.

E. Check chosen purpose against following two criteria:

1. Check purpose to see that it is not trivial.

Linguist Linda Thomas, in response to the consideration of whether or not the purpose is trivial, indicated her strong support for the purpose which she considers to be a fundamental
area of research.

2. **Check purpose to see that it really solves the problem you have in mind.**

   Until we can be assured of the validity of language data of young children, it will not be possible to develop a performance theory of language.

3. **Not applied.**

F. **Not applied.**

G. **Write out a purpose and commit yourself to it.** (If you can say why you don't like it, then revise and recycle to E. If you can't say why you don't like it, then go on to Step III.)

   The purpose is to collect valid linguistic data.

III. Test the purpose by the following criteria:

A. **Is purpose desirable?**

   1. **Use one of the following methods--where not obvious use Complex Method.**

      a. **Simple Method**

         i) **Answer question yourself with rationale.**

            A number of the desirable aspects of the purpose are listed.

            (1) Requires one to think about many factors before setting up research design.

            (2) Demands that the methodologist come to grips with the purpose.
(3) Facilitates the documentation of research efforts which can be available to a community of researchers. This allows for researchers to build upon one another's work both in regard to approach and results.

(4) Reduces potential frustration of individual methodologist. When an individual uses the notion of a methodology there can be a greater feeling of communication with one's colleagues who can also contribute to such efforts.

ii) Not applied.

iii) Check notes from previous literature review and check any other literature on the area to see if purpose is desirable.

This has been done (see Chapter I).

b. Not applied.

2. Not applied.

B. Not applied.

IV. Once all answers to III are yes, then analyze implications of the purpose for the development of methodology. (This is a way of identifying the attributes that the methodology must have.)

A. Use following method to analyze implications. (Hutchinson says "Problem implies its own solution." In this case, the implications of the purpose supply first approximation of gross methodological elements.)
1. a. Imagine and write down in what ways you could fail to accomplish the purpose.
   (1) The validity of linguistic data cannot be checked.
   (2) The methodology to collect valid linguistic data cannot be developed.
   (3) The collection of valid linguistic data does not lend itself to a methodology.

b. Imagine and write down in what ways you can accomplish the purpose, avoiding all problems.
   (1) Valid linguistic data are collected.
   (2) A methodology to collect valid linguistic data is developed.
   (3) The first step is made toward the development of a methodology to collect valid linguistic data.

c. Imagine the purpose being accomplished; write down what is happening.
   (1) Linguistic structure(s) for investigation are selected
   (2) Theoretical bases for structure(s) are determined.
   (3) Means of collecting valid linguistic data are formulated.
   (4) Rationale for means of collecting and classifying data is stated.
   (5) Population characteristics are determined.
(6) Pilot study is run.

(7) Changes in the means to collect valid linguistic data are made based on the pilot study.

(8) Investigation is carried out.

(9) Means of determining degree of corroboration for data classification technique is developed.

(10) Data are interpreted.

d. i) For each element determined through b + c, determine all possible alternatives to accomplish the purpose.

(1) Work of others is used in developing methodology. For example, in facilitating the selection of linguistic structure(s), population age, and structure, techniques of others are used to collect data.

(2) Linguistic data are clearly defined.

(3) Planning for methodology is clearly documented.

(4) Changes in methodological approach are listed and explained.

(5) The simplest means of beginning a methodology is determined.

(6) Problems in planning methodology are identified.

(7) Emphasis is initially placed on methodology
rather than the data collection as a means of strengthening the chances for reliable data in the future.

ii) Create one list from all the lists generated in the previous step. For those dimensions generated in a., change their statements so that they state a procedure or procedures to solve the problem they originally identified.

(1) State means of collecting linguistic data.

(2) Select linguistic structure(s) for investigation.

(3) Determine theoretical basis for structures to be investigated.

(4) Determine population characteristics.

(5) State rationale for means of collecting data.

(6) Run pilot study.

(7) Make changes in means to collect valid linguistic data based on pilot study.

(8) Carry out investigation.

(9) Work out means of determining corroboration for classification of data.

(10) Describe data.

(11) Interpret data.
(12) Methodology for the collection of valid linguistc data is reformulated based on experience of investigation.

iii) Not applied.

2. Choose the initial set of major processes for the methodology.
   a. Look over the list of dimensions and choose those which you feel will accomplish the purpose.
      All dimensions appeared necessary to accomplish the purpose.
   b. Combine together any dimensions that appear to go together.
      The list below demonstrates the way in which the dimensions are combined.
   c. Write out a new list with any combined dimensions listed together.
      (1) Develop an interview.
      (2) Pilot study the interview.
      (3) "evise interview based on the pilot study.
      (4) Carry out investigation.
      (5) Revise methodology to collect valid linguistic data.

B. Organize the attributes into a rational order of steps.

1. Determine which implications are not necessary for the methodology (accomplishing purpose) and strike them
from list.

2. **Determine which implications are contained in others and note that.** Determine which implications can be combined to make one step, and give those a name.
   a. **Combine any dimensions on the list which are related and define a single process when combined but are not logical substeps of each other.**
   b. **Create a major step naming this process and list the combined dimensions as substeps of this.**

3. **Ask which implication you would have to accomplish first in order to accomplish the rest.**

4. **Write it out as first step.**

5. **Ask which implication would now be first, given that the first one is accomplished.**

6. **Write it down as second step.**

7. **Do this process until all major implications are accounted for.**

8. **Order any substeps by cycling through 3 - 7.**

9. **Check to see if order has logical flow to it.**

10. **Check to make sure all implications are stated procedurally.**

11.-15. **Not applied.**

C.-D. **Not applied.**

E. **Write out a final list to be used throughout rest of methodology.**
(1.0) Develop an interview.
(1.1) Specify rationale for interview.
(1.2) Construct formula.
(1.3) Develop a format.
(1.4) Select linguistic structures to be investigated.
(1.5) Determine means of eliciting data.
(1.6) Determine basis for data classification.
(1.7) Determine degree of corroboration for data classification system.
(1.8) Determine population characteristics. Select sample.
(1.9) Determine interview environment. Arrange for interview environment.
(1.10) Operationalize or define the essential steps for the interview to be developed at this point.
(1.11) Pilot test interview.
(1.12) Relate and refine steps, as available time constraints allow.
(1.13) Redesign based on testing of interview as time permits.
(1.14) Operationalize those changes to be tested and/or run in investigation.
(2.0) Plan and run field investigation (interview).
(2.1) Determine population characteristics. Select sample.
(2.2) Determine interview environment. Arrange for interview environment.
(2.3) Collect data.

(2.4) Classify data.

(2.5) Determine degree of corroboration with data classification system.

(2.6) Interpret data.

V. Operationalize the purpose. (Only the first stage in the operationalization will be taken at this point.)

Purpose: To collect valid linguistic data as applied to Case I, language acquisition.

A. The straight analysis technique.

1. Identify the fuzzy concepts in the purpose.
   Collect; valid; linguistic data; language acquisition.

2. Directly operationalize each fuzzy concept.
   Collect means systematically assembling together. Valid means operationally defined requirements or procedures. Linguistic data are utterances or responses of subjects.

3. Directly operationalize the interaction among fuzzy concepts.
   To collect valid linguistic data is to assemble utterances which were collected using operationally defined procedures.

4. Test the criteria for completeness in a manner of your own choosing and revise them if necessary.
   A discussion with Tom Hutchinson provided a corroborative opinion on the use and results of Metamethodology thus far.

B.-D. Not applied.

VI. Design Procedures
A. **Identify the first (next) step to be designed (i.e., the first crucial step where it is not clear that the step would be easy to develop).**

The first step to be designed is the interview.

1.-5. **Not applied.**

B. **Identify the step's sub-purpose.**

The sub-purpose of developing an interview is to demonstrate a viable means of collecting valid linguistic data.

C. **Analyze implications of sub-purpose in terms of main purpose.**

a. **Use the following method to analyze implications of the sub-purpose.**

   1. a) **Imagine and write down in what ways you could fail to accomplish the purpose.**

      (1) Interview is impossible to devise.

      (2) Appropriate sample cannot be selected.

      (3) Linguistic data are not obtained.

      (4) Linguistic data are not available to classify.

   b) **Imagine and write down in what ways you can accomplish the purpose, avoiding all the problems.**

      (1) Interview is developed.

      (2) Interview proves applicable to a particular population.

      (3) Linguistic data can be classified.

      (4) Interview strategies can be related to a
methodology for the collection of valid linguistic data.

c) Not applied.

d) i. For each element determined through b + c, determine all possible alternatives to accomplish the purpose.

(1) Another method or model of collecting data is developed.

(2) Such a model is applicable to a particular population.

(3) Using such a model allows for data to be classified.

ii. Create one list from all the lists generated in the previous step. For those dimensions generated in a., change their statements so that they state a procedure or procedures to solve the problems they originally identified.

(1) Clarify and narrow down interview to allow for purpose to be accomplished.

(2) Simplify the requirements for the population to allow for accessibility of a sample.

(3) Determine why valid linguistic data are not obtained so redesign is possible.

(4) Continue with redesign until valid linguistic data are obtained.
(5) Classify valid linguistic data.

iii. Test the completeness of the above list by using one or more of the following methods to generate alternative lists of dimensions. Then examine these new lists. For each dimension not on the list produced in (d.ii.) above that you want on that list, add it to the list. Add any other dimensions to the list that you think of while doing this process which are not already on the list and which you want on the list.

1. Not applied.

2. Go back to list generated in b and c, and consider again whether any of those should be on list and add any new ones.

3. Ask yourself if your alternatives have any alternatives to them.

4. Ask what bad alternatives exist that are not on this list and how they could be changed to good alternatives.

5. Use the possible methodologies generated in Step III.D.

6. Use any other tests of your own choosing.
2. Choose the initial set of major processes for the methodology.
   a) Look over the list of dimensions and choose those you feel will accomplish the purpose.
   b) Combine together any dimensions that appear to go together.
   c) Write out a new list with any combined dimensions listed together.

b. Organize the attributes into a rational order of steps.
   1. Determine which implications are not necessary for the methodology (accomplishing the purpose) and strike them from list.
   2. Determine which implications are contained in others and note that. Determine which implications can be combined to make one step, and give those a name.
      a) Combine any dimensions on the list which are related and define a single process when combined but are not logical substeps of each other.
      b) Create a major step naming this process and list the combined dimensions as substeps of this.
   3. Ask which implication you would have to accomplish first in order to accomplish the rest.
   4. Write it out as first step.
   5. Ask which implication would now be first, given the first one is accomplished.
6. Write it down as second step.
7. Do this process until all major implications are accounted for.
8. Order any substeps by cycling through 3 - 7.
9. Check to see if order has logical flow to it.
10. Check to make sure all implications are stated procedurally.
11. Check completion of ordering by asking others (at least one) to give an ordering of implications with explanation of why, if possible, without showing them your ordering. This can be verbal or written, depending on the resources available.
12. Do a revised ordering based on responses from number 11.
13. Give revised ordered list to others experienced in problem area for critique.

The following methodology to collect valid linguistic data was developed and presented to Tom Hutchinson who found it to represent a logical sequence of steps to accomplish the purpose.

Mehta Methodology to Collect Valid Linguistic Data: DRAFT I

1.0 Select the case and modality for the collection of valid linguistic data.

1.1 Based on the interests and skills of the researcher, the litera-
ture should be searched to provide the background for this selection.

1.1.1 Case I: Language Acquisition
    Case II: Stabilized Language Community
    Case III: Dialect in Transition
    Case IV: Language Deterioration
    Case V: Miscellaneous

1.1.2 Modality:
    Oral, written or contextual.

1.2 Narrow the area down so that you have a manageable sub-area.

1.3 Analyze the chosen sub-area for other various possible focuses and combinations of case and modality.

2.0 Develop the experimental technique.

2.1 Explore alternative ways of investigating the methodology to collect valid linguistic data. Examples of ways for generating alternatives follow.

2.1.1 Use previous research on methodology to suggest alternatives.

2.1.2 Hypothesize that the reality of the data in the area to be investigated already exists. Examine the hypothetical data.

2.1.3 Create an off-beat approach that could lead to obtaining certain data.

2.2 Identify the critical requirements for the experimental approach. Examples of these are procedures for eliciting re-
sponses, identifying and classifying data, length and complexity of data gathering, appropriateness of approach to case, modality, and population variables and finally resources needed and available to accomplish the task.

3.0 Develop an interview to collect valid linguistic data. (Interview is the term used by this methodologist for the experimental approach to collect valid linguistic data.)

Interview

3.1 Plan and briefly describe steps required to develop interview.

3.1.1 Specify rationale.

3.1.2 Construct formula. (This step is optional.)

3.1.3 Develop a format.

3.1.4 Select linguistic structures to be investigated.

3.1.5 Determine means of eliciting linguistic data.

3.1.6 Determine basis for data classification.

3.1.7 Determine degree of corroboration for data classification system.

3.1.8 Determine population characteristics. Select sample.

3.1.9 Determine interview environment. Arrange for such an environment.

3.1.10 Operationalize or define the essential steps for the means to collect valid linguistic data.

3.1.11 Pilot test interview.

3.1.12 Relate the steps above to one another as much as time constraints allow.
3.1.13 Redesign interview within time constraints.
3.1.14 Operationalize changes to be used in formal test of interview.¹

3.2 Formally test the interview.
3.2.1 Determine population characteristics. Select sample.
3.2.2 Determine environment for interview. Arrange for environment.
3.2.3 Collect data.
3.2.4 Classify data.
3.2.5 Determine degree of corroboration with data classification system.
3.2.6 Interpret data.

3.3 Relate the experimental approach to the requirements of the methodology in order to collect valid linguistic data.


D.-J. Not applied.

[N.B. One may conduct a field test as well as running through VI by using the data obtained in the field test to help out in the development procedures.]

VII. Test and then revise the purpose and/or procedures if necessary.

The following is a summary of step VII of Metamethodology. The details of the work, found in the remainder of this Chapter, are on the development of Mehta Methodology to collect valid

¹See Interview-Ambiguity, developed through the application of Mehta Methodology to Collect Linguistic Data, Draft I. Appendix II-C.
linguistic data.

A. Field test the methodology.

1. Determine what is to be field tested--a part of the methodology or the entire methodology.

The methodologist decided to field test the experimental approach, the Interview.

2. Determine the simplest field test not already done on the subject of the field test.

No field testing of this approach had been done.

3. Write out the purpose (of the methodology of the part to be tested) and its operationalization.

The purpose of the methodology, in which the interview is encompassed, is to collect valid linguistic data.

4. Determine your goals for the field test. If this is not easy to do, use the Goals Process from the Fortune/Hutchinson Evaluation Methodology.

The goals of the field test are to develop a methodology to collect valid linguistic data and to actually collect such data.

5. Develop the measures for the field test from the operationalization of the purpose and your goals. If this is not easy to do, use the Measuring Process from the Fortune/Hutchinson Evaluation Methodology. This is interpreted to mean, develop the criteria for the means to identify and to collect it. This is done in the
development of the experimental approach which follows shortly.

6. Do the field test and carry through the observations. Pilot and Field Testing are described in Mehta Methodology to Collect Valid Linguistic Data: Draft II, to be described in detail.

7. Use the data to revise the methodology or the part by recycling to Step VI.

Draft III of Mehta Methodology, found subsequently in the next Chapter is based on the changes as a result of pilot and field testing.

An experimental approach, hereafter to be referred to as "The Interview," is the generic term for the experimental approach for collecting valid linguistic data. Interview-Ambiguity is a particular interview which obviously pertains to linguistic ambiguity. Both the Interview and Interview-Ambiguity are developed by the application of Mehta Methodology. Although it had not been formulated at this point, Interview-Ambiguity will be briefly characterized and described with the intention of providing the reader with a tangible referent for the subsequent documentation of the application of Mehta Methodology.

Interview-Ambiguity presented in part on tape and in part orally by an interviewer is composed of stimulus materials and directions which are presented to subjects in a prescribed manner. It is divided into several parts which have distinct purposes and varied stimulus
materials. The name of a part is sometimes indicative of a particular type of stimulus material. For example, not surprisingly, the part "Riddles" contains riddles as stimulus material. In contrast the name of a part might indicate a general process. The parts entitled "Exploration" are by inference and fact, named for a process utilized in this part. Finally, the stimulus materials, instructions and directions for the interview process served as the means to elicit responses from subjects. The classified\textsuperscript{1} responses serve as the data for analysis and interpretation. An example of a classification for a subject's response to specific stimulus material for each part will be given below.\textsuperscript{2} The parts are listed and described in the order of their presentation for Interview-Ambiguity.

**Example of Interview-Ambiguity.**

**Part:** Riddles

**Description of Stimulus Materials:**

There are nine riddles which incorporate some form of ambiguity.

**Example of Stimulus Material, Description of/or Actual Instructions**

\textsuperscript{1}A classification is a decision usually regarding the grammaticality of certain responses of the subject. It is based on specified criteria which will be presented at a later point.

\textsuperscript{2}These examples are not intended to be an explanation for the rationale or strategies for classifications. The process of arriving at the basis for classification, a complex one, will be described in the documentation of Draft II of Mehta Methodology.
and Child's Response:

(Child is initially instructed to explain why the riddle is "funny," why it seems to be a "good one," or why some people might think it's funny.)

Interviewer gives stimulus material:

How do you know clocks are shy? (Pause for child to respond.)

Interviewer gives answer:

They always have their hands in front of their faces.

Child:

Some children do put their hands in front of their faces when they're shy. That's just like a clock. The clock is not really shy though. Its hands are in front of its face to tell time.

Classification of Response:

This response is classified as correct because there is evidence in the response of two meanings of either hands or face.

Part: Questions

Description of Stimulus Materials:

There are four lexical or vocabulary items used as both adjectives and verbs in either sets of sentences.

Example of Stimulus Material Description of/or Actual Instructions and Child's Response:

(Child is asked to answer a question.)
Interviewer:

Do you think eating apples with a friend sounds like a good idea?

Child:

Sure.

Classification of Response:

This is classified as correct because there is no evidence in the response of confusion.

Part: Exploration

Description of Stimulus Materials:

Four lexical\(^1\) items, flying, eating, fighting and burning are each presented in potentially ambiguous sentences.

Example of Stimulus Material, Description of/or Actual Instructions and Child's Response:

Interviewer:

I'm going to say some sentences and I'd like for you to explain the possible meaning or meanings of each sentence. Remember how you explained the riddles? This time just explain the sentence I say.

Flying planes\(^2\) can be dangerous.

---

\(^1\) Lexical means "that part...of a linguistic form...[which] does not depend on its membership in a particular form class..." For example, eat, eats, ate, eaten, eating. From Clarence L. Barnbard, ed., The American College Dictionary (New York: Harper and Brothers, 1953), 701.

\(^2\) The underlined words indicate that an attempt has been made to give equal stress to these words.
Child:

They sure can be. I believe that.

Interviewer:

What do you believe?

Child:

Planes are dangerous to fly in.

**Classification of Response:**

Flying is classified as a verb. This classification is based on the use of fly as a verb.

**Part:** Expansion

**Description of Stimulus Materials:**

Two ambiguous strings or incomplete sentences.

**Example of Stimulus Material, Description of/or Actual Instructions and Child's Response:**

Interviewer:

This time I'm going to say only two words. I want you to use these two words and make up a sentence which will make the meaning as clear as possible. The words are:

**ringing bells**

Child:

Ringing bells is fun.

**Classification of Response:**

Ringing is classified as a verb because in the response there is reference to an action upon the bells.
Part: Exploration

(This is a repeat of Exploration as explained earlier.)

Part: Sentence Completion

Description of Stimulus Materials:

The stimulus materials are three sentences which include certain potentially ambiguous lexical items. The sentences lack the "to be" verb, is or are.

Example of Stimulus Material, Description of/or Actual Instructions and Child's Response:

After the child is given an opportunity for practice in filling in missing words in orally presented sentences, he/she is asked to complete the sentences which comprise the stimulus materials.

The first sentence is presented.

Interviewer:

Hitting boys ___ mean.

Child:

Hitting boys is ___ mean.

Interviewer:

You think it's is, not are?

Child:

Yes, of course it's is.

Interviewer:

Now, could you use is and also are too?
Child:

No sir. Just is.

**Classification of Response:**

*Hitting* is classified as a verb. The classification is based on the use of *is*.

**B**

Application of Mehta Methodology

Draft I of Mehta Methodology was developed through the application of Metamethodology. Draft I was then used as the guideline for the collection of linguistic data for the pilot study. Upon completion of the pilot study, in reconstructing what was done, Draft II of Mehta Methodology was developed. Draft II then provided the guideline for the field study. This Chapter concludes with Draft III of Mehta Methodology which evolved out of the application of Draft II. Draft III represents a combination of the processes and steps which were pilot tested and found to be effective with others which are hypothesized to be appropriate.

Mehta Methodology to Collect Valid Linguistic Data: DRAFT II

1.0 Select the case and modality for the collection of valid linguistic data.

1.1 Based on the interests and skills of the researcher, the literature should be searched to provide the background for this selection.
1.1.1 Case I: Language Acquisition

Case I, language acquisition and the oral modality were selected.

Case II: Stabilized Language Community

Case III: Dialect in Transition

Case IV: Language Deterioration

Case V: Miscellaneous

1.1.2 Modality:

Oral, written or contextual.

See steps I and II under "Application of Metamethodology" in this Chapter for background in the literature and further considerations made by the methodologist.

1.2 Narrow the area down so that you have a manageable sub-area.

Sub-area selected: Syntax.

1.3 Analyze the chosen sub-area for other various possible focuses and combinations of case and modality.

Other possible focuses: No changes were made.

2.0 Develop the experimental technique.

2.1 Explore alternative ways of investigating the methodology to collect valid linguistic data. Examples of ways for generating alternatives follow.

2.1.1 Use previous research on methodology to suggest alternatives.

The work of Carol Chomsky to determine a variety of ways to elicit responses to stimulus material
appeared inventive and worth considering.

12.1.2 Not applied.

12.1.3 Create an off-beat approach that could lead to obtaining certain data.

Some of Carol Chomsky's techniques were inventive and kept in mind to apply if appropriate.

2.2 Identify the critical requirements for the experimental approach.

Examples of these are procedures for eliciting responses, identifying and classifying data, length and complexity of data gathering, appropriateness of approach to case, modality, and population variables and finally resources needed and available to accomplish the task.

Some critical requirements:

Time availability of subjects, criteria for determining age best suited for purpose and present responses, substantive area of linguistics as related to subjects and means of collecting data, and substantive area as it related to the development of the experimental approach.

At this point, that is beginning at 3.0, Mehta Methodology has undergone further development. Thus Draft II is the same as Draft I up to 3.0, but from 3.0 on, changes have occurred. An outline of Draft II, starting at 3.0, is given below. It is followed, starting with 3.1, by the documentation of its application in the development of Interview-Ambiguity.
3.0 Develop interview to collect valid linguistic data.

Note: For each of the steps that follows, briefly describe the rationale and process for the results.

Interview

3.1 Design and run pilot tests of Interview No Name.

3.1.1 Use at least one of the following:

a. Determine applicability of Mehta Interview Formula #1.

b. Make changes in Mehta Interview Formula #1 or substitute another formula.

3.1.2 Select linguistic process of sub-area and specific aspect of it to be investigated.

3.1.3 Select stimulus materials to be investigated.

3.1.4 Specify organization of Interview No Name.

3.1.5 Specify the purpose of Interview No Name.

3.1.6 Specify requirements for Interview No Name.

3.1.7 Specify checks and procedure for classification of responses in parts during Interview No Name.

3.1.8 Specify checks and procedures for classification of responses after Interview No Name.

3.1.9 Specify verification of classification procedures.

3.1.10 Describe subjects.

3.1.11 Specify subject selection technique.

3.1.12 Determine environment for Interview No Name.

3.1.13 Specify equipment and materials used for Interview No Name.
3.1.14 Redesign Interview No Name within time constraints.
3.1.15 Relate steps of the development of Interview No Name.

3.2 Run field study of Interview No Name.

3.2.1 Specify procedures used in selecting sample.
   a. Specify procedure used to get consent of administration and teacher(s) of a school.
   b. Specify procedure used to get data and consent of parents.
   c. Specify procedure used to select subjects.
   d. Describe sample.

3.2.2 Specify physical arrangement of Interview No Name.
3.2.3 Specify equipment used.
3.2.4 Specify duplicating process of taped responses.
3.2.5 Describe scheduling and interviewing.

3.3 Specify the classification system of responses during and after the interview; indicate degree of agreement between researcher and assistant (someone with whom to check classification system).

Summary

(This is not a portion of the methodology. It is inserted here to provide for improved readability.)

3.4 Describe the classified data.¹
3.5 Analyze the classified data for each part.
3.6 Interpret the classified data.

¹The remaining portion of the methodology is in Chapter III.
3.7 Specify major problems encountered in
a. pilot testing, and
b. field testing.

3.8 Redesign Interview No Name.

****

3.1 Design and run pilot tests of Interview No Name.¹

3.1.1 Use at least one of the following:

a. Determine applicability of Mehta Interview Formula #1. (This formula follows with a description and an explanation.)

b. Make changes in Mehta Interview Formula #1 or substitute another formula.

Theoretical Framework: Mehta Interview Formula #1

\[
\left( \frac{a^{b+} b^{b+}}{Y_1^{b+} / Z^{b+} / Y_2^{b+}} \right) \left( a^1 b^{b+} \right)
\]

Interview

<table>
<thead>
<tr>
<th>Formula Symbols</th>
<th>Name of Parts and Checks</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Y_1 )</td>
<td>Exploration</td>
<td>The part ( Y_1 ) is the focus of the linguistic investigation.</td>
</tr>
<tr>
<td>( Z )</td>
<td>Expansion</td>
<td>( Z ) and ( Y_2 ) are required parts of the Interview.</td>
</tr>
</tbody>
</table>

¹The reader is reminded that starting with 3.1 a documentation of Mehta Methodology, Draft II, continues.

²Part: a part is a unit or component of the interview which must meet the specifications of the Formula.

³Check: checks are the objectives for the means of determining the meaning of linguistic competence. The checks are then operationalized or broken down to provide for their achievement.
Formula Symbols | Names of Parts and Checks | Explanation
---|---|---
$Y_2$ | Exploration | This part is the same as $Y_1$.
/ | | A slash indicates that the particular part which follows is required.
( ) and ( ) | | Any set of parentheses indicates that the enclosed can be included but is not required.
$\infty^a$ | Any part, e.g., Riddles, Questions | An infinity sign with subscript "a" represents an infinite number of parts which can but do not necessarily precede parts $Y_1$, $Z$ and $Y_2$.
$\infty^a_1$ | Any part, e.g., Sentence Completion | An infinity sign with subscript "a_1" represents an infinite number of parts which can but do not necessarily follow parts $Y_1$, $Z$ and $Y_2$.
b | Reliability Check | The notation "b" indicates the requirement of at least one check of validity.
$\infty^a b$, $Z^b$, $Y_2 (b^+)$, $\infty^a_1 b$ | Corroborative Check | These parts are separate corroborations of $Y_1$.

**Result of this step**

Mehta Interview Formula #1 was applied.

**Description of the rationale and process of this step**

The rationale of a formula for the Interview was to specify, in symbolic terms, what requirements were to be met. The planning and decisions made to bring this about were based on the interplay between theoretical linguistic requirements along with experiences and data from the interview process.
3.1.2 Select sub-area and linguistic focus to be investigated.

Results of this step

The sub-area of ambiguity was selected. More specifically the linguistic focus of the investigation was the ambiguity of certain lexical items when given equal stress to the adjoining noun or verb in orally presented stimulus material in Exploration:

Flying planes can be dangerous.

Description of the rationale and process for this step

There did not appear to be any compelling reason to investigate any particular aspect of linguistics. Therefore, the selection of ambiguity and the linguistic focus in particular was arbitrary. This decision was nevertheless based on a number of factors which included experimentation with particular stimulus materials and presentation strategies in Standard English in areas such as negation, reflexives and ambiguity. (The reader may wish to turn back to the description and examples of these transformations in Chapter I.) Out of this combined process, ambiguity was the choice which appeared fruitful to investigate.

3.1.3 Select stimulus materials to be investigated.

Results of this step

The results of this step can be found in Interview-Ambiguity, Appendix C for this Chapter.

Description of the rationale and process of this step

Selection of the stimulus material for the investigation of
ambiguity was based on linguistic considerations of the appropriateness of the materials for the specific area of ambiguity. When the linguistic requirements were satisfied, the cognitive needs were also considered. The methodologist therefore selected linguistic structures out of a pool of linguistically acceptable material which were hypothesized to be meaningful to the potential population to be investigated (children from approximately $5\frac{1}{2}$ years to 8 years of age).

3.1.4 Specify organization of Interview-Ambiguity.

Results of this step

The results were that the Interview was divided into parts which are specified below in the sequence in which they are presented in the Interview. The parts of Mehta Interview Formula #1 are related to the parts of Interview-Ambiguity.

<table>
<thead>
<tr>
<th>Interview Parts</th>
<th>Mehta Interview Formula #1 Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riddles and Questions</td>
<td>$\omega_a^b$</td>
</tr>
<tr>
<td>Exploration</td>
<td>$Y_1$</td>
</tr>
<tr>
<td>Expansion</td>
<td>$z^b$</td>
</tr>
<tr>
<td>Exploration</td>
<td>$Y_2$</td>
</tr>
<tr>
<td>Sentence Completion</td>
<td>$\omega_a^b$</td>
</tr>
</tbody>
</table>

The description of the rationale and process of this step

The organization of Interview-Ambiguity had to meet the requirements of Mehta Interview Formula #1. Various factors which contributed to the organization follow.
(1) The constraint of the time period for the actual Interview was a factor which determined the number of parts to be included. This in turn required considerations regarding:
   a. the tolerance of the children to be interviewed, and
   b. the requirements to be met regarding the variety of data needed to meet the requirements of the formula.

(2) The actual substance of the stimulus material was an important consideration in the organization for the planning of Interview-Ambiguity. Here again several factors were considered. To mention three of them, they were:
   a. the interests of the children,
   b. the hypothesized experiences of the children, and
   c. the cooperation of the children.

(3) The potential richness of the linguistic data to be generated was another consideration. Here the methodologist had to hypothesize about this because the amount of pilot testing could not be extended enough to provide substantial data for conclusive evidence for such decisions.

3.1.5 Specify the purpose of Interview-Ambiguity.
3.1.6 Specify the requirements for Interview-Ambiguity.

Results of these steps

By combining them, the methodologist intends to provide greater clarity to the readers. The purpose of any Interview was to provide for the collection of valid linguistic data based on a theoretically prescribed linguistic focus, with checks, and a subject response classification system as presented in Mehta Interview Formula #1.
Interview-Ambiguity was to meet the theoretical constraints of the Interview through specific requirements and procedures. The requirements which were to be met for Interview-Ambiguity are as follows:

(1) describe the linguistic focus,
(2) describe checks, and
(3) describe classification system for each part.

Description of the rationale and process of these steps

The methodologist arrived at the above results through the process of the experiences with Metamethodology and the pilot and field interviewing.

3.1.7 Specify checks and procedures for classification\(^1\) of responses in parts during Interview-Ambiguity.

Results of this step

The results will be presented for each of the parts, in the order in which they are presented in Interview-Ambiguity.

Part: Riddles

Directive. Present riddles and answers to subject. After the subject responds, decide if response is adequate for a classification to be made. If it is not, attempt to obtain more responses by questioning the subject. Do not provide clues regarding the ambiguity.

Reliability Check b. The reliability check is achieved by the

\(^1\)Classification of responses refers to the description of the utterances made by the subjects to stimulus materials. The specific type of classification differs from part to part. These will be described in step 3.1.8.
corroborative check \( c_{a} \). The use of riddles and the answers to them as stimulus materials provides a variety of types of ambiguity. The amount of disambiguation in riddles can be compared to the focus of the investigation. The check explores the relation between some general types of disambiguation and the more specific disambiguation required for \( Y_{1} \).

**Classification.** Classification procedure for responses during and after the Interview. The riddle is classified as correct when a dual interpretation is observed in the response to the riddles and the answers to them. The response to the stimulus material is classified as incorrect when the dual interpretations are absent.

**Part: Questions \( c_{a} \)**

**Directive.** Initially, make every effort to gain the attention of the child when the stimulus material is presented. (This is an essential requirement because repetitions are not allowed.) Make the introductory remarks. Then present the first question under each lexical item for each grammatical category. If the response is considered correct, go ahead to the next grammatical category or lexical item. If, however, the response does not receive a classification of correct, stay within the same group of questions until a correct classification can be given for the response. Do not vary the question or probe to get a correct response. No question is to be repeated.

**Reliability Check b.** The administering of additional stimulus
materials within the same grammatical category for each lexical item provides for the reliability check.

Corroborative Check $\omega_n^b$. This check provides for a base line for the understanding for the focus under investigation. For Interview-Ambiguity it is for the same lexical items as in "Exploration," $Y_1$, when placed in syntactical contexts which are unambiguous. Understanding in this context is interpreted to mean that the child does not demonstrate responses signifying confusion. The responses classified as correct connote understanding.

Classification. A classification of a correct response is made for one that connotes understanding. A classification of incorrect for the response is made when the response shows confusion.

Part: Exploration $Y_1$

Directive. Present the stimulus material and follow up questions as given on the tape.

Classification. Classify the lexical item as a verb or an adjective when there is evidence in the response that it has been used or responded to in either of the two categories. Evidence for a verbal classification is when the description or reference to the lexical item is action on the connecting noun. A description of the noun is evidence for the classification of an adjective.

Part: Expansion $Z$

Directive. A complex sequence of instructions combined with the stimulus materials must be given to the subject in the attempt to elicit both adjectival and verbal grammatical classifications.
Training and practice are required to accomplish the appropriate sequence.

**Reliability Check b.** Both sets of stimulus materials combined with the sequence of instructions are required.

**Corroborative Check Z**. This part incorporates instructions to the subject on how to use the stimulus materials to produce utterances which can be classified as both adjectival and verbal.

The check is the comparison between this part and the focus, \( Y_1 \).

A major difference between the two parts is that for this part the child is provided with instructions for the specified task while for \( Y_1 \), instructions are absent.

**Classifications.** If the lexical item in the response appears to be descriptive of the noun that follows, then it is classified as an adjective. The lexical item is classified as a verb if an action upon the noun is indicated in the response.

**Part: Exploration \( Y_2 \)**

**Directive.** The exact same procedure is used as for Exploration \( Y_1 \), therefore everything is the same for parts \( Y_1 \) and \( Y_2 \).

**Corroborative Check.** The administration of \( Y_2 \) is a corroborative check for \( Y_1 \).

**Part: Sentence Completion**

**Directive.** Give the child practice in filling in the missing word in trial sentences. After you are satisfied that the child understands the task, give stimulus materials to the subject for completion. Make queries regarding the child's decision. Provide
opportunities to change the supplied "to be" verb.

Reliability Check b. The reliability check is in the queries addressed to the child after the initial decision on a "to be" verb.

Classification. If the data for a subject is only the verb is to complete the sentence, then the lexical item is a verb; if only the verb chosen is are, the lexical item is classified as an adjective. It is classified as "both" if is and are are both considered acceptable by the subject.

The description and process of this result

Most of the pilot study was done very informally and the responses were not tape recorded. In the absence of taped responses, some of the responses were often written during the interview. The classification procedure was periodically reviewed only for "Exploration" and compared to the classifications made after Interview-Ambiguity was given. (The rationale and process for 3.1.7 and 3.1.8 will be considered jointly after the results for 3.1.8.)

3.1.8 Specify checks and procedures for classification of response after Interview-Ambiguity.

Results of this step

The checks and procedures for classification were the same for the parts during and after Interview-Ambiguity except for the part "Exploration."

Description of the rationale and process of these steps

These steps were considered together because the rationale and process is the same for both. The development of and decisions about
checks and the classification procedures represent an attempt to maintain consistency with the theoretical requirements and the purpose for Interview No Name. The methodologist also tried to satisfy such practical needs as simplicity and time constraints. One of the practical needs was the improvement of the means to elicit responses based on reviews of the written responses during the interviews.

3.1.9 Specify verification of classification procedure.

Results of this step

Very early in the pilot study, an effort was made to assess the degree of corroboration that would obtain between the interviewer and others for classification of grammaticality. Written responses of two adults were given to four adult women who volunteered to classify the material. They were not informed of the investigation of ambiguity. They were given oral instructions to decide whether particular lexical items were verbs or adjectives for sixteen sets of responses. The judgments were to be based on the written responses of the subjects to the specified stimulus material. The degree of agreement varied greatly between the two subjects. For one subject, the volunteers had only four disagreements on the classification with the interviewer. For the other subject, there was very little agreement with the interviewer on the classifications made of the responses. The methodologist interpreted this to mean that the interview for the latter subject needed improvement, to allow for responses which could have been
classified with greater agreement with the interviewer. Therefore, clues were sought and found in the responses to provide for improvement in the interview process for the future. No further efforts were made to determine the degree of corroboration for classifications prior to the field testing of Mehta Methodology.

Description of the rationale and process of this step

The factor of minimal time was a major consideration for the methodologist's decision not to expand this step. Certainly, although information was gained to the extent that the step was developed, and in a sense Pandora's Box had been opened, the successive steps were even more necessary to progress toward the accomplishment of the purpose.

3.1.10 Describe subjects.

Results of this step

There were 18 children and 17 adults who were the subjects of the pilot study. Most of the subjects were interviewed in their homes. The subjects who were interviewed in their homes, for the most part, lived no further than two miles away from the interviewer. All the subjects were white. Geographic background information was not specifically asked, but most of the subjects had lived in Amherst for at least five years. The sex composition of the children was 12 girls and 6 boys. Generally the parental education of the children was: mothers, at least a bachelors or masters degree; fathers, at least a masters degree with most having a doctoral degree. Educational characteristics of the adult subjects were as follows: 2 were still
in high school, the others had bachelors degrees, except for 1 who completed hers the following spring. The sex composition of the group was 4 men out of the 17 adults. English was assumed to be the first language for all of the subjects.

Description of the rationale and process of this step.

The methodologist did not systematically define a population and select a sample due to time constraints. However, she considered some requirements and variables which she hoped to have in a population for the field study. These are described below in a prioritized sequence.

(1) Accessibility of the methodologist to the subjects selected.

(2) Racial characteristics of the population. The methodologist is a white Caucasian woman. It was decided that the population should be of the same racial background to provide for a greater probability of rapport with the sample of children to be interviewed.

(3) Educational composition. In the small New England town in which the methodologist resided there was a highly educated group who were potentially accessible for interviewing. It was from this group that the subjects were selected.

(4) Age. The age of the subjects varied according to different points in the development of the Interview. Children were 3½ to 13½ years old. Adults were defined as 15 years of age and over.

(5) Geographic background of the population. The methodologist
wanted to include children in the population who had lived within a prescribed geographic area for a specified number of years. The purpose of this consideration was to narrow down the dialects to which the child might have been exposed.

(6) **English as a first language.** The methodologist wanted to include only children whose first language was English. Including children for whom English was a second language would add complicating factors.

(7) **Sex characteristics.** The methodologist wanted a population which was approximately representative of the population at large, which is a one to one ratio of males to females.

3.1.11 Specify subject selection technique.

**Results of this step**

Subjects were sought based on the list above.

**Description of the rationale and process of this step**

The methodologist started out with her own family, both husband and children and moved on to friends, acquaintances and contacts through friends. For the Interview-Ambiguity, arrangements were made by telephone with an appointment set up soon after the original call. All individuals were given the option of not participating. Only one child, not known by the methodologist, stated an unwillingness to cooperate. One adult, a friend of the methodologist, appeared so extremely uncooperative during the Interview that it was terminated before completion. The Interview-Ambiguity was given at
a time that was mutually agreeable between subject and interviewer. The methodologist continued to add to the sample size until the necessary experimentation had been satisfied. The purpose of interviewing adults was to provide for some data upon which to base certain assumptions or hypotheses regarding ambiguity, and for comparison of the interview experience with those for the children. The adults were told that the interview was being developed for application to children. The intent of Interview-Ambiguity was not revealed. On the whole the adults were cooperative, but there were exceptions. The men showed considerably less patience and interest than did the women. Several adults were selected because of particular skills in the use of English or adeptness in several languages. This confirmed an anticipation that such individuals might respond differently than the others. These particular adults appeared to be more perceptive in the various tasks. The adults were on the whole much more perceptive than the children of the dual interpretations of the stimulus material.

3.1.12 Determine environment for Interview-Ambiguity.

Results of this step

(1) For the children, most of the interviews were done in the child's room.

(2) For the adults, most of the interviewing was done in their homes at a time and in a place where interruptions were kept at a minimum.
Description of the rationale and process of this step

The methodologist decided that she had two alternatives of places to interview children and adults, either in her home or in the home of the subject. For the children she decided that the more familiar environment of the child's own home might be more appropriate. For the adults, their homes were more convenient to them. The children often showed real pleasure in having the methodologist come for a "visit." She was frequently invited back to "play." When interviewing was done in the home of the methodologist, it was done in her study.

3.1.13 Specify equipment and materials used for Interview-Ambiguity.

Results of this step

Tape recorders used: Wollensak 3M, Model 1520 AV at $3\frac{3}{4}$ speed (solid state, two track automatic record level, high impedance, and a dynamic microphone); Craig, Model 2106 at $3\frac{3}{4}$ speed.

Tape used: Concert Tape, Super Strength, 1800 feet.

Description of the rationale and process of this step

In the attempt to use the simplest possible approach, the methodologist excluded all toys. Initially, however, a plane was used with the younger children to discuss their experiences with flying. This was finally discontinued, because the information derived from this discussion did not appear to make a clear contribution.

3.1.14 Redesign Interview-Ambiguity within time constraints.

3.1.15 Relate steps of the development of Interview-Ambiguity.
Results and description of the rationale and process of this step ("Results" and "description" are combined to provide for a more meaningful description.)

The following will include comments upon a number of the experimental steps required to develop a methodology to collect valid linguistic data. It will be presented in a somewhat brief form due to the constraints of time. The comments will be primarily related to the application of the interview to children. A summary of the application to adults will be made in the concluding paragraph.

The organization was based on the experiences of interviewing 35 persons (18 children and 17 adults). As mentioned before, the children ranged in age from 3½ years to 13½ years of age. Some individuals were interviewed more than once for additional information as the organization of the Interview was formulated. Prior to initiating an Interview the methodologist spent some time listening to the language (providing very little stimulation) of a couple of 3½ year old girls who often played together.

First Experimentation.¹ On the basis of the early experience with the 3½ year olds and a discussion with Linda Thomas, the consultant linguist, the methodologist got together some stimulus materials on ambiguity. This was informally presented to a 5½ year old girl. Presentation of the material to a slightly older child

¹It would be helpful to the reader to refer to Interview-Ambiguity in Appendix C for this Chapter for comparative purposes throughout this step.
was done because it was anticipated that more cooperation and understanding would be forthcoming, as compared to younger children.

Second Experimentation. Experimentation was continued to determine among other things, in what ways subjects would respond not only to the substantive area but also to the Interview experience. On the basis of the data from the 5½ year old, the required age for the second set of interviewing was increased to determine if a higher level of functioning could be obtained. The interviewing that followed was on four adults and five children (with an age range for the children of 6 to almost 10 years of age; 3 girls and 2 boys). More of the stimulus materials were presented in an organized presentation, and a tentative sequence of parts was organized. At this point the organizational sequence of Interview parts was: "Exploration," "Sentence Completion," "Exploration," "Expansion," and "Exploration." In both "Exploration" and "Expansion," equal stress on the lexical item and the adjoining noun in the stimulus material had not yet been incorporated in the presentation. Nor had systematic requests made of the subjects to add more information after the initial presentation of stimulus materials become incorporated in "Exploration." The number of stimulus materials and presentation approach also varied from the field study version for "Exploration." "Sentence Completion" included only the initial task of filling in the missing word with no additional questions asked by the interviewer. The classification procedure was checked with the help of several adults. Based on the results of the checking procedure, the inter-
view process was improved and the classification procedure was considered to be satisfactory (refer back to step 3.1.9 regarding corroboration of classification).

Third Experimentation. On the basis of the second experimentation, several changes were made. The third interview was limited to only two "Explorations" instead of three. This change was made to reduce the repetitiousness of the parts and thereby to make the Interview less tiresome. "Sentence Completion" included questioning to determine if individuals would stick to their original decisions. The age range of the children sought was decreased for the purpose of getting some more definitive base lines for the classifications of responses. Four children (age range from 6 years 9 months to 7½ years; 2 boys and 2 girls) and 7 adults were interviewed.

Fourth Experimentation. By this point an attempt was made to control for the clue of the stress pattern or intonation in both "Exploration" and "Expansion." As equal stress as was possible was given to both the lexical item and the adjoining item. "Riddles" also became an additional part. This part was added to determine the possible relationship between the detection of ambiguity in varied types of stimulus materials. Selection of the riddles was based on responses by children who had previously been interviewed. The riddles were ordered sequentially, easiest to hardest, to take into account the facility in the detection of the ambiguity of the various riddles with the smallest numbers being the easiest. Other than the change in stress pattern and the addition of the part "Riddles," the interview remained the same. Four children (representing an age range
from 6 years 11 months to 7 years 9 months; all girls) and four adults were interviewed.

Fifth Experimentation. There were few changes in the last experimentation prior to the field study. The exception was in the addition of the part, "Questions." This part was to provide for the evidence of the classifications of responses to lexical items in nonambiguous linguistic structures. Also, while all of the other experimentations were presented completely orally, the fifth set of interviews were presented in a large measure on tape, as in the field study. The same taped recording of Interview-Ambiguity presented on the same tape recorder used in the field study was used in this presentation. The data collection process, however, was not taped. The fifth experimentation was presented to 2 adults.

Sixth Experimentation. On the basis of the last experimentation, it was decided that "Questions" should remain. Both the design of it and purpose for it appeared satisfactory. The sixth experimentation included the taping of the Interview and the use of the Interview-Ambiguity Record Sheet (see Appendix D for this Chapter). This Interviewing was carried out on four children who ranged in age from approximately 6 years 9 months to 7½ years. These were 2 boys and 2 girls. The taping process and the Interview Answer Sheet appeared to be satisfactory, thus it was decided that Interview-Ambiguity had undergone enough development to warrant a field study.

3.1.16 Describe the final form of Interview-Ambiguity used for field testing.
Results of this step

Interview-Ambiguity was in a form which could be understood only by the methodologist. It was later prepared in a form which could be readily used for additional presentations.

Description of the rationale and process of this step

Interview-Ambiguity was in a form that could be interpreted only by the methodologist because of time constraints. The school year was nearing completion and thus the deadline for data collection was rapidly approaching.

3.2 Run field study of Interview-Ambiguity.

3.2.1 Specify procedures used in selecting sample.

a. Specify procedure used to get consent of administration and teacher(s) of a school.

Results of this step

Through an acquaintance, a teacher in an elementary school was contacted. The field testing was described to her. She agree to allow the interviewing to take place, upon the agreement of the principal. Later she also suggested another teacher from whose class other children were drawn. The principal was out of town and the assistant principal agreed to the research project. No official papers or procedures were required. At a later date the principal requested an official statement of the purpose of the research and why it did not include Blacks. He also required the contact procedure with the parents to be changed. He indicated that policy decisions of the preceding year specified these requirements. The assistant principal and the teachers were not aware of these re-
quired procedures for carrying out research in the schools. (See Appendix II-E for the statement on race.)

**Description of the rationale and process of this step**

The school selected was chosen for its close proximity to the residence of the methodologist. A contact with a teacher was made in the hopes of increasing the chances of obtaining the cooperation of the school. (The methodologist was aware of the reality of numerous students trying to carry out research in the schools of the town, particularly in this one which happened to be connected with the University of Massachusetts.)

b. Specify procedure used to get data and consent of parents.

**Results of this step**

Initially the methodologist contacted the parents of the child to be interviewed by phone. First she specified her intent and requested an appointment to meet with a parent to get some information and the agreement for an interview. The appointment was made at a mutually agreeable time. After the change in the procedure in contacting parents, requested by the principal, there was no personal contact and a letter was sent to the parent. (See Appendix II-F and G for the two procedures employed.) On the whole the parents were most cooperative with both procedures. Some were extremely intent on determining the type of interviewing to which their child would be subjected. One father indicated his plan to sit in on the Interview. He did not come for the set time but left a message that the Interview could be carried out in his absence.
Description of the rationale and process of this step

The procedure of contacting the parent by phone in the field test situation as in the pilot testing was much more satisfactory to the methodologist in contrast to correspondence by mail. Most of the time the methodologist had the opportunity to meet the child in a familiar setting prior to asking him/her to accompany her to a different part of the school for the Interview.

c. Specify procedure used to select subjects.

Results of this step

Age, sex, race and parental education were the initial criteria upon which the selection of subjects was made. Initially, White children, whose parents had acquired at least a college degree, and who were within the age range of 6½ to 7½ years were randomly selected from a classroom. After several Interviews, the selection was based on the age, education and sex variables. This was done to allow for equally divided groups for all three variables. Then the educational requirement for parents was dropped. To meet the requirement for a sufficient number of subjects, the pool of potential subjects was increased to an additional classroom. "Random" is defined in this instance as a selection of the subjects based on the use of a random numbers table with children numbered by alphabetical order by surname for each classroom.

Description of the rationale and process of this step

The educational criteria for the population from which the sample was to be drawn was too demanding for the available time and money resources available to the methodologist for this investiga-
Therefore it was necessary to exclude it. No criteria regarding past geographic residential location of child were included for the same reason. (This was deleted after obtaining the results of several questionnaires from the parents.)

d. Describe subjects.

Results of this step

The subjects were 12 White children divided equally by sex. They range in age from 6 years 6 months to 7 years 8 months. The parental education of the children is within a range of a high school diploma to a Ph.D/Ed.D. for the father. (Tables which include these data can be found in Section A of Chapter III.)

Description of the rationale and process of this step

The composition of the sample was based on the rationale and procedure for "subject selection," along with necessary compromises.

3.2.2 Specify physical arrangement for Interview-Ambiguity.

Results of this step

The interviewing took place in a large hall which overlooked the classrooms. The hall was set up for observational purposes. The specific area in which the interviewing was done was away from the observation windows. The research was carried out after the academic year of the University of Massachusetts so that there would be very little observation taking place during the actual interviewing.

Description of the rationale and process of this step

The physical setting for the interviewing was poor because of
interruptions by persons using the observational facilities or using the space for tutorial needs. There was also noise from the gymnasium which caused difficulty in recording. Unfortunately, however, due to very crowded conditions there was no other available location for interviewing the children.

3.2.3 Specify equipment used.

Results of this step

Tape recorders: the same type of Wollensak was used as in the pilot study. The Craig recorder used in the pilot study was also used.

Tape: the tape was the same as in the pilot study.

Description of the rationale and process of this step

Although the equipment was potentially satisfactory, advice obtained on its use was not adequate. The tapes were defective. They had been put on the reels inside out. This was not detected until most of the children had been interviewed.

3.2.4 Specify duplicating process of taped responses.

Results of this step

All of the Interviews were duplicated. Initially this process was done by the audiovisual service of the School of Education of the University of Massachusetts. Then the complete set of interviews was duplicated by the audiovisual service which is provided for the entire University. Because of the latter services, awareness of the defective tape was determined and better duplications were obtained.
Description of the rationale and process of this step

The methodologist intentionally did not listen to either the original or duplicated tapes (other than checking to make sure that the interview was being taped). This was done in order to prevent her from changing the interview procedure from subject to subject once the actual field testing had begun.

3.2.5 Describe scheduling and interviewing.

Results of this step

Scheduling of the children was worked out in advance for each day with the classroom teachers. Most of the subjects were cooperative. The major exception was a child who was unwilling to be interviewed. He also had behavior problems in the classroom. Overall, there was considerably less enthusiasm shown by the subjects during the course of the Interview and afterwards as compared to the pilot interviewing.

Description of the rationale and process of this step

The methodologist and the subjects did not enjoy the interviewing experience in the school environment. In addition there was a problem of the time constraint due to the fast approaching end of the school year. These factors were very probably reflected in few bids from the children for a repeat opportunity as compared to the pilot study.

3.3 Specify the classification system of responses during and after the interview; indicate degree of agreement between researcher and assistant, i.e., someone with whom to check classification.
(Instructions given to the assistant follow examples of possible data.)

Results and description of the rationale and process of this step ("Results" and "description" are combined to provide for a more meaningful description. It is presented by the parts of Interview-Ambiguity.)

Part: Riddles and Questions. A riddle and a question were classified as correct in the field study in the same way that it was done in the pilot study both during and after interviewing. There was consistency in the procedure used by the methodologist and the assistant. The instructions for the classifications and some examples of the task given to the assistant follow.

Part: Riddles. Numbers 1-4 are riddles and their answers and the child's responses to them. The responses of the subject should indicate his/her dual interpretation of the riddles. Indicate by a check (✓) for each riddle if you consider the response to represent a dual interpretation. Use an (x) if the response is not satisfactory.

Riddle and Answer:

1. Why did the man put his TV in the oven?  
Because he wanted a TV dinner.

Child's Response:

It's funny because you couldn't get a TV dinner out of a TV. You get a TV dinner when you put food in the oven.

1 The assistant was a female Masters degree candidate in Sociolinguistics at the University of Massachusetts.
Riddle and Answer:

2. How do you know clocks are shy?  
   They always have their hands in front of their faces.

Child's Response:

Some little children put their hands in front of their faces when they're feeling shy. That's just like the clock.

Riddle and Answer:

3. What is the best day for making pancakes?  
   Fry day.

Child's Response:

Friday is a day. It's funny because it's Friday and that's the last day of the week. That's the day for confessions.

Riddle and Answer:

4. What has three feet and can't stand up?  
   A yard stick.

Child's Response:

Yard sticks can't stand up. They're too thin.

For the initial test of corroboration between methodologist and assistant there was agreement on seven out of the total of nine decisions for one subject. There was then 80% agreement on the classifications of the responses for nine randomly selected subjects.

Part: Questions. Some of the questions below have been asked of a child. Make a check (√) beside the question if you find the answer displays an understanding of the question. If the response is not correct, indicate by using an (x).

Question:

Do you like eating apples to be really cold?
Child's Response:

What? Yes, they are better that way.

Question:

Does eating apples with a friend sound like a good idea?

Child's Response:

Not really.

Question:

Have you ever seen flying planes do stunts in the air?

Child's Response:

Yes. It was really great.

Question:

Do you like the idea of flying planes as a pilot?

Child's Response:

No. I don't think so.

For the initial comparison between the methodologist and the assistant there was agreement on eight out of the nine classifications made for one subject. The comparison of the classifications on eight randomly selected subjects resulted in 86% agreement.

Part: Exploration. The procedure for the classifications for this part were not in written form for the Interview. The requirements for the classifications which were done after the Interview follow. They are in the form of instructions to the assistant who was requested to classify the utterances made by the subjects.

Instructions to the assistant: this portion of the screen

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1Screen refers to the checking system of determining the degree of agreement between assistant and the methodologist.
is taped. A sentence will be presented to the child followed by
the child's interpretation of the sentences. There are four sets
of sentences and interpretations. You are to decide whether the
first word of each sentence is a verb or an adjective. Your decision
must be based on however the child interprets the sentence. Indicate your interpretations below in numbers 1-4 for each part.
(The taped responses are not indicated here.)

Because the corroboration for one randomly selected subject
between the methodologist and the assistant was only 25% for both
"Exploration" Y1 and Y2, an additional assistant1 was sought to
determine if the low degree of corroboration would be replicated.
Her classifications were in 50% agreement with the methodologist.
The methodologist then made a second run of classifications to de-
termine the degree of corroboration with herself. She obtained
only 25% corroboration.

Further information and instructions were written to provide
for a basis for classification of the responses which might allow
for a higher degree of agreement between assistant and methodologist,
with a description of examples. These follow.

Instructions for classification: to interpret child's notion
of key words2 in certain stimulus sentences,3 your classification

1This assistant was a female working on a Masters degree in Public Health at the University of Massachusetts. All references to "assistant" in the future are for the student in Sociolinguistics.

2Key words: "flying," "eating," "fighting," "burning."

3Stimulus sentences: sentences presented to child for interpretation. (See listing of sentences in Interview-Ambiguity for "Exploration" in Appendix II-C.)
will be based on utterances by the child. This classification of the notion of the key words held by the child requires the application of instructions and procedures which follow. An example of the application of classifications which have been made by the methodologist is also given.

Example of Classification System:

Instructions:

1. Do not use procedures if utterance is clear.

2. Use procedures in the order that they are listed to make interpretation of child's notion of key word.

3. If child's utterance provides data which you consider to be conflicting, based on these procedures, then make your interpretation of the last sentence uttered.

4. If none of these procedures can be used to identify the key word of the stimulus sentence, then identify child's interpretation as ambiguous.

5. Do not make an interpretation based on cues given by interviewer.

Procedures:

A. If there is a pronoun (apparent or deleted\(^1\)) in child's utterance(s), identify what it refers to (with high probability), then interpret/classify

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\(^1\) "Deleted word" means one that you assume or read into a sentence but which is not actually there. For example, in the sentence "close the door," "you" has been deleted.
child's notion of key word.\(^1\) (If classification can not be made with high probability, omit it.)

B. If any form of the key word is in child's utterance(s) (apparent or deleted), classify it as either adjective or verb, then interpret child's notion of key word in stimulus sentence using the same classification.

C. Identify verb used in child's utterance: decide if key word or a variation of it can be substituted for verb, then interpret child's notion of key word.

(See example which follows.)

Example\(^2\) (this is an example of the utterances for several subjects; the classification procedure for these data and an explanation of it follow):

A. Stimulus sentence: Flying planes can be dangerous.

<table>
<thead>
<tr>
<th>Hypothetical Subject by Number</th>
<th>Identification</th>
<th>Procedures Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Verb</td>
<td>A,C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>They (planes)(^3) can hit (fly into) someone. So they (planes) should be careful.</td>
</tr>
<tr>
<td>2</td>
<td>Ambiguous</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You can get hurt. Accidents do happen. (To whom or what?)</td>
</tr>
</tbody>
</table>

\(^1\)Key words: "flying," "eating," "fighting," "burning," in the stimulus sentences.

\(^2\)See "Description of Example" which follows.

\(^3\)Words in parenthesis have been substituted by the methodologist to demonstrate the idea of what words have been substituted for certain pronouns.
Example (continued):

<table>
<thead>
<tr>
<th>Hypothetical Subject by Number</th>
<th>Identification</th>
<th>Procedures Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Verb</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>Adjective</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>Verb</td>
<td>B</td>
</tr>
</tbody>
</table>

B. Stimulus sentence: Eating apples can be delightful.

1. Ambiguous  None  They (apples) sure are good.  (To look at, to eat?)

2. Verb  B  Yes, I like to eat apples.

3. Adjective  None  They're better to eat than cooking apples.

C. Stimulus sentence: Fighting kids can be dangerous.

1. Adjective  A  I try to stay away from them (kids who fight).

2. Verb  B  Yes, but sometimes you have to (fight).

D. Stimulus sentence: Burning wood can be dangerous.

1. Adjective  A  But I like to watch it (wood that is burning) too.

2. Ambiguous  None  Sure, you have to be careful of it.  ("You" is one who builds or one who watches fires?)

Description of an Example:

In this example of the Classification procedure the methodologist has inserted some words as the basis for the classification for the
actual responses of the subject. These are in parenthesis. The words to which they refer are underlined. The letter for the procedures applied is entered in the Procedures Applied column. For example, for subject #1 planes has been substituted for the word they in both sentences. This represents procedure A. Fly into has been substituted for the verb hit. This represents procedure C. The classification of verb for flying is based on the resulting meaning of the combined two sentences after the changes which are based on the specified procedures.

Using this much more complicated procedure for classifications did not provide for an improved degree of corroboration between assistant and methodologist. There was agreement on only one out of the total of eight sets of utterances for both presentations of "Exploration" for one subject. The methodologist then used these instructions to determine the degree of internal corroboration that might be achieved. That is, she checked the consistency of her own classification against herself. Combining the results of two randomly selected subjects she got 75% agreement between the first and second classifications. Because of the constraint of time, it was necessary to be content with these findings and to use these instructions as the basis for the classifications. Therefore, these instructions were used as the basis for the classifications of the taped responses after the interview.

Part: Expansion. The requirement for the classification of the responses were essentially the same both during and after the
Interview. The instructions for the classifications given to the assistant were as follows:

For each set of utterances said by either the interviewer or child, make an interpretation of adjective or verb or both. Seven randomly selected subjects were selected for classifications of this part. There was a 94% level of agreement on the classifications achieved between methodologist and assistant.

Part: Sentence Completion. The basis for the classifications made during the Interview were not in written form. However, they were not in disagreement with the instructions given to the assistant, which follow:

Listen to the material given to the child, then listen to his/her decision of whether it is possible to use *is*, *are*, or both words in the blank(s). On the basis of the child's choice of words, indicate your interpretation of the grammatical category (adjective or verb) of the initial word of the sentence.

There were six classifications made for non-randomly selected responses. For this trial run, 100% agreement was obtained between assistant and methodologist. Finally, for the comparison of classifications between assistant and methodologist, for six randomly selected sets of responses of subjects, there was 89% agreement.

Description of the rationale and process of this step

Difficulty was not anticipated in obtaining corroboration on the classifications for the parts. The high level of agreement
initially obtained in the pilot study for "Exploration" was the rationale for this notion.

C

Summary

Through the use of Metamethodology, an initial draft of "Mehta Methodology to Collect Valid Linguistic Data" was developed and documented in Chapter II. The reader is thus familiarized with certain selected steps of Metamethodology and the results from their application. The methodologist then took Draft I of Mehta Methodology and continued its development by applying it to pilot and field testing. A major portion of Draft II, constructed through this process, was also documented.

In Chapter III the data are to be presented, analyzed and interpreted. Next there is a discussion of the problems encountered in the application of Draft II of Mehta Methodology. The third draft of the methodology which evolves is based on the earlier applications and an examination of its difficulties. Chapter III thus includes the remaining step (3.4-3.8) of Mehta Methodology.
CHAPTER III
CLASSIFICATION, INTERPRETATION AND ANALYSIS
OF LINGUISTIC DATA AND DRAFT III OF
MEHTA METHODOLOGY TO COLLECT LINGUISTIC DATA

Introduction

The level of development of a methodology to collect valid linguistic data is in an elementary form. Therefore the use of as simple and parsimonious a procedure as is possible to describe and interpret the data is appropriate. This is done in addressing a single question as it relates to the data. The question which is applicable for the data obtained in the use of Interview-Ambiguity is as follows: what can be said about the data when using age, socialization by sex and parental education as independent variables? This broad question will be considered through the way in which the tables are formulated, analyzed and interpreted.

The Chapter is divided into four sections. In section A, the independent variables are presented and described. Section B follows with a presentation, analysis and interpretation of the data. This is done first for the parts "Riddles" and "Questions." Then the data are analyzed for the remaining parts with a final analysis. Section C provides statements regarding problems in Draft II of Mehta Methodology. Draft III of "Mehta Methodology to Collect Linguistic Data" concludes Chapter III. The new draft encompasses changes which are based on the problems encountered in the application of the earlier draft.
The appendices for this Chapter provide the linguistic data by subject for each part of the Interview and footnotes for many of the tables.

A

Independent Variables: Age, Socialization by Sex\(^1\) and Parental Education

In this section the independent variables used to analyze the data will be described first. The range in age spans a period of 14 months. The children are from 6 years 6 months to 7 years 8 months. Six of the twelve children are in a 4 month age range at the lower end of the scale, which is from 6 years 6 months to 6 years 10 months. The age range for the older group is 7 years 2 months to 7 years 8 months which spans a 6 month period. Table 3.1 provides the ages of the children grouped into the two categories, younger and older by subject number.

<table>
<thead>
<tr>
<th>Number</th>
<th>Younger Group</th>
<th>Older Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6 yrs. 6 mos.</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>6 yrs. 9 mos.</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>6 yrs. 7 mos.</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>6 yrs. 9 mos.</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>6 yrs. 7 mos.</td>
<td>15</td>
</tr>
<tr>
<td>13</td>
<td>6 yrs. 10 mos.</td>
<td>16</td>
</tr>
</tbody>
</table>

Looking next at Table 3.2, Subjects by Sex Group by Number,

\(^1\)Subject number is based on the alphabetical order of the last name. These numbers are maintained to allow for reference to the data in Appendix III-A which have not been organized by variables.
it can be observed that the total group of children was composed of an equal number of females and males.

Table 3.2. Subjects by Sex Group

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

The third variable, parental education, is presented in Table 3.3, Age, Sex and Parental Education Groups for subjects. This variable requires some explanation. Parent(s) who were living with the child at the time of the Interview were asked to "Indicate degrees and/or number of years of education (achieved)." These data were listed from lowest to highest and rank ordered. This list follows in Table 3.3.

Table 3.3. Rank Order of Highest Education Achieved by Category

<table>
<thead>
<tr>
<th>Highest education achieved</th>
<th>Rank order</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school not completed</td>
<td>1</td>
</tr>
<tr>
<td>High school diploma</td>
<td>2</td>
</tr>
<tr>
<td>One year college or one year college + R.N.</td>
<td>3</td>
</tr>
<tr>
<td>Four years college</td>
<td>4</td>
</tr>
<tr>
<td>Bachelors degree</td>
<td>5</td>
</tr>
<tr>
<td>Bachelors degree +</td>
<td>6</td>
</tr>
<tr>
<td>Masters degree or masters degree +</td>
<td>7</td>
</tr>
<tr>
<td>Two masters degrees</td>
<td>8</td>
</tr>
<tr>
<td>Ph.D./Ed.D.</td>
<td>9</td>
</tr>
</tbody>
</table>

1The variable socialization by sex will be referred to simply as "sex" in all the tables and analyses.

2See footnote #1, previous page.
A summed ranking for parent(s) of each subject was determined. For two of these parents there was no spouse living with the family. The decision was made to make no change in the weighting procedure to rank order a single parent. The entire listing of parents by subject was then divided into lower and higher groups. The following table shows the educational level achieved by the parents in the two groups.

Table 3.4. Parents by Highest Education Achieved by Subject Number for Lower and Higher Educational Groupings

<table>
<thead>
<tr>
<th>Educational grouping</th>
<th>Subject number</th>
<th>Mother</th>
<th>Father</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>15</td>
<td>High school diploma</td>
<td>M.S. + M.Ed.</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>One year college</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>One year college + RN</td>
<td>Ph.D.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Four years college</td>
<td>No high school diploma</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>B.A.</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.S.</td>
<td>B.S.</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>B.S.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>B.A.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>B.A. + three years</td>
<td>Ed.D.</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>M.S.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>M.S.</td>
<td>Ph.D.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>M.S. +</td>
<td>M.S. +</td>
</tr>
</tbody>
</table>


Table 3.5. Variables Age, Sex\(^1\) and Parental Education by Subject Number\(^2\)

<table>
<thead>
<tr>
<th>Subject by number</th>
<th>Age group</th>
<th>Sex</th>
<th>Parental education group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>older</td>
<td>male</td>
<td>lower</td>
</tr>
<tr>
<td>3</td>
<td>younger</td>
<td>male</td>
<td>lower</td>
</tr>
<tr>
<td>5</td>
<td>older</td>
<td>female</td>
<td>lower</td>
</tr>
<tr>
<td>7</td>
<td>younger</td>
<td>female</td>
<td>higher</td>
</tr>
<tr>
<td>8</td>
<td>younger</td>
<td>female</td>
<td>lower</td>
</tr>
<tr>
<td>9</td>
<td>younger</td>
<td>female</td>
<td>higher</td>
</tr>
<tr>
<td>10</td>
<td>younger</td>
<td>female</td>
<td>lower</td>
</tr>
<tr>
<td>11</td>
<td>older</td>
<td>male</td>
<td>higher</td>
</tr>
<tr>
<td>12</td>
<td>younger</td>
<td>male</td>
<td>higher</td>
</tr>
<tr>
<td>13</td>
<td>younger</td>
<td>male</td>
<td>lower</td>
</tr>
<tr>
<td>15</td>
<td>older</td>
<td>female</td>
<td>lower</td>
</tr>
<tr>
<td>16</td>
<td>older</td>
<td>male</td>
<td>higher</td>
</tr>
</tbody>
</table>

In summary, the material in this section pertains to the variables used in this investigation. The data generated from the investigation follow.

B

Classified Data and Analysis by Independent Variables:
Age, Socialization by Sex and Parental Education

In this section the data of Interview-Ambiguity are given by the independent variables age, sex and parental education. The dichotomous groups for each variable have an equal number of subjects for all comparative analyses. The data will be presented in the sequence of the parts as used in the Interview. An analysis of Figures 1-6 and methodological and linguistic considerations conclude the section. Note that the footnotes for Tables 3.6-3.19 are

\(^1\)The variable socialization by sex will be referred to simply as "sex" in all the tables and analyses.

\(^2\)Subject number is based on the alphabetical order of the last name. These numbers are maintained to allow for reference to the unclassified data in Appendix III-A.
in Appendix III-B. They are also available in the back pocket of the binding.

Tables 3.6 and 3.7 which follow present the classified data by age, sex and parental education for the first two parts, "Riddles" and "Questions," of Interview-Ambiguity. An analysis and interpretation of these data follow.

Riddles and Questions: Analysis of Tables 3.6 and 3.7, Classifications of "Riddles" and "Questions" by Age, Sex and Parental Education:

These tables present the numbers and percentages of "Riddles" and "Questions" which have been classified as correct. These data are compared across levels of the variables age, sex and parental education.

First we will be observing the effects of the variables sex and parental education for both "Riddles" and "Questions" and of age only for "Questions." For these parts and the variables specified there is very little comparative difference in the percentage of correct classifications. For example, there is a difference of only 4% to 8% between the groups within the sex and the lower parental education groups. In the comparison by sex, the correct proportion of classifications are higher for females in both "Riddles" and "Questions." This is the only consistency across a variable for the two parts. In contrast, the higher correct classifications for "Riddles" is for the younger group while for "Questions" it is for the older group. Then, for "Riddles" it is the group of lower parental education which
has the higher percentage of correct classifications. While in "Questions" it is the higher parental education group which has the higher percentage of correct classifications.

Now looking at all three variables for "Riddles" and "Questions," there are only small differences within and between the sex and parental education groups. The only difference that appears significant is within the age category and then only for "Riddles." Within the age category, for "Riddles," there is a difference of 21 percentage points between the younger and older groups in terms of number of correct classifications, with the younger group being much higher. In contrast for all three variables in "Questions" the range of difference from the lowest to the highest correct classifications is 8%.

Table 3.6. Riddles: Correct Classifications by Age, Sex and Parental Education

<table>
<thead>
<tr>
<th>Age, sex and parental education groups</th>
<th>Total number given</th>
<th>Correct Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>28</td>
<td>13</td>
<td>46</td>
</tr>
<tr>
<td>Older</td>
<td>36</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>11</td>
<td>31</td>
</tr>
<tr>
<td>Lower education</td>
<td>35</td>
<td>13</td>
<td>37</td>
</tr>
<tr>
<td>Higher education</td>
<td>29</td>
<td>9</td>
<td>31</td>
</tr>
</tbody>
</table>

*See Appendix III-B for footnotes.
Table 3.7 Questions: Correct Classifications by Age, Sex and Parental Education

<table>
<thead>
<tr>
<th>Age, sex and parental education groups</th>
<th>Total number given</th>
<th>Classified Correct Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger</td>
<td>50</td>
<td>46</td>
<td>92</td>
</tr>
<tr>
<td>Older</td>
<td>49</td>
<td>49</td>
<td>100</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>49</td>
<td>100</td>
</tr>
<tr>
<td>Male</td>
<td>50</td>
<td>46</td>
<td>92</td>
</tr>
<tr>
<td>Lower education</td>
<td>50</td>
<td>47</td>
<td>94</td>
</tr>
<tr>
<td>Higher education</td>
<td>49</td>
<td>48</td>
<td>98</td>
</tr>
</tbody>
</table>

*See Appendix III-B for footnotes.

Riddles: Interpretation of Table 3.6. Correct Classifications by Age, Sex and Parental Education:

"Riddles" was presented primarily as a means of determining if it could serve as a screening device for the understanding of two meanings in the particular ambiguity under investigation. A very high percentage of the riddles was classified as incorrect. There were more correct classifications for the younger group but these still remained below 50%. There also does not appear to be any readily apparent relationship between these classifications and those made for the other parts. There are several conclusions that can be drawn from these data:

1. The classification procedure was too stringent.
2. The riddles themselves were too difficult.
3. These riddles were not sufficiently homogenous in type of ambiguity to provide for meaningful comparisons with other parts of Interview-Ambiguity.

While conclusions (1) and (2) may be true, it is the last one which seems most meaningful for this investigation.

Questions: Interpretation of Table 3.7. Correct Classification by Age, Sex and Parental Education:

"Questions" was intended to be an unobtrusive screening device to determine if the subjects would understand sentences which incorporated the underlying structure under investigation. Responses to "Questions" were classified as correct a very high percentage of the time by the subjects for each variable. (A correct classification is interpreted to mean that the subject had an understanding of the question presented.) The results show that the children had achieved a comparable level of understanding for the underlying structure and the three variables under investigation had little or no effect on the level of understanding of the subjects.

The conclusions drawn by the methodologist is that these children all had the requisite understanding for the ambiguity under investigation. It would be necessary to interview younger children to determine at what age such understanding is lacking. An examination of such data by sex and parental education level would allow for determining if these variables are of significance in the acquisition of this understanding.

The unobtrusive technique of getting these data was an example
of an effective procedure for determining the stage or level of linguistic competence attained.

**Exploration**: Analysis of Table 3.8. Classification by Type, Order of Presentation by Grammatical Categories by Age and Stimulus Materials:

There are so few inconsistent classifications that they will not be analyzed. Moving on to the consistent classifications, the first thing which one observes is the large number of verbal as compared to adjectival classifications. There are 2.7 times more verbal than adjectival classifications. However, the number of verbal versus adjectival classifications varies greatly by stimulus material and by age. For example, for stimulus materials 1 and 2 there are approximately the same number of verbal classifications for each age group. For stimulus material 3 there are three times as many verbal classifications for the older group as there are among the younger subjects. Again for stimulus material 4 there are no verbal classifications among older group and for the younger group there are very few such classifications.

In contrast to the above noted predominance of verbal classifications the number of adjectival classifications is the larger one for stimulus material 4.

**Exploration**: Analysis of Table 3.9. Classification by Type, Order of Presentation by Grammatical Categories by Sex and Stimulus Materials:

Looking first at the inconsistent classifications by sex, it
may be noted that there are twice as many of them for the 1st as compared to the 4th presentation. Combining both the 1st and 4th presentations there are almost three times as many inconsistent classifications for the females as compared to the males. Now looking only at the 1st inconsistent category, for the third stimulus sentence there is a higher number of them when compared to the other stimulus material. Because of the sparsity of classifications for the 4th presentation, further comparisons are impossible.

Next, in contrasting the inconsistent to the consistent presentations, it is observed that there are three and a half times as many consistent classifications, with slightly over three-fifths of them for males. Because there are so few classifications in the inconsistent categories compared to the consistent ones, there will be no further comparisons.

Finally focusing only on the consistent category, for stimulus sentences 1 and 3, there are a considerably higher number of classifications for males. Here the classifications for the males are primarily verbal. For stimulus sentence 4 they are altogether adjectival ones for males. For stimulus sentence 2 a clear pattern of a greater number of verbal classifications also exists for females. For stimulus sentences 3 and 4 a low and equal number of adjectival and verbal classifications shows evidence of no pattern of predominate grammatical categorization for females.
Table 3.8. EXPLORATION: GRAMMATICAL CLASSIFICATIONS\(^1\) BY TYPE, ORDER OF PRESENTATION\(^2\) BY GRAMMATICAL CATEGORIES\(^3\) BY AGE\(^4\) AND STIMULUS MATERIAL\(^5^*\)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Stimulus material</th>
<th>Grammatical classifications by type</th>
<th>Consistent 1st/4th Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inconsistent 1st Presentation</td>
<td>Inconsistent 4th Presentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adj. 6 Verb Amb. None</td>
<td>Adj. Verb Amb. None</td>
</tr>
<tr>
<td>Younger</td>
<td>1</td>
<td>- 1 1 - 1</td>
<td>1 - 1</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>1 - - 1 1</td>
<td>- - 1 1</td>
</tr>
<tr>
<td>Younger</td>
<td>2</td>
<td>- - - -</td>
<td>- - -</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>- 2 1 -</td>
<td>1 1 1</td>
</tr>
<tr>
<td>Younger</td>
<td>3</td>
<td>- 2 1 -</td>
<td>1 - 1</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>1 1 - -</td>
<td>- - 2</td>
</tr>
<tr>
<td>Younger</td>
<td>4</td>
<td>1 - 1 -</td>
<td>1 1 -</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>1 - 1 -</td>
<td>- 1 -</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Table 3.9. EXPLORATION: CLASSIFICATIONS\(^1\) BY TYPE, ORDER OF PRESENTATION\(^2\) BY GRAMMATICAL CATEGORIES\(^3\) BY SEX\(^4\) AND STIMULUS MATERIAL\(^5\)

<table>
<thead>
<tr>
<th>Sex Group</th>
<th>Stimulus material</th>
<th>Classification by type</th>
<th>Consistent 1st/4th Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inconsistent 1st Presentation</td>
<td>Inconsistent 4th Presentation</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Exploration: Analysis of Table 3.10. Classification by Type, Order of Presentation by Grammatical Categories by Parental Education and Stimulus Material:

For the data which have been arranged according to parental education, look first at the inconsistent classifications. The verbal and adjectival classifications are almost equally frequent.

Examining the consistent classifications, several distinctions between the lower and higher parental education groups are seen. There are appreciably more consistent classifications for the children of higher parental education. The ratio is none to four. The classifications for the higher parental education group are most often verbs. In contrast the classifications for the children of parents of lower education are equally distributed between adjectivals and verbials. There are, however, 4.8 times more verbal classifications as compared to adjectival when the classifications (irrespective of parental education) are totaled.

The classifications for stimulus materials 1 and 2 are predominantly verbal regardless of parental education grouping. For the higher group they are altogether verbal for these same stimulus materials. For stimulus material 3 the verbal classification again predominates for the higher group. It is altogether absent for the lower group. Finally, the results for stimulus material 4 deviate from those of stimulus material 1-3 just described. Here, irrespective of educational grouping there are four times more adjectival classifications that there are verbal ones.
Table 3.10. Exploration: Classifications by Type, Order of Presentation
by Grammatical Categories by Parental Education and Stimulus Material.

*For all footnotes see Appendix III-B.
Expansion: Analysis of Tables 3.11, 3.12 and 3.13. Classification by Type, Sequence of Presentation by Grammatical Categories by Age, Sex, Parental Education and Stimulus Materials:

The inconsistent and consistent classifications for the adjectival and verbal categories will be analyzed together for the tables 3.11, 3.12 and 3.13. Observe that there are only two sentences as stimulus material for "Expansion." The existing patterns of the data are therefore made clearer by describing and comparing the classifications by all three variables.

Looking first at both inconsistent and consistent classifications by age, sex and parental education, a similarity is noted in the quantity of classifications. It is very small. Next observe that for the 2nd presentation for both inconsistent and consistent categories across the three variables, the adjectivals predominate. While on the 3rd presentation for the inconsistent classification, the verbal classification appears characteristic for the 2nd stimulus material. For the 1st stimulus material neither grammatical category outnumbers the other.

Continuing to consider the stimulus material for all three variables, there are somewhat more classifications for stimulus material 2 as compared to 1 for the inconsistent category. For the consistent category there are more classifications for stimulus material 1. However, neither of these patterns is marked. Finally, the variables age, sex and parental education do not prove to be a means of revealing distinct characteristics within the grammatical classification or by
Table 3.11. EXPANSION: CLASSIFICATIONS\(^1\) BY TYPE, SEQUENCE OF PRESENTATION\(^2\) BY GRAMMATICAL CATEGORIES\(^3\) BY AGE\(^4\) AND STIMULUS MATERIAL\(^5\)*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Stimulus Material</th>
<th>Inconsistent</th>
<th></th>
<th>Consistent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2nd Presentation</td>
<td>3rd Presentation</td>
<td>2nd/3rd Presentations</td>
<td></td>
</tr>
<tr>
<td>Younger</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Older</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Younger</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Older</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Table 3.12. EXPANSION: CLASSIFICATIONS\(^1\) BY TYPE, SEQUENCE OF PRESENTATION\(^2\) BY GRAMMATICAL CATEGORIES\(^3\) BY SEX\(^4\) AND STIMULUS MATERIAL\(^5\)*

<table>
<thead>
<tr>
<th>Sex Group</th>
<th>Stimulus Material</th>
<th>Classification by type</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inconsistent</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2nd Presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adj.(^6)</td>
<td>Verb</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Table 3.13. **EXPANSION: CLASSIFICATIONS**\(^1\) **BY TYPE, SEQUENCE OF PRESENTATION**\(^2\) **BY GRAMMATICAL CATEGORIES**\(^3\) **BY PARENTAL EDUCATION**\(^4\) **AND STIMULUS MATERIAL** \(^5\)

<table>
<thead>
<tr>
<th>Parental education group</th>
<th>Stimulus material</th>
<th>Classification by type</th>
<th>Consistent</th>
<th>2nd/3rd Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inconsistent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2nd Presentation</td>
<td>3rd Presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adj. (^6)</td>
<td>Verb</td>
<td>Amb.</td>
</tr>
<tr>
<td><strong>Lower</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Higher</strong></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Lower</strong></td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><strong>Higher</strong></td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.*
stimulus material comparisons.

Further analyses for each separate variable does not seem appropriate because of the paucity of data.

**Sentence Completion:** Analysis of Tables 3.14, 3.15 and 3.16. Classification by Type, Sequence by Presentation by Grammatical Categories by Age, Sex and Parental Education and Stimulus Materials:

The data for the last part, "Sentence Completion," of Interview-Ambiguity are to be found in the above mentioned tables which follow page 117. Here again only the adjectival and verbal grammatical categories for inconsistent and consistent classifications will be analyzed. There are marked similarities and differences in the classifications between groups by age and sex groups and when parental education define the groups.

Looking first at the inconsistent classifications for all three tables, there are no classifications for the 6th presentation of stimulus material. Continuing with the inconsistent classifications, there are very few grammatical classifications for the 5th presentation and these are about equally divided between the two grammatical categories for all three variables.

Considering the consistent data by the variables of age and parental education, it may be noted that the adjectival classifications for all three stimulus materials put together somewhat exceed in number the verbal ones for each variable. What is more important, however, is that whereas the younger age group's classifications are dominantly verbal, the older age group's classifications are even
Table 3.14. SENTENCE COMPLETION: CLASSIFICATIONS\(^1\) BY TYPE, SEQUENCE BY PRESENTATION\(^2\) BY GRAMMATICAL CATEGORIES\(^3\) BY AGE\(^4\) AND STIMULUS MATERIAL\(^5\).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Stimulus material</th>
<th>Classification by type</th>
<th>Consistent</th>
<th>5th/6th Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inconsistent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5th Presentation</td>
<td>6th Presentation</td>
<td></td>
</tr>
<tr>
<td>Younger</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Younger</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Younger</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Older</td>
<td></td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Table 3.15. SENTENCE COMPLETION: CLASSIFICATIONS\(^1\) BY TYPE, SEQUENCE OF PRESENTATION\(^2\) BY GRAMMATICAL CATEGORIES\(^3\) BY SEX\(^4\) AND STIMULUS MATERIAL\(^5\)*

<table>
<thead>
<tr>
<th>Sex Group</th>
<th>Stimulus material</th>
<th>Classification by type</th>
<th>Consistent</th>
<th>5th/6th Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5th Presentation</td>
<td>6th Presentation</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Table 3.16. SENTENCE COMPLETION: CLASSIFICATIONS\textsuperscript{1} BY TYPE, SEQUENCE OF PRESENTATION\textsuperscript{2} BY GRAMMATICAL CATEGORIES\textsuperscript{3} BY PARENTAL EDUCATION\textsuperscript{4} AND STIMULUS MATERIAL\textsuperscript{5}\textsuperscript{*}

<table>
<thead>
<tr>
<th>Parental education group</th>
<th>Stimulus material</th>
<th>Classification by type</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5th Presentation</td>
<td>6th Presentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adj.</td>
<td>Verb</td>
</tr>
<tr>
<td>Lower</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Higher</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lower</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Higher</td>
<td>-</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Higher</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Higher</td>
<td>-</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

For all footnotes see Appendix III-B.
more dominantly adjectival; whereas the classifications for the females tend to be more verbal than adjectival, those for the males are predominantly adjectival; and lastly while the classifications for the lower parental education group are equally likely adjectival or verbal, they are clearly more likely to be adjectival for the higher parental education group.

**Exploration, Expansion and Sentence Completion:** Analysis of Tables 3.17, 3.18 and 3.19. Classification by Type, Parts and Sequence of Presentation by Grammatical Categories by Age, Sex and Parental Education:

Comparisons of the parts within the variables of age, sex and parental education must be done with some care. That is, the differences in total possible classifications for each part must be borne in mind. Keeping these differences in mind, it may be noted that there are markedly more consistent than inconsistent classifications for "Exploration" and "Sentence Completion." For "Expansion" the larger number of classifications is for inconsistent as compared to consistent.

"Expansion" will not be considered further because of the paucity of data. However, there do appear to be distinctions in the consistent classifications for the other parts. Therefore the methodologist decided that "Exploration" and "Sentence Completion" should be analyzed by the variables for the consistent category. This will be begun by looking at the data in Table 3.20.
Table 3.17. EXPLORATION, EXPANSION AND SENTENCE-COMPLETION: CLASSIFICATION¹ BY TYPE, PARTS, SEQUENCE OF PRESENTATION² BY GRAMMATICAL CATEGORIES³ AND BY AGE⁴⁺

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Exploration</th>
<th>Expansion</th>
<th>Exploration</th>
<th>Sentence Completion</th>
<th>Exploration</th>
<th>Expansion</th>
<th>Sentence Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inconsistent</td>
<td>Consistent</td>
<td>Inconsistent</td>
<td>Consistent</td>
<td>Inconsistent</td>
<td>Consistent</td>
<td>Consistent</td>
</tr>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
<td>5th</td>
<td>6th</td>
<td>1st/4th</td>
</tr>
<tr>
<td>Older</td>
<td>3 3 6 4 1</td>
<td>5 0 2 2</td>
<td>0 2 2 2 0 2 0 0 0</td>
<td>8 20 28</td>
<td>6 0 6 22 8 30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For all numbered footnotes see Appendix III-B.

⁺"A" stands for adjectival; "V" stands for verbal; "T" stands for the total adjectival and verbal classifications.
Table 3.18. EXPLORATION, EXPANSION AND SENTENCE COMPLETION: CLASSIFICATION\textsuperscript{4} BY TYPE, PARTS, SEQUENCE OF PRESENTATION\textsuperscript{2} BY GRAMMATICAL CATEGORIES\textsuperscript{3} AND BY SEX\textsuperscript{4*}

<table>
<thead>
<tr>
<th>Sex</th>
<th>Group</th>
<th>Exploration</th>
<th>Expansion</th>
<th>Exploration</th>
<th>Sentence Completion</th>
<th>Exploration</th>
<th>Expansion</th>
<th>Sentence completion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
<td>5th</td>
<td>6th</td>
<td>1st/4th</td>
</tr>
<tr>
<td></td>
<td>A+ V+</td>
<td>T+</td>
<td>A</td>
<td>V</td>
<td>T</td>
<td>A</td>
<td>V</td>
<td>T</td>
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<td>Female</td>
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<td>7</td>
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<td>5</td>
<td>2</td>
<td>2</td>
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<tr>
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<td>2</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

\textsuperscript{*}For all numbered footnotes see Appendix III-B.

\textsuperscript{+}"A" stands for adjectival; "V" stands for verbal; "T" stands for the total adjectival and verbal classifications.
Table 3.19. EXPLORATION, EXPANSION AND SENTENCE-COMPLETION: CLASSIFICATION$^1$ BY TYPE, PARTS, SEQUENCE OF PRESENTATION$^2$ BY GRAMMATICAL CATEGORIES$^3$ AND BY PARENTAL EDUCATION$^4$*

<table>
<thead>
<tr>
<th>Parental education group</th>
<th>Classification by type</th>
<th>Inconsistent</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exploration</td>
<td>Expansion</td>
<td>Exploration</td>
</tr>
<tr>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
</tr>
<tr>
<td>Lower</td>
<td>A* V+ T+</td>
<td>A V T</td>
<td>A V T</td>
</tr>
<tr>
<td></td>
<td>4 5 9</td>
<td>3 1 4</td>
<td>1 3 4</td>
</tr>
<tr>
<td>Higher</td>
<td>A V T</td>
<td>A V T</td>
<td>A V T</td>
</tr>
<tr>
<td></td>
<td>0 1 1 5</td>
<td>1 6 1 2</td>
<td>3 1 2</td>
</tr>
</tbody>
</table>

*For all numbered footnotes see Appendix III-B.

$^*"A"$ stands for adjectival; "$V"$ stands for verbal; "$T"$ stands for the total adjectival and verbal classifications.
Exploration and Sentence Completion: Analysis of Table 3.20.

Consistent Classifications by Parts by Grammatical Categories by Age, Sex and Parental Education:

The parts "Exploration" and "Sentence Completion" are not alike in that there is an imbalance of classifications between the two grammatical categories. There are 2.7 times as many verbials as there are adjectivals in "Exploration." In contrast, for "Sentence Completion" the number of adjectivals is only 1.2 times that of the verbials.

It is also interesting to note the difference between the total classifications for the two parts. The potential number of adjectival and verbal classifications for "Exploration" was 96 while for "Sentence Completion" it was 68. The actual number of classifications for "Exploration" was 52 and for "Sentence Completion" it was 58. Thus, for "Exploration" the actual number of classifications is 85% of those possible and for "Sentence Completion" it is only 54%.

Table 3.20. Exploration and Sentence Completion: Consistent Classifications by Parts, by Grammatical Categories by Age, Sex and Parental Education

<table>
<thead>
<tr>
<th>Grammatical categories by age, sex and parental education</th>
<th>Consistent classifications by parts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exploration</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
</tr>
<tr>
<td>Adjectival</td>
<td>14</td>
</tr>
<tr>
<td>Verbial</td>
<td>38</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
Exploration and Sentence Completion: Analysis of Table 3.21.

Consistent Classifications by Parts by Grammatical Categories by Age, Sex and Parental Education Groups:

Continuing with the comparison of "Exploration" and "Sentence Completion," observe the differences within each variable and between these parts. Compared to the age and sex variables, the greatest contrast between groups for total number of classifications for both parts is to be found within the variable parental education. Continuing with the comparison of totals within parts for the variables age and sex, the difference between groups by parts is very small and almost the same for "Sentence Completion." For "Exploration" by age, the difference between groups is only slightly greater, while for the sex group there are 1.4 as many classifications for males as there are for females. In contrast for parental education the number of classifications for the lower group is 2.3 times that of the higher group.

Examining the distinctions between quantity of classifications within each group for each of the variables we find that by far the sharpest contrast between grammatical classifications is for the parental education group in "Exploration." Here there are 3.8 times as many verbials among the higher as compared to the lower group. The next greatest contrast is for "Sentence Completion" in the parental education group where there are 3.3 as many verbials for the lower as there are for the higher group.

Consider, finally, the salient comparisons by grammatical classi-
Table 3.21. EXPLORATION AND SENTENCE COMPLETION:
CONSISTENT CLASSIFICATIONS\(^1\) BY PARTS
BY GRAMMATICAL CATEGORIES\(^3\) BY AGE,\(^4\)
SEX AND PARENTAL EDUCATION GROUPS*  

<table>
<thead>
<tr>
<th>Grammatical categories by:</th>
<th>Consistent classifications by parts and by groups</th>
<th>Exploration</th>
<th>Sentence Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Younger</td>
<td>Older</td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Adjectival</td>
<td></td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Verbial</td>
<td></td>
<td>18</td>
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</tr>
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<tr>
<td>Sex groups</td>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>Adjectival</td>
<td></td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Verbial</td>
<td></td>
<td>16</td>
<td>22</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education groups</td>
<td></td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>Total</td>
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<td>16</td>
<td>36</td>
</tr>
<tr>
<td>Adjectival</td>
<td></td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Verbial</td>
<td></td>
<td>8</td>
<td>30</td>
</tr>
</tbody>
</table>

*For all footnotes see Appendix III-B.
fications within each group. In "Exploration" for parental education there are 5 times more verbials than adjectivals in the lower group. The contrast which comes closest to this is in the same part with 3 times the number of verbials as adjectivals in the younger age group.

Because there are certain marked distinctions for the grammatical categories across the variables and between these parts, an additional means of observing these data will be provided. Histograms will allow for further considerations and interpretations of the data.

Exploration and Sentence Completion: Figures 1-6. Analysis and Interpretation of Exploration and Sentence Completion: Number of Adjectival and Verbial Classifications by Age, Sex and Parental Education:

To review, there are 12 possible classifications for each stimuli for each group within a variable. The range of actual classifications for each group is from 1 to 12.

Age, sex and parental education are demonstrated to be important variables as attested to in certain distinct patterns of consistent grammatical categories in the two parts, "Exploration" and "Sentence Completion."

Consider the histograms for "Exploration," Figures 1, 2 and 3, and observe that the verbal classification is more predominant for 15 out of the 24 possible comparisons. For only 5 of the comparisons the adjectival category is the more typical, and for the remaining 4 comparisons there is a tie between the two grammatical classifications. For "Sentence Completion," Figures 4, 5 and 6, the adjec-
tival classification is higher for 11 comparisons and the verbal for 5 out of a total of 18 possible comparisons, with a tie between verbal and adjectival for the remaining two comparisons. For "Exploration," the older, the male and the higher parental education groups are the ones for whom the classifications are typically verbal for stimulus materials 1-3, and to a somewhat similar extent this is also the case for the other groups, i.e., the younger, the female and the lower parental education groups (the one exception being the grammatical classification for the last group for stimulus material 3).

Looking at "Sentence Completion," it is again the older, the male and the higher education groups for whom there is a consistent dominant classification. This time it is adjectival.

The last observation is that for stimulus material 2 which was the same, grammatical classifications were in opposite order of dominance across parts for all three variables, older, males and higher education groups. This stimulus material happens to be the only one in which the same lexical items, "flying planes," were used.

While distinctions for the variables for the more typical grammatical category appear particularly clear for "Exploration" and to a somewhat lesser extent for "Sentence Completion," the lack of overall agreement for the grammatical classifications for the two parts is puzzling. It would appear that this difference across the two parts does not allow for the support of the notion of the likeness of the underlying linguistic structures of the stimulus materials. This observation will be considered methodologically.
Methodological and Linguistic Considerations

Methodological considerations. In order to make it possible to generate comparable data, certain requirements for the relationship across parts are necessary. The requirements for the parts of an Interview must be that they have known and comparable compositions. The parts of Interview-Ambiguity do not strictly meet this requirement. Thus a new definition of a part is appropriate and follows:

A part is a segment or portion of the Interview consisting of components and directives intended to elicit utterances/responses from which valid linguistic data can be generated.

To continue the methodological considerations we will break a part down into components which must be defined or operationalized.

Components of A Part of Interview

1. Stimulus Material
   a. Underlying Structure (Describe and explain.)
   b. Surface Structure (List and explain.)
2. Task Required of Interviewer (List and explain.)
3. Technique of Reacting to Responses of Subject (List range of subject responses and ways of dealing with them.)
4. Tasks Required of Subject (List and explain.)
5. Type of Responses Elicited (Provide randomly selected evidence of transcribed responses.)
6. Procedure for Classification of Responses (Develop operationalized procedures for data classifications.)

The requirements for the first component are that the differences and similarities between underlying and surface structures and across
parts be clarified. In this investigation the theoretical identity of the underlying structure of the stimulus materials was explained in Chapter I. The second component requires that the task of the interviewer be specified. This can be done in the instructions for the Interview as was done for Interview-Ambiguity.

For the third component the stimulus materials must be tape recorded for each part. Here it is required that the interviewer determine the range of responses of the subjects and have prescribed ways of dealing with them. This means that there has to be enough pilot investigation to provide for a listing of possible responses and effective ways of eliciting data which can be classified. This procedure provides for a means of developing systematic ways of responding to subjects.

Continuing in the identification and description of the components of a part of Interview-Ambiguity, the differing tasks demanded of the subject must be described. For example, for "Exploration" the task is an open ended one. No prescribed task other than simply to react to the stimulus material and "tell what it means" is demanded of the subject.

The next component pertains to the responses which are generated for a part. It simply requires that evidence of the types of data be provided.

The sixth and final requirement is that the classification procedures for the responses for the parts must be operational and repeatable. For data to be of a meaningful character, precautions should
be taken to insure their reliability. The difficulties encountered in this investigation regarding the corroborative effort on the classification procedure are lesson enough for the methodologist to be aware of the importance of this component. When these components are incorporated in the parts for the Interview, the classifications of the responses to the stimulus material should then be predictable across parts if the linguistic theoretical positions are sound.

Now to return to the discrepancy between the parts for the grammatical classifications in Figures 1-6. That a likeness in grammatical classifications between the parts "Exploration" and "Sentence Completion" does not exist is a very probable finding because the components as just described had not all been present. However, what is significant in the examination of the data using the variables age, sex and parental education is that clear patterns of grammatical classifications emerged (comments will be made on this in "Linguistic Considerations"). This suggests that these variables are of considerable value even when the means of collecting linguistic data are faulty. A more rigorous methodology would provide the means of determining the contributions of these variables to grammatical distinctions or other aspects of underlying structures.

*Linguistic considerations in generative grammar.* In the pilot study it was observed that most of the adults who were interviewed did not demonstrate evidence of an awareness of the ambiguity under investigation. Some demonstrated an awareness of two possible meanings as the Interview progressed. This might have been based on an
intellectual perception of the purpose of the Interview. It could also have been a treatment effect. That is, the nature of the parts may have brought about an awareness of ambiguity.

It can't be concluded that for the adults who did not detect the ambiguity that there had never been the knowledge of the underlying structures for such ambiguity. One of the possibilities it suggests is that more fundamental to the detection of ambiguity of any type is the judgment of contextual meaning. That is, that although adults may be able to detect two meanings, it isn't generally done in order to allow for the practical process of communication. Therefore, while both abstract forms of the particular ambiguity may be arrived at, closely following such knowledge is the selection of one meaning or underlying structure and the rejection of another. All of these processes are thought by linguists to be without the awareness of the speaker/listener.

If this is the case, what might the implications be for this particular type of ambiguity in regard to language acquisition? A three stage process is suggested and will be described and related to other notions of language acquisition in the literature. In stage I there would be the rote memorization of the underlying structures which are present in ambiguous sentences. This means that the child can understand the underlying structures in unambiguous strings which have the possible meanings for particular ambiguous strings. However, at this point the child would have no competence in distinguishing between the two underlying structures of the ambiguous
material.

In stage II there would be the understanding and production of only one of the possible underlying structures of the ambiguous material. This particular underlying structure would not necessarily be the appropriate one for the contextual demands of the situation. It is assumed that the rote memorization in stage I serves as the basis for stage of over-generalization.

In stage III the individual produces and understands the ambiguous material appropriate to the contextual situation. For most the choice would be based on contextual appropriateness. In this stage most speakers would recognize only one of the meanings of the ambiguity. For a very few speakers there would be evidence of the knowledge of the various possible underlying structures for such ambiguity. This stage reflects the re-analysis which has occurred. For some the conscious recognition of this type of ambiguity would be spontaneous and the reality of this recognition readily apparent. For others certain techniques might have to be used to tease it out. For still others there would be the denial of the presence of the ambiguity.

C. Chomsky has organized data in her study which has allowed her to categorize stages of language acquisition. These stages are very similar to those described in this investigation. The data, stages and the methodologist's characterizations can be found in the appendix of this chapter.
Throughout the acquisition process, whatever the stage happens to be for the speaker/listener, it would generally be definitive and lacking in flexibility. That is, the speaker/listener is usually quite sure of the correctness of the particular choices which have been made.

It is hypothesized that the most important variable which could be used to explore this notion of language acquisition would be age. It should be a crucial variable which would allow for factoring out developmental evidence which could support these particular notions of ambiguity. The reason for this assumption is a linguistic one. Generative grammarians have hypothesized that all languages are fundamentally alike. The acquisition process can therefore be expected to be fundamentally the same across languages. These hypothesized stages and other stages should consequently be the same for children around the world. While age may contribute heavily, sex and parental education might also make observable contributions.

Let us now look at the linguistic data reported in this investigation and determine in what ways these data can be related to this three stage notion of language acquisition for this particular type of ambiguity. This analysis is made with the awareness that these data do not precisely meet the requirements for the collection of linguistic data as presented in Draft III of "Mehta Methodology to Collect Linguistic Data." Despite the questionable characteristics of these data, certain striking patterns provide evidence for ob-
servations, comment and support for the sequential notion of language acquisition under consideration.

It can first be said that the linguistic data which have been reported provide evidence for the first two stages just described. In "Questions" there is very clear evidence that these children have acquired competence in the underlying structures of the unambiguous stimulus material presented to them. Next, for all of the children there is linguistic evidence to support the notion that one or the other of the two possible underlying structures is recognized at some point in the Interview. This is therefore considered stage II of the process.

For children younger than the youngest subjects of the field study, at some point only stage I would be present and for children older than the oldest children in the study it is hypothesized that both stages I and III would be present. For the adults who were interviewed evidence of the knowledge required for stages I and III were observed.

Finally, it was noted by the methodologist that the linguistic data of the pilot and field tests provide evidence of an overall characteristic of a conviction of being correct on the part of the speaker/listener, regardless of the particular linguistic stage achieved.

Due to time constraints no further theoretical considerations are possible. It is appropriate that the next section should begin with a description of the problems in this investigation and con-
clude with Draft III of the methodology.

D

Problems in the Application of Draft II of Interview of Mehta Methodology to Collect Valid Linguistic Data

The following is a continuation of the documentation of Mehta Methodology.

3.7 Specify major problems encountered in

a. pilot testing, and
b. field testing.

Results of this step

There were three major problems which were encountered in the sequence of steps of the Interview.

In this investigation the pilot study was on the interview process, particularly in the area of the stimulus material. The data classification technique, use of equipment, location of interviewing and sampling procedures were not investigated in the pilot study for the field investigation. These aspects of the Interview, clearly an integral part of it, were the areas in which problems were encountered in the field study. Thus in the application of Draft II of Interview, a major problem was that the pilot study was too narrowly defined.

Another major problem pertains to the definition of the formula. In this investigation, Mehta Interview Formula #1 was considered to be appropriate and was used. However, in the final steps of the application of Draft II of Interview, improvements in the methodology
vestigation. An example in generative grammar is the theory of the existence of an underlying structure for all languages.

3. Select an aspect of a particular theory to investigate. An example of this is the likeness or difference between underlying structures as compared to the surface structure.

4. Select a specified focus of the aspect of the particular theory to investigate. To continue with the example above, ambiguity is an area which can be examined to determine either the likeness or difference of the underlying structure as compared to the surface structure of the inquiry.

5. Continue to narrow down the focus to the degree necessary for relevant data to be generated.

6. Specify types and rationale of the techniques which are to provide relevant evidence for the focus.

B. Goal: To generate valid linguistic data

1. Content Validity
   a. Investigate and defend the stimulus materials for their representativeness of the specified focus of the aspect of the theory to be researched.
   b. Incorporate variations in the stimulus material to provide for verification of the focus.

2. Predictive Validity
   Investigate and defend the stimulus materials for their predictiveness or concurrence between research data and theory.
3. Construct Validity

Investigate and defend the design of the experiment for its potential basis for relating the focus of the aspect of the theory for investigation to specified variables or to other focuses of investigation.

4. Replicability

Repeat the stimulus material for the focus of the investigation.

C. Goal: To generate linguistic data which can be replicated.

1. Determine and specify the means by which linguistic data can be collected which can be potentially replicated for specified populations.

2. Provide for the means by which replication of data can occur within the experiment.

III. Select the case and modality to be used in the investigation of the problem.

A. Based on the interests and skills of the researcher, the literature should be searched to provide the background for this selection:

1. Cases:
   Case I: Language Acquisition
   Case II: Language Community
   a. Historical
   b. Modern
      i. Stable
      ii. In Transition
   c. Comparative
   Case III: Language Pathology
   Case IV: Miscellaneous

2. Modality: Oral, written or contextual
study.

18. Recycle to step 17 of V as time constraints allow.

VII. Interpret findings and make recommendations for subsequent investigations.

A. Specify implications of investigation.

VIII. Briefly summarize the results of the application of Mehta Methodology to collect linguistic data using the outline which follows.

A. Relation of discipline to problem and purpose

B. Theory tested

1. Specific focus

   a. Example

C. Goals

D. Case and Modality

E. Formula

   1. Formula applied: i.e., Mehta Interview Formula #2

   2. Formula applicability: i.e., Mehta Interview Formula #2

   Underlying structure, Ambiguity

F. Theoretical Findings

G. Recommended Changes or variations for Methodology and Formula

   1. Mehta Methodology to Collect Linguistic Data

   2. Mehta Interview Formula #2
CHAPTER IV

SUMMARY, INTERPRETATIONS AND IMPLICATIONS FOR RESEARCH

A

Summary

Research in language acquisition based on some of the linguistic theory set forth by Noam Chomsky and his collaborators has been carried out for over a dozen years (2, 4, 5, 6, 7, 8, 9, 13, 16, 17, 22, 23, 27). Methods and approaches used for these investigations have been discussed in Chapter I in a critique of some of the literature. Based on this critique, the acceptability of the collected linguistic data was questioned and found to be less than desirable. Problems, because of the methods used by the researcher, were identified. The work of Carol Chomsky was cited as an example of exceptionally good methods used to collect linguistic data (9). But the absence of methodology for the collection of linguistic data was noted in all of the studies. It was suggested that to provide for the means of collecting linguistic data upon which to test theoretical assumptions, improved strategies regarding the type of utterances to be used were required. Finally, the development of a methodology for the purpose of collecting valid linguistic data was recommended. Methodology was defined as "... a systematic, operationalized, standardized set of rules and procedures designed to accomplish a defined purpose." (18)

The absence of methodology in many areas was considered. Then the use of computer methodology was compared to the recent development
of evaluation methodology (3). Metamethodology of more recent origin was cited as the basis upon which methodologies could be developed (31). Metamethodology was selected as the framework on which to build a methodology to collect linguistic data.

Very briefly, Metamethodology, in a series of interlocking prescriptive steps, provides the methodologist with the prescriptive process for the development of a methodology. In this investigation it was used to develop a methodology for the purpose of collecting linguistic data. The methodologist documented the process of development by specifying not only the product but the process of the prescribed steps. "Mehta Methodology to Collect Linguistic Data" was developed through pilot and field tests. In this investigation it was used for an exploration of language acquisition for a particular type of ambiguity based on Chomskyian theory of generative grammar.

The resulting Mehta Methodology is also a series of interlocking prescriptive steps. It includes a specific type of research design called Interview No Name which requires the use of Mehta Interview Formula #2. The Formula specifies a number of requirements which must be met in order to satisfy certain goals of the methodology. The Formula also specifies optional steps, which, if followed, would lend additional rigor to the design of the study.

The study itself involved both pilot and field studies with adults and children as subjects in the former, but only children in the latter. The White children in the field study ranged in age from 6 years 6 months to 7 years 8 months. They were divided equally by sex and
were representative of a wide fairly high parental education background. The 12 children of the field study were interviewed in their school by the White methodologist.

B

Interpretations and Implications

Generative grammar. This investigation pertained to a particular type of lexical ambiguity theorized to exist for certain sentences. An example of an ambiguous sentence used in the investigation follows with tree diagrams which represent the possible underlying structures or meanings. The tree diagram is the technique used to represent the abstract form of the sentence and is broken into constituents or natural groups of words. The constituents of the sentence (S) which have been used are identified as follows: noun phrase (NP), verb phrase (VP), and noun (N). The diamond (Δ) indicates that the constituent is not broken down as far as is possible. Further break down of certain constituents is not necessary for this discussion.

(1) a. flying planes can be dangerous

```
   S
      / \  
     /   \
NP   VP
   /   /  
(someone's) flying of the plane is dangerous
```
Other examples of sentences with this type of ambiguity which were used in the investigation follow.

b. eating apples can be delightful

c. hitting kids can be dangerous

d. burning wood can be dangerous

Because of the linguistic notion that the speaker/listener has knowledge or competence for these underlying structures, it was assumed that adults would recognize the two types of ambiguity of sentences or stimulus materials such as or similar to example (1). Anticipating the collection of linguistic data which would support this notion, the plan was to investigate the language of young children to determine characteristics of acquisition for such ambiguity. However, linguistic data which supported the presence of the knowledge of two underlying structures appeared to be more the exception than the rule for adults. Nevertheless, they seemed to have no difficulty in responding to sentences in which either one or the other of the underlying structures was theorized to be present. Examples of these follow.
(2)  a. do you stay away from fighting kids

   b. have you ever been caught fighting kids

  In the field test the characteristics of the linguistic data for the children were somewhat the same as those for adults. The difference was that there was less evidence to support the notion of the presence of two underlying structures for the ambiguous stimulus materials. There were, however, some systematic differences in the linguistic data for particular types of underlying structures selected. These differences were noted in the comparisons between the parts of the Interview by age, sex and parental education and also by the particular stimulus material.

These linguistic data were interpreted in what was described as a three stage process of acquisition which is based on conjectures from the linguistic data of this investigation. This three stage process is summarized in an outline which follows on page 157. These stages were compared to the research of C. Chomsky, who provided evidence for similar stages for the acquisition of a specific verb (promise) which is at variance with a particular rule system. Chomsky's stages and a characterization of them are provided in the appendix of this chapter.

Finally, regarding the theory in generative grammar as it relates to this study, the stimulus material was characterized syntactically as described in the tree diagrams. Thus, within and across each part in the Interview the stimulus materials were comparable. However, linguistic assumptions regarding the key lexical\(^1\) items were not presented. An impli-

\(^1\)Lexical is "Of, pertaining to, or connected with, words, or the vocabulary of a language, as distinguished from its grammar or lexico-
cation of this investigation is that such a consideration is essential in order to make semantic comparisons.

Stages of Acquisition for Ambiguity

<table>
<thead>
<tr>
<th>Characterization of Stages</th>
<th>Linguistic Assumptions Regarding Unconscious Processes</th>
<th>Characteristics of Language Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I: Rote Memorization</td>
<td>Memorizes the underlying structures of unambiguous material.</td>
<td>Produces and understands unambiguous sentences which have the underlying structures of the ambiguous material.</td>
</tr>
<tr>
<td>Stage II: Over-Generalization</td>
<td>Draws a parallel between one underlying structure of ambiguous sentence to one of the memorized structures of Stage I.</td>
<td>Produces and understands a possible meaning of ambiguous sentence. It is not necessarily the correct one contextually.</td>
</tr>
<tr>
<td>Stage III: Re-analysis</td>
<td>Makes a reading of the ambiguous sentence. Detects possible meanings. Selects one of the underlying structures.</td>
<td>Produces and understands the ambiguous material appropriate to the contextual situation.</td>
</tr>
</tbody>
</table>

The semantic theory of linguists Katz and Fodor suggests additional ways of theorizing about the type of ambiguity under investigation (13). Certain aspects of it will be very briefly described.

According to these theorists, linguistic description minus grammar equals semantics.¹ The two components of semantics are the dictionary entry and certain types of rules which are required to combine the dictionaries.

¹ Here grammar is interpreted broadly to mean syntax, phonology, phonemics and morphology.
First a form for the dictionary will be presented followed by a description of it.\(^1\)

```
  flying planes (air planes)
    adjective
      [swiftly moving through the air]
    verb
      [navigation of plane by pilot]
      [use of plane for transportation by passenger]
```

This form is classified as follows, the unenclosed elements are grammatical markers and the bracketed material is called the distinguisher. The degree of complexity of the form for a particular dictionary entry is that which is required to select the sense characterization of a particular lexical item and relate it to the sense characterization of the other lexical items of a sentence. The rationale for this particular dictionary entry is based on the dialect of the methodologist. The branch of the verb which has the distinguisher, "use of plane for transportation as a passenger," is absent for people whose dialect does not include this meaning for the phrase "flying planes."

Forms for the examples of (1) are presented for the purpose of allowing the reader to observe the similarities and differences for the key lexical items in one of the parts of the Interview.

\(^1\)Flying has more meanings than those presented here. It is being described in this instance only in connection with planes (air planes) as it appeared in this investigation.
The semantic theory of Katz and Fodor combines the dictionary entry with rules for the possible combinations of entries to provide for a sensical output. Dictionary entries and the particular rules could be formulated and tested for certain stimulus material in an attempt to determine if there is support for these postulates for semantics. This can be done through application of Draft III of "Mehta Methodology to Collect Linguistic Data."

Methodology. Finally, regarding methodology, "Mehta Methodology to Collect Linguistic Data" represents an initial attempt to address the problem of the paucity of testing of theoretical propositions.
about language which are based on methodologically generated data. This investigation has demonstrated that a methodology as defined by Hutchinson was possible to develop. Also because of the broadness of the purpose and goals of Mehta Methodology it can be used by researchers of diverse backgrounds such as sociolinguistics, psychology, and anthropology. The purpose and goals follow to provide evidence for this statement.

Purpose:

The purpose is to provide methodologically generated linguistic data to confirm or cast doubt upon theories about language.

Goals:

A. To generate relevant or non-trivial linguistic data.

B. To generate valid linguistic data.

C. To generate linguistic data which can be replicated.

The major methodological conclusions of this investigation are that the first step in building a methodology to collect linguistic data has been taken. Other efforts are required to contribute to this and other methodologies "to confirm or cast doubt upon theories about language." Within the methodology, a formula was developed which concisely summarizes the requirements for the Interview, a particular means of collecting linguistic data. Mehta Formula Interview #2 is flexible in that it can be adapted and revised according to the needs of different researchers.

The substantive and methodological implications of this investi-
gation will be jointly considered. These will be recommended from the point of view of the interests of this methodologist. Draft III of "Mehta Methodology to Collect Linguistic Data" could be applied in carrying out another investigation of this area of ambiguity to provide a better idea of the perception of this ambiguity held by adults and of the stages through which children progress, and the modal ages at which each stage is attained.

In applying Mehta Methodology the purpose could be twofold. The first would be to further explore the same theoretical area of ambiguity. The second purpose would be to test the hypothesis that this type of ambiguity is not ordinarily perceived by the speaker/listener in order to maximize the communication process. To state it obversely, although the speaker/listener has the abstract competence for recognition of such ambiguity he/she refrains from doing so to minimize confusion for ordinary purposes of communication.\(^1\) The rule for the transformation of the possible meanings of this ambiguity is: eliminate confusion by selecting underlying structure appropriate for the context; create a context in the absence of one. To test this hypothesis, Interview-Ambiguity would be used for two adult samples. In one presentation of it, using the same stimulus materials of the present study no changes in instructions to the subjects would be made. For the other application, the subjects would

\(^1\)So fundamental is this rule that even when there is no context, unconsciously a context is devised and assumed by the speaker/listener. It is theorized that this is what took place with the stimulus material in the application of Interview-Ambiguity.
be notified that the rule to eliminate confusion need not be applied. The Interview was initially designed to be unobtrusive in regard to the purpose of the investigation. Thus the second group would be told that they should be on the alert for as many meanings in the interpretation of the stimulus material as possible. It is hypothesized that for the unchanged version of Interview-Ambiguity, most subjects would detect only one meaning for the stimulus materials in parts "Exploration," "Expansion," and "Sentence Completion." For subjects who are alerted of the presence of ambiguity, most would detect its existence.

Continuing with suggestions for this investigation in regard to the acquisition of the rule: eliminate confusion by selecting underlying structure appropriate for context; create a context in the absence of one. Two samples of children would be selected for each year from 7 years 6 months to approximately 14 years of age, or the onset of puberty to determine at what point the classified linguistic data approximates those data found for adults.\(^1\) This study would be conducted as the one just described. Here the purpose of the investigation would be to determine at what point the rule is acquired.

\(^1\)Lenneberg states: "... puberty marks a milestone both for the facility in language acquisition and a number of directly and indirectly related processes in the brain. We are, therefore, suggesting as a working hypothesis that the general, nonspecific state of maturation of the brain constitute prerequisites and limiting factors for language development." Eric H. Lenneberg, Biological Foundations of Language (New York: John Wiley & Sons, 1967), 168-69.
These suggestions seem to be the most appropriate for immediate investigation but other ideas also come to mind. For instance, to test the hypothesis that for other types of ambiguity the proposed rule is also applied by the speaker/listener. To do this, varied types of ambiguity could be explored in several languages using Mehta Methodology with the necessary changes required to incorporate differing stimulus material and the same research design as previously discussed. A question that could be explored in these investigations is:

What are the commonalities or linguistic universals in the ways this rule is characterized within a language and between languages for varying types of ambiguity?

In addition, longitudinal studies for the purpose specified should provide linguistic data which could be used to explore other areas of investigation. One area could be in the formulation of a hypothesis regarding the selection of the particular underlying structure for Stage II for varied types of ambiguity. As was indicated earlier the children selected differing underlying structures but the rationale for the particular selection was not explored.

Certainly there are more ideas which could be pursued in this area which have not been touched upon. Through continued use and development of Mehta Methodology and other methodologies the pursuit of collecting linguistic data in this and other areas will "confirm or cast doubt upon theories or hypotheses about language."
Addendum

A more recent search of some of the literature (36, 37, 39) suggests that the "state of the art" of the investigation of language acquisition remains the same in respect to methodology, as it has been defined in this dissertation. Researchers continue to utilize a variety of methods which can be improved upon as argued in this study. The article by Susan Ervin-Tripp is a review of some of the recent literature representing no concern regarding the advance of methodology (37).

Finally, the author is unaware of any investigation in language acquisition in the area of ambiguity as was pursued for this dissertation. According to Kessel, he was the first to pursue the investigation of ambiguity as it relates to language acquisition (38).
CHAPTER V

EDUCATIONAL IMPLICATIONS

This final Chapter is divided into two parts. The first portion is a summary of an article by linguist Peter Rosenbaum. The second part presents the methodologist's view of some educational implications of Mehta Methodology to Collect Linguistic Data and of the analysis of ambiguity.

While little of quality has been written on the educational implications of linguistics, the article by Rosenbaum reflects a perceptive analysis of the teaching of English grammar combined with a skillful application of linguistics to the area.

Rosenbaum provides a framework for a consideration of some ways in which transformational grammar can be used in the teaching of English. His areas of consideration are:

a. the content of the English curriculum,

b. the evaluation of certain traditional criteria employed in the evaluation of composition, and

c. a possible explanation for the continuing lack of correlation in grammar and improved performance in the literate skills.

In a consideration of "(a) the content of the English curriculum," the author indicates that "normative values" in the use of language are sought. However, such behavior goals are not a rational argument for any particular value within the linguistic description itself. Further, it has been demonstrated that instruction in grammar has little effect on the performance of literate skills. Finally, regarding "normative values" of language use, no particular description of language follows by inference for such a goal. It is thus concluded that there is the absence of a compelling link between normative criterion and a particular linguistic description approach. There is also no built-in basis upon which to select a linguistic description.

Rosenbaum goes on to discuss other rationale for the inclusion of transformational grammar in an English curriculum. He indicates that the goals of transformational grammar are nontrivial ones concerned with human intellectual capacity. This science of transformational grammar addresses itself to questions that have long been of concern to intellectuals and scholars. Further, the fact that it is presently a dynamic field of investigation can provide for classroom discussion on unresolved issues.

The author next takes up the area of "(b) the evaluation of certain traditional criteria employed in the evaluation of composition." He presents the idea that in using traditional approaches for purposes of evaluation of writing, one is not provided with the necessary
specific criteria for such criticism. In contrast, the application of rules of generative grammar gives substance to decisions regarding acceptability of compositions. An example of an ambiguous sentence and a consideration of it from the viewpoint of generative grammar follows:

(1) Joshua commanded the children to shout forcefully.

Rosenbaum describes the complexity of the problem.

If . . . [the student] wishes to disambiguate sentence (1) in such a way as to specify the interpretation of this sentence in which the adverb "forcefully" modifies the complement verb "shout," he must break the adverb placement rule thereby producing a split infinitive construction. If, on the other hand, the preservation of grammaticality is the student's primary concern, then sentence (1) must remain ambiguous.

. . . the logical dilemma exists and it becomes clear that, short of ruling all infinitival constructions out of English, a poor compromise, either the canon of clarity must be weakened or the split infinitive must be accepted into the domain of fully grammatical constructions.1

Here the student has some rules upon which to deliberate. A rational decision then becomes possible in contrast to one which is made in the absence of evidence.

The last area considered by Rosenbaum pertains to "(c) the possible explanation for the continuing lack of correlation between instruction in grammar and improved performance." This issue is considered by the linguist by first presenting examples of "acceptable" and "unacceptable" sentences. Then the problems with

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1Ibid., p. 478.
which one is confronted in trying to deal with bringing about changes from an "unacceptable" to "acceptable" dialect are considered. The examples given follow:

6 (a) Mary would hate for the boys to arrive early.
6 (b) Mary would hate the boys to arrive early.

7 (a) Does your mother dislike your brother's coming home late?
7 (b) Does your mother dislike your brother coming home late?¹

The linguist points out that the surface characteristics of 6 (b) and 7 (b) do not appear to be related. However he goes on to state that "for" in 6 (b) and "'s" in 7 (b) share the same position in the underlying structures and are deleted by the same transformation. Thus 6 (a) and 6 (b) are related in the same way as are 7 (a) and 7 (b). But the problems encountered in trying to bring about behavioral changes are complex. First, if only the problem of the deletion of "'s"is considered, then the continued deletion of "for" in sentences such as 7 (b) serve as a reinforcement of usage opposite to the desired goal. Rosenbaum points out further complexities which must be dealt with to bring about changes in verbal behavior.

... Three other factors make this problem even more complex. First, it may well be that the teacher will consider the syntactically related linguistic forms to be fully grammatical, in which case the probability of producing contradictory behaviors is quite high. In other words, "for" may be deleted in every infinitival complement construction which the teacher utters. Second, it is folly to assume that the linguistic environment outside of the

¹Ibid., p. 479. (The same numbering of Rosenbaum is used to allow the reader to refer to his text with ease.)
classroom could be appropriately controlled to any significant degree. Finally, and perhaps most problematical, it is not impossible that other rules in the speaker's grammar which are requisite to the production and comprehension of sentences whose grammaticality is beyond question will reinforce the rule which deletes "for" and "'s".* In this eventuality, the only way out is an absurdity; to eliminate the reinforcing transformations by somehow ruling the grammatical sentences requiring these rules out of English.¹

Rosenbaum concludes by saying that in generative grammar there is considerable evidence that must be taken into account for its role in the English curriculum. However, certain specific implications for pedagogy must await a more "... explicit account of the linguistic rules which characterize linguistic behavior ... "

We will next consider the implications of both Mehta Methodology to Collect Linguistic Data and the particular area of ambiguity investigated from the viewpoint of "(a) the content of the English curriculum."

By presenting Mehta Methodology to Collect Linguistic Data to students, they would become privy to a methodological approach (as defined by Hutchinson) for the collection of linguistic data. Also providing the opportunity to administer parts or all of Interview-Ambiguity would be comparable to experiments in other science courses. Encouraging students to develop their own Interview No Name


¹Ibid., p. 480.
and subjecting it to pilot testing could contribute to simulating classroom efforts in exploring both generative grammar and the understanding of methodology.

Another possible application of this research in the classroom could be the initiation of a discussion of the suggested stages of the development of ambiguity to serve as a catalyst for an exercise in hypothesizing about the stages of acquisition for ambiguous and other materials.

These suggestions are ones which would obviously be applicable beyond the early school years. However this research is also of value to the elementary school teacher. For example, the results of the work of Berko, C. Chomsky and of this study on ambiguity provide a framework for the teacher to speculate about language acquisition. An increasing pool of linguistic knowledge combined with the bits and pieces of teachers' observational data on language behavior can potentially provide educators with a viable rationale for both a framework for language arts programs along with a resource which could be used by methodologists who wish "... to confirm or cast doubt upon theories or hypotheses about language."

The reader will very probably have additional ideas which could be added to these suggestions for educational implications. Hopefully each reader will contribute to this list, even more optimistically, perhaps some notions will be applied and students will benefit.
I. Put methodologist in contact with problem using one of two methods:
   A. Simple method -- use interests of the methodologist
   B. Complex method -- use Coffing Client-Demand Methodology

[N.B. If at any time you find yourself reading any of the steps below and nothing is happening, try the following four steps:

1) Identify all the roles necessary in this use of Metamethodology.
2) Define these roles.
3) Determine the sequence in which the roles should be taken on by the user.
4) Do each of these roles in the sequence determined above.]

II. State the purpose by analyzing the area and determining a purpose that will solve the problem.

A. Investigate the problem area.
   1. Read the literature in the area.
   2. Talk to people who work in the area.
   3. Examine work being done in the area.
   4. Brainstorm about the problem area.
   5. Try out tools that already exist in problem area.

B. Narrow down area into manageable piece (focus).

*The reader will note various errors; they are the responsibility of the original author.
C. Investigate purposes within the chosen piece of the problem area.

1. Brainstorm purposes that will solve the chosen problem.
2. Read the literature applicable to the chosen problem.
3. Ask others for purposes they think will solve the chosen problem.

D. If more than one purpose has resulted from the previous step, then choose the most appropriate one.

E. Check chosen purpose against following two criteria:

1. Check purpose to see that it is not trivial.
2. Check purpose to see if it really solves the problem you have in mind.
3. If purpose fails to meet one of the above criteria, revise it until it meets them both.

F. If resources warrant, show purpose to others for their critique based on the above two criteria.

G. Write out purpose and commit yourself to it. (If you can say why you don't like it, then revise and recycle to E. If you can't say why you don't like it, then go on to Step III.)

III. Test purpose by the following criteria:

A. Is purpose desirable?

1. Use one of the following methods -- where not obvious use Complex Method.
   
   a) Simple Method
      
      i) Answer question yourself with rationale
      ii) Get diverse groups to answer question
      iii) Check notes from previous literature review and check any other literature on the area to see if purpose is desirable.
b) Complex Method -- use Coffing Client-Demand Methodology

2. Revise the purpose if necessary.

B. Is the purpose operationalizable?

1. Use "Operationalization of Fuzzy Concepts"
   
   [N.B. It is not necessary to do a complete operationalization at this point. It is only necessary to find if the purpose can be operationalized.]

2. Check A in light of operationalization and revise if necessary.

C. Is purpose practicable?

1. Answer question yourself in terms of
   
   a) Is the development of a methodology practical given this purpose?
   b) Is the methodology once developed a practical way to accomplish the purpose?

2. Get diverse groups to answer question.
   
   a) Methodologists answer question of C.1.a)
   b) Methodologists and potential users answer question of C.1.b)

3. Revise the purpose if necessary and recycle through A and B; otherwise go to D.

D. Are existing methodologies insufficient?

1. Test in following way:
   
   a) Search area for existing methodologies.
   b) Take found methodologies and test them against definition of methodology. If they all fail go to Step IV.
   c) Are they designed to accomplish your purpose? If not go to Step IV.
d) Does any one of them accomplish your purpose? If not go to Step IV.

e) Are these practical? (See if they are used.) If not go to Step IV.

f) Are they desirable? If all are not, go to Step IV.

g) Is any one complete? (You may work on it if it is not.)

2. Revise the purpose and recycle through tests if necessary.

IV. Once all answers to III are yes, then analyze implications of the purpose for the development of methodology. (This is a way of identifying the attributes that the methodology must have.)

A. Use following method to analyze implications. (Hutchinson says "Problem implies its own solutions." In this case, the implications of the purpose supply first approximation of gross methodological elements.)

1. a) Imagine and write down in what ways you could fail to accomplish the purpose.

b) Imagine and write down in what ways you can accomplish the purpose, avoiding all problems.

c) Imagine the purpose being accomplished; write down what is happening.

d) i) For each element determined through b + c, determine all possible alternatives to accomplish the purpose.

ii) Create one list from all the lists generated in the previous step. For those dimensions generated in a., change their statements so that they state a procedure or procedures to solve the problem they originally identified.

iii) Test the completeness of the above list by using one or more of the following methods to generate alternative lists of dimensions. Then examine these new lists. For each dimension not on the list produced in d.ii) above that you want on that list, add it to the list.
Add any other dimensions to the list that you think of while doing this process which are not already on the list and which you want on the list.

1) Ask others to do steps a - c.

2) Think up alternatives which have nothing to do with this purpose and consider whether they do or not.

3) Go back to list generated in b and c, and consider again whether any of those should be on list and add any new ones.

4) Ask yourself if your alternatives have any alternatives to them.

5) Ask what bad alternatives exist that are not on this list and how they could be changed to good alternatives.

6) Use the possible methodologies generated in Step III.D.

7) Use any other tests of your own choosing.

2. Choose the initial set of major processes for the methodology.

   a) Look over the list of dimensions and choose those which you feel will accomplish the purpose.

   b) Combine together any dimensions that appear to go together.

   c) Write out a new list with any combined dimensions listed together.

B. Organize the attributes into a rational order of steps.

1. Determine which implications are not necessary for the methodology (accomplishing purpose) and strike them from the list.

2. Determine which implications are contained in others and note that. Determine which implications can be combined to make one step, and give those a name.
a) Combine any dimensions on the list which are related and define a single process when combined but are not logical substeps of each other.

b) Create a major step naming this process and list the combined dimensions as substeps of this.

3. Ask which implication you would have to accomplish first in order to accomplish the rest.

4. Write it out as first step.

5. Ask which implication would now be first, given that the first one is accomplished.

6. Write it down as second step.

7. Do this process until all major implications are accounted for.

8. Order any substeps by cycling through 3 - 7.

9. Check to see if order has logical flow to it.

10. Check to make sure all implications are stated procedurally.

11. Write out a revised list.

12. Check completion of ordering by asking others (at least one) to give an ordering of implications with explanation of why, if possible, without showing them your ordering. This can be verbal or written, depending on the resources available.

13. Do a revised ordering based on responses from 12.

14. Give revised ordered list to others experienced in problem area for critique.

a) Write out purpose of methodology.

b) Write out following statement:

Please critique the list of steps designed to accomplish the above purpose and point out those steps that you do not understand, steps you feel should be left out, and any steps, concepts and/or ideas that you feel should be added.
c) Present a copy of the above two statements along with a copy of the steps to each of the individuals who will critique these steps.

15. Do a final ordering and write it out.

C. Add in any steps or functions that are implied by the existing steps at the same level of abstraction.

D. Identify anchoring steps for methodology.

1. Putting methodologist in contact with problem.

2. Testing whether methodology has worked (then recycle).

E. Write out final list to be used throughout rest of methodology.

V. Operationalize the purpose.

A. The straight analysis technique

1. Identify the fuzzy concepts in the purpose.

2. Directly operationalize each fuzzy concept.

3. Directly operationalize the interaction among fuzzy concepts.

4. Test the criteria for completeness in a manner of your choosing and revise them if necessary.

B. Review the final set of components. If you are unsatisfied go to C; otherwise commit yourself to the set of components and go to Step VI.

C. Revise the components. If you are still unsatisfied go to D; otherwise commit yourself to the revised set of components and go to Step VI.

D. Use Hutchinson's "Operationalization of Fuzzy Concepts."

VI. Design Procedures

[N.B. Design or redesign can be done at any level of breakdown, including the highest.]
A. Identify the first (next) step to be designed (i.e., the first crucial step where it is not clear that the step would be easy to develop).

1. Examine each step of the initial draft of the methodology for gaps.

2. When a gap is found, determine if it is crucial. Use the operationalization of the purpose as criteria to determine if the gap is crucial.

3. If the gap is not crucial, go back to 1. and continue to examine; otherwise go to 4.

4. Determine if gap is hard to develop.

   a) Answer this question: When I read this step does it convey to me what must be done to accomplish it?

   b) If the answer is no, go to B; otherwise go to 5.

5. Cycle back to 1. If no gaps were found that fit both criteria then identify "crucial" gaps and develop those. If no "crucial" gaps were found then develop any gaps.

B. Identify the step's subpurpose.

C. Analyze implications of subpurpose in terms of main purpose.

   a. Use the following method to analyze implications of the subpurpose:

      1. a) Imagine and write down in what ways you could fail to accomplish the purpose.

         b) Imagine and write down in what ways you can accomplish the purpose, avoiding all the problems.

         c) Imagine the purpose being accomplished; write down what is happening.

         d) i) For each element determined through b + c, determine all possible alternatives to accomplish the purpose.
ii) Create one list from all the lists generated in the previous step. For those dimensions generated in a., change their statements so that they state a procedure or procedures to solve the problems they originally identified.

iii) Test the completeness of the above list by using one or more of the following methods to generate alternative lists of dimensions. Then examine these new lists. For each dimension not on the list produced in d.ii) above that you want on that list, add it to the list. Add any other dimensions to the list that you think of while doing this process which are not already on the list and which you want on the list.

1) Ask others to do steps a-c.

2) Think up alternatives which have nothing to do with this purpose and consider whether they do or not.

3) Go back to list generated in b and c, and consider again whether any of those should be on list and add any new ones.

4) Ask yourself if your alternatives have any alternatives to them.

5) Ask what bad alternatives exist that are not on this list and how they could be changed to good alternatives.

6) Use the possible methodologies generated in Step III.D.

7) Use any other tests of your own choosing.

2. Choose the initial set of major processes for the methodology.

   a) Look over the list of dimensions and choose those you feel will accomplish the purpose.

   b) Combine together any dimensions that appear to go together.
c) Write out a new list with any combined dimensions listed together.

b. Organize the attributes into a rational order of steps.

1. Determine which implications are not necessary for the methodology (accomplishing purpose) and strike them from list.

2. Determine which implications are contained in others and note that. Determine which implications can be combined to make one step, and give those a name.
   
   a) Combine any dimensions on the list which are related and define a single process when combined but are not logical substeps of each other.
   
   b) Create a major step naming this process and list the combined dimensions as substeps of this.

3. Ask which implication you would have to accomplish first in order to accomplish the rest.

4. Write it out as first step.

5. Ask which implication would now be first, given the first one is accomplished.

6. Write it down as second step.

7. Do this process until all major implications are accounted for.

8. Order any substeps by cycling through 3 - 7.

9. Check to see if order has logical flow to it.

10. Check to make sure all implications are stated procedurally.

11. Check completion of ordering by asking others (at least one) to give an ordering of implications with explanation of why, if possible, without showing them your ordering. This can be verbal or written, depending on the resources available.

12. Do a revised ordering based on responses from 11.

13. Give revised ordered list to others experienced in problem area for critique.
a) Write out purpose of step under development and methodology.

b) Write out following statement:

Please critique the list of steps designed to accomplish the above purpose and point out those steps that you do not understand, steps you feel should be left out, and any steps, concepts and/or ideas that you feel should be added.

c) Present a copy of the above two statements along with a copy of the processes of the step under development to each of the individuals who will critique these processes.

14. Do a final ordering and write it out.

c. Add in any steps or functions that are implied by the existing steps at the same level of abstraction.

d. Identify the anchoring steps for the step under development at this time.

e. Write out final list to be used throughout rest of methodology.

D. Determine the amount of completeness and test for it.

E. Examine the logic of the step under design in terms of subpurpose and main purpose.

F. Fill in the gaps that are found and then recycle to VI.E. If no gaps, go on to VI.G.

G. Examine the logic of entire methodology and its parts in terms of main purpose in light of the step under development.

H. Redesign step and/or methodology and recycle to VI.G. If no gaps, then go to VI.I.

I. Recycle to VI.A. until you feel that further applications of VI will not produce sufficient improvement to warrant spending of resources.

J. Before going to VII, write out a new draft of the methodology including all changes made to date as a result of VI.
[N.B. One may conduct a field test as well as running through VI by using the data obtained in the field test to help out in the development procedures.]

VII. Test and then revise the purpose and/or procedures if necessary.

A. Field test the methodology.

1. Determine what is to be field tested--a part of the methodology or the entire methodology.

2. Determine the simplest field test not already done on the subject of the field test.

3. Write out the purpose (of the methodology or the part to be tested) and its operationalization.

4. Determine your goals for the field test. If this is not easy to do, use Goals Process from the Fortune/Hutchinson Evaluation Methodology.

5. Develop the measures for the field test from the operationalization of the purpose and your goals. If this is not easy to do, use the Measuring Process from the Fortune/Hutchinson Evaluation Methodology.

6. Do the field test and carry through the observations.

7. Use the data to revise the methodology or the part by recycling to Step VI.

B. Conclusion-oriented research of methodology; if necessary, redesign (use Step VI).
APPENDIX II-B

META-METHODOLOGY: AN OVERVIEW OF WHAT IT IS AND HOW IT WAS DEVELOPED* †

by James Thomann

Methods and methodologies have been developed over the years to do many different things. Scientists - behavioral and physical - Engineers, Businessmen, laborers and even Teachers used methods to accomplish their purposes. Through the use of methods jobs are made easier to do, and better more consistent work is done.

For example, the physical scientists have the "Scientific Method" for doing research and establishing the results as knowledge. Any research that violates these methods is not accepted as valid by the particular scientific community. Another example of the use of methods comes from the field of Education. In order to earn a certificate to teach in either primary or secondary schools, a student usually has to take prescribed methods courses such as methods of teaching science, social studies, math and English. These courses usually attempt to show the students how to impart the subject matter to their students. Methods, good methods or bad methods, are constantly used by teachers.

There are many more examples of methods and methodologies being used or needed. In general there doesn't seem to be any field, job or area of endeavor that does not lend itself to the use of methods. For example, in the past ten years a new field has been created.

†The reader will note various errors; they are the responsibility of the original author.
This field is Futuristics. When the different aspects of this field were being explored, one of the most prominent divisions, where there was and is a great need, is the area of methods. This division supplies those things which are necessary in order to do futuristics.

Education, right after the Russians put Sputnik into orbit, heard a great call for more and better scientists in all areas of the physical sciences. In response to this call new curricula in physics, biology, math and other fields were developed and disseminated. These curricula, not only included the subject matter, but also included methods to get across the subject matter. For example, PSSC physics emphasized the use of the lab to help the students learn the subject matter.

There is a difference between methods and methodologies. Methods are rules or procedures that guide someone in accomplishing a purpose. Methods consist of "rules of thumb" or "guidelines." Methodology, on the other hand, is a series of operational steps that accomplish a specific, definable purpose. The difference is that a methodology provides a specific, well-defined route that accomplishes the purpose while the method only supplies a possible route that is not well defined. A method only supplies direction to the user and leaves a lot for the user to supply; a methodology attempts to supply as much as possible to the user as far as operational procedures and sequence are concerned.

In the previous examples, one is dealing with methods rather than methodologies. The "Scientific Method" does not meet the defini-
tion of methodology because it does not present a series of operational steps, but a general set of steps that only gives the user the main steps in doing research. Teaching methods are only generalized approaches to teaching. At no time does a teaching method prescribe a specific behavior that the teacher should use in a specific situation. A methodology attempts to fill in all the missing pieces and thereby be able to prescribe what behavior is needed when.

Furthermore, a methodology can be looked at as an abstract but operational solution to a class of problems. It is abstract because it does not supply a specific solution to a specific problem but it supplies the means by which that specific problem is derived. It is operational because the steps by which the specific solution is determined are as prescriptive as possible. A methodology deals with a class of problems. Any specific problem has particular characteristics that makes it similar to other problems. The steps of a methodology are designed on the general problem. In application, by accounting for the particular circumstances, a specific situation is designed for a specific problem. It is in this way that a methodology is an abstract but operational solution to a class of problems.

The need for methodologies has never been strongly perceived. This could be because methods are so much a part of what we do that we take them for granted. But the need is there and it is strong. With the way things keep changing either new or improved methods are needed. Occasionally this need is strongly perceived as happened in Education after Sputnik.
But in this proliferation of methodologies there has never been a methodology that provides for the development of, and research into, methodologies. In the past, any person who wanted to develop methodologies simply depended on his intuitive understanding of methodologies and his creative abilities. Given the low perception of need, and the fact that any method is better than none this lack of a conscious methodology for the creation of methodologies never appeared to be a hinderance. As a matter of fact in this absence a type of engineering came about whose practitioners were actually developers of methodologies. This field is industrial engineering. An industrial engineer develops methods to produce a better product in a more efficient way, thereby optimizing as much as possible the use of available resources.

Certain occurrences have pointed to the need for a methodology to develop and research methodologies. These occurrences include the need for an effective Evaluation Methodology and a Client Demand Methodology. The need for an Evaluation Methodology based on the purpose to provide data for decision-making has been documented by Larry Benedict (U. Mass., 1971). The need for a Client-Demand Methodology based on the purpose to determine client demand for public services has been documented by Richard Coffing (U. Mass., 1971).

In attempting to fill the need for an Evaluation Methodology, the Fortune-Hutchinson Evaluation Methodology has been conceived and is being developed by Dr. Jimmie C. Fortune, Thomas E. Hutchinson et al. In attempting to communicate how to develop and research this.
Evaluation Methodology the lack of an effective methodology to develop and research methodologies was perceived. This became even more evident when one attempted to learn or to teach how to develop and research methodologies.

It was to fill this gap that Dr. Hutchinson conceived of the concept of Metamethodology. This methodology has the purpose to develop and test a methodology for a specific, definable purpose. The first step taken was the conceptualization of the seven basic steps of Metamethodology. These were determined by Dr. Hutchinson and presented first by Richard Coffing in his dissertation proposal (U.Mass., 1971) which was concerned with the development of a Client Demand Methodology. These seven steps are:

1) State the Purpose
2) Test the purpose by criteria such as
   a. Is it desirable?
   b. Is it operationalizable?
   c. Is it practicable?
   d. Are existing methodologies insufficient?
3) If the answers are affirmative, then analyze the implications of the purpose.
4) Operationalize the purpose
5) Design procedures
6) Test the procedures
7) Revise the purpose and/or procedures, if necessary.

The next step of development came when Dr. Hutchinson and James Thomann decided to develop the methodology further. The reason
for this undertaking was the desire of James Thomann to be able to develop and test methodologies and also be able to teach others to do the same. Since the above seven steps were all that existed of Metamethodology, it was determined that the development of Metamethodology was necessary in order to train other methodologists.

A two-part process was chosen to develop Metamethodology. First, the two developers decided to use the existing steps to develop a methodology on a given purpose. Wherever there was no specific procedure spelled out in Metamethodology, the developers would document as best they could the things they did to accomplish that particular step. After some study, both of areas of interest and for methodology in these areas, the area of Futuristics was chosen and the purpose determined for the methodology was to provide information and data to decision makers on the consequences of the alternatives they face.

The second part of the development process was to use the existing steps of Metamethodology to fill in gaps in the Metamethodology itself. This was a process of using what existed of Metamethodology to develop itself. In this process the circular nature of Metamethodology is easily seen. This entire combined process has been compared to the process of evolution and because of its success, the developers have tried to make it an integral part of Metamethodology. This part is a combination of Field Test and Conceptual Development.

Five subsequent drafts of Metamethodology have been written since the first seven steps. In addition, there have been two drafts of
the Future's Methodology produced. The sixth draft of Metamethodology is described in the following pages and the complete methodology (Draft I) is attached as an appendix. Also attached as an appendix is the latest draft of the Future's Methodology.

Metamethodology has changed somewhat in its basic steps. There are still seven steps but through combination a number of steps have been put together and a couple of others added. Furthermore, all the steps have been expanded. It would be a mistake to say that Metamethodology is complete. There are still gaps to be filled, but the basic makeup of Metamethodology appears to be complete and only the further operationalization of the steps seem to be needed.

Previously it was mentioned that a methodology is an abstract but operational solution to a class of problems. Given that this statement is fact, then Metamethodology is an abstract but operational solution to the class of problems: all definable problems. The class of problems is all definable problems since Metamethodology provides for the development and testing of methodologies for any class of definable problems and therefore is a solution for all definable problems. The one constraint on Metamethodology is that the class of problems must produce a definable purpose, which when accomplished solves the problem.

There are three things that are necessary to produce the best possible methodology for a definable purpose: 1) the determination of the purpose; 2) the development of the steps that make up the methodology; 3) the testing of the methodology to see that it indeed
accomplishes the purpose. In the seven steps Metamethodology (Draft VI) accomplishes the three things listed above. What follows then is an explication of the seven steps of Metamethodology. Each step will be described conceptually, but no attempt will be made to totally describe each step since the complete methodology is an appendix to this paper.

The first step is to put the methodologist into contact with the problem. This step identifies in one of two ways the area in which a methodology is needed. The simple way is to use the interests of the methodologist and the complex method is to do a Client Demand Study using Coffing's Client Demand Methodology.

Step II is to determine the purpose around which a methodology is to be developed. This is accomplished by doing as thorough an investigation of the problem area as is possible. In doing this investigation, the nature of the problem area to be determined. By determining the nature of the problem area one has begun to identify what it means to work in the area. From this process, one can then determine a purpose for which to build a methodology in order to solve the problem. At this writing this step is one of the least developed steps of Metamethodology. There is no process of investigation that the developers feel is superior to any other. For that matter, no specified process yet exists for this activity.

In step III the purpose is tested against four criteria. The first criteria is desirability. By this criteria, one attempts to determine if the methodology developed around the purpose will ac-
complish something people want and will use. For if the purpose is undesirable then producing a methodology that will accomplish this purpose might be a waste of time.

Operationability is the second criteria. By this criteria, it is determined if the purpose can be made operational and thereby be totally understood. It is not necessary to operationalize the purpose at this time, but only determine if it can be made such since an operational purpose is necessary for later stages of the methodology, and since a purpose that is not operational may be unsolvable.

Next, one determines if the purpose is practicable. Practicability, first, calls for a determination as to whether a methodology can be developed, given the resources available for the development. It might be unwise to begin work on a methodology when there are not sufficient resources to complete the developmental tasks. Secondly, practicability calls for the determination as to whether the methodology implied by the purpose can be applied practically, once it is developed. If the methodology cannot be applied practically then there is a good chance it can not be used or will not be used.

The final criteria against which the purpose is tested is the insufficiency of existing methodologies for the accomplishment of that purpose. This criteria is used to make sure that time and resources are not wasted developing and testing a methodology for the chosen purpose that does the same thing in a way it accomplishes the purpose or in that it does not do a better job of accomplishing the purpose than existing methodologies designed for the same purpose.
This criteria can also help save time and resources by identifying gaps in the existing methodology. If any of the above criteria do not test positively then the purpose is reworked or all work on the methodology halted, depending on the extent of the risk, and resources available to the methodologist.

The fourth step of metamethodology is designed to produce the skeleton outline of the methodology. After the completion of this step one can have a pretty good idea of what the final methodology will look like. First, the methodologist analyzes the implications of the purpose and then organizes these implications into a rational order of steps. This is done because it produces the first approximation of the gross methodological elements, for as Dr. Hutchinson said, "Every problem implies its own solution." (1971) The methodologist would then add in any necessary steps that are on the same level of operationalization, but were not part of the implications. This is done because there is no guarantee that the implications will produce the entire skeleton. For example, transitional steps might be needed in order to make the methodology workable. Finally, the very first and very last steps are determined and added the methodology if they are not already there.

Next, the methodologist operationalizes the purpose if it was not done in step III above. This is necessary in order to carry out the last two steps of Metamethodology. Since the last two steps provide for the full development and testing of the methodology, objective criteria are needed against which to judge and test the
methodology. By operationalizing the purpose the methodologist precludes the necessary criteria. This is why it is so important to test the purpose for operationalizability, since otherwise it would be difficult to produce the necessary criteria at this step.

Step VI provides for the further design of the methodology. Through this step at least one, if not most, of the gaps of the methodology are filled. The step is divided into two basic sections with a recycling component. The first part is to identify a gap (gaps) and design the steps to fill it. These substeps are designed by determining a subpurpose to fill the gap and then by analyzing the implications of the subpurpose the substeps are developed. The second part of the step provides for a logical testing of the newly developed substeps in terms of their internal logic of the developed substeps and in terms of the whole methodology by using the criteria produced in step V. It is important that both logical tests are passed, since it can not be just assumed that the newly developed steps will be logically consistent. The recycling component provides for the steps under development to got through redesign until they appear to satisfy the criteria. And it also provides for the methodology to be recycled until either all the gaps are provided for or until the methodologist feels he cannot sufficiently improve the methodology to warrant using any more resources on this step.

Finally, Metamethodology provides for field testing and conclusion-oriented research of the methodology. A field test is a controlled use of the methodology that provides data for further design
or redesign of parts of the methodology. Conclusion-oriented research is the testing of hypotheses about the methodology. Again, these are done in terms of the criteria produced in Step V. This step also has a recycling component. The recycling puts the methodology back into step VI to solve the problems identified by the testing or research.

At this point in time there is no rigidity in the order of steps. For example, Step V can be done when it is needed since some methodologists might find it more appropriate to do this step earlier or later than specified. Even though rigidity is not there, it is recommended that the methodologist follow the methodology unless his experience determines a better way. One reason that this lack of rigidity exists is because Metamethodology is still under development.

Furthermore, it should be noted that Steps VI and VII can be going on simultaneously. This can be done because step VII can help the methodologist identify the gaps and step VI provides steps that can be tested by step VII to assist in the development of these steps. Research, either field testing or conclusion-oriented, can be done on any part of the methodology as well as on the whole. As was previously mentioned it is this simultaneous use of steps VI and VII that has helped develop Metamethodology and is also being used quite successfully in the development of the Fortune-Hutchinson Evaluation Methodology.

The development of Metamethodology is a significant breakthrough in the field of methodological research and development. It not only
provides the procedures by which methodological research and development are done, but it also provides a definition or understanding of the field. Until now training in the field was almost nonexistent, but with Metamethodology the training of methodologists becomes a real possibility.

In conclusion it should be remembered that Metamethodology is not yet finished. There are still gaps to be filled and research to be done. Some of the more notable gaps, although not necessarily the most important, are steps II and VII. More work and further research are necessary. The developers, though, do believe that a workable methodology is now in existence and with the additional work Metamethodology will achieve the goal of being able to produce the best, most efficient processes to accomplish purposes.
APPENDIX II-C

INTERVIEW-AMBIGUITY

The purposes of the Interview are twofold. They encompass the expansion of knowledge in language acquisition and the development of a means of collecting valid linguistic data. The Interview is made up of parts which are directed toward these purposes. In the instructions for Interview-Ambiguity, the stated purpose for each part will pertain only to the requirement for the collection of valid linguistic data. This will be described in terms of "checks" which are required as the means for data validation.

Part: Riddles

Explanation

Purpose. The purpose of the part "Riddles" is to provide information which will allow for both a corroborative and reliability check with the first presentation of the part "Exploration." The corroborative check is made to determine if there is a parallel between the classifications\(^1\) of the responses to the riddles and the grammatical classifications\(^1\) made of lexical items for responses to stimulus sentences in "Exploration." The reliability check is to provide evidence of understanding or correct classifications for at least two riddles.

\(^1\)Classifications are initially referred to in "Example of Interview-Ambiguity," Draft I in Chapter III.
Description of Stimulus Material. The nine riddles of this part are considered (by the methodologist) to be ambiguous. That is, to unravel the riddle or to determine the reason why they're funny requires the detection of the dual meanings of a word or phrase.

Procedure. Present riddles in the numbered sequence as indicated below. After each riddle, provide a brief pause. Give the answer if the child doesn't supply the one specified. If the child indicates in any way that a riddle has been previously heard, disregard the responses to the riddle. This is to rule out the possibility of explanation of the riddle given by an adult. Questions and comments will often be needed to encourage the child to explore the combined meanings contained in the riddle. The interviewer must help in exploring the meaning without giving the answer away. This process must be continued so long as the child is willing. The interviewer must then move on to the next riddle. Continue giving the riddles until at least two riddles are classified as correct or until all riddles have been given. The riddles can be repeated any number of times for any reason.

Classification of Responses. Classify an answer as correct when the child indicates (orally) an awareness of two meanings of a word, phrase or idea of the presented riddle. As indicated in the procedure, the interviewer must probe carefully to get responses when they are not spontaneously forthcoming.

Example of Classification of Responses. Response to Riddle #4: Child:
You can measure with feet. You also use feet to stand on. This is classified as correct. There is evidence of two interpretations of "feet."

**Interview Procedure Using Riddles as Stimulus Materials**

**Interviewer (oral):**

I would like to talk to you about some things. First let's share some riddles. I have some that I think you'll like. (See list of riddles. After each riddle is presented to the child, supply some part of the following statement.) Now I'd like for you to explain why the riddle is "funny," why it seems to be a "good one" or why some people might think it's funny.

**Stimulus Material: Riddles**

1. Why did the man put his TV in the oven? (Pause, then give answer.)

   Because he wanted a TV dinner.

2. How do you know clocks are shy? (Pause, then give answer.)

   They always have their hands in front of their faces.

3. What is the best day for making pancakes? (Pause, then give answer.)

   Fry day.

The words fry and day, which are printed, are then shown to the child.

---

1Oral means that some variation of this statement is made by the interviewer.
4. What has three feet and can't stand up? (Pause, then give answer.)
   A yard stick.

5. How is a weather report like a baby? (Pause, then give answer.)
   It's always being changed.

6. What has one horn and gives milk? (Pause, then give answer.)
   A milk truck.

7. What did the grape say when it got stepped on? (Pause, then give answer.)
   It let out a little wine.

8. What three letters do people hate to write? (Pause, then give answer.)
   I O U.

The letters I, O and U (printed on paper) are shown to the child.

   I owe you........10¢. Why do you think we hate to write these letters, I O U?

9. What kind of a dog has a fever? (Pause, then give answer.)
   A hot dog.
Part: Questions

Explanation

Purpose. The purpose of "Questions" is to get a base line for the understanding of the lexical items when placed in syntactical contexts which are unambiguous. Understanding in this context is interpreted to mean that the child does not demonstrate behaviors of confusion, that there are responses which connote understanding.

Description of Stimulus Material. In this part there are four lexical items used as both adjectives and as verbs in eight sets of sentences.

Procedure. Initially, make every effort to gain the attention of the child when the stimulus material is presented. Make the introductory remarks. Then present the first question under each lexical item for each grammatical category. (See list of stimulus materials below.) Go ahead to the next grammatical category or lexical item if the response is considered correct. If, however, the response does not receive a classification of correct, stay within the same group of questions until a correct classification is made, or all the questions have been exhausted. Do not vary the question or probe to get a correct response. No question is to be repeated.

Classification of Responses. If the child responds to the question as if it makes sense, then such a response is classified as correct. This is in contrast to asking for the question to be repeated or indicating confusion.
Example of Classification of Responses. Response to the first question:

Child:

What?

This is classified as incorrect. The child may have been confused by some aspect of the question. (Other factors such as inattentiveness or low audibility may have been the cause for the child's response. Such possibilities, however, are not explored.)

Interview Procedure Using Questions as Stimulus Material

Interviewer (oral):

Now I'm going to talk about planes, apples, kids and wood.

Stimulus Material: Questions

1. Eating

A. Adjectival Category

a. Do you like eating apples to be really cold?
b. Are the eating apples you've had very sweet?
c. Are eating apples always red?

B. Verbial Category

a. Does eating apples with a friend sound like a good idea?
b. Is eating apples a good thing to do after school?

2. Flying

A. Adjectival Category

a. Have you ever seen flying planes do stunts in the air?
b. Have you heard of flying planes having accidents in the air?
c. Do you think flying planes are beautiful?

B. Verbial Category
a. Do you like the idea of flying planes as a pilot?
b. Is flying planes exciting to you?

3. Fighting
A. Adjectival Category
a. Do you stay away from fighting kids?
b. Do teachers like to see fighting kids in the halls at school?
c. Do fighting kids get into trouble?

B. Verbial Category
a. Have you ever been caught fighting kids?
b. Does fighting kids solve problems?

4. Burning
A. Adjectival Category
a. Do you like to watch burning wood in the fireplace?
b. Does the smell of burning wood make you feel good?
c. Do freshly cut trees make good burning wood?

B. Verbial Category
a. Burning wood in a fireplace can start an accident. Is that so?
b. Is burning wood the best way to heat a house?
Part: Exploration

Explanation

Purpose. The focus of this part is the ambiguous lexical items in the stimulus materials in the first presentation of "Exploration." The purpose of this part is to obtain valid classification of responses to sentences incorporating the lexical items which are presented in a way meant to preclude built in grammatical categories.

Description of Stimulus Material. Four lexical items, flying, eating, fighting and burning, are each presented in sentence structures and with appropriate intonation providing for either an adjectival or verbal interpretation by the child.

Procedure. Present taped stimulus material and questions as they are recorded on the tape. (See transcription of taped stimulus material and questions below.) Allow enough time for child to make explanation of stimulus material and to respond to question which follows. If interviewer needs to increase the responses of a child in order to make a classification, this can be done by questions or comments addressed to the child. A single repetition of each stimulus sentence is permissible for any reason.

Classification of Response. Classification of the lexical item is very difficult. Further work on the Classification procedure is indicated.

Example of Classification of Response. Response to the first sentence:

Child:
They sure can be. I believe that.

Interviewer:

What do you believe?

Child:

Planes are dangerous to fly in.

Flying is classified as a verb. This classification is based on the child's use of fly as a verb in the response to the stimulus material.

Interview Procedure Using Ambiguous Sentences as Stimulus Materials

Interviewer (taped):

I'm going to say some sentences and I'd like for you to explain the possible meaning or meanings of each sentence. Remember how you explained the riddles? This time just explain the sentences I say.

Stimulus Material: Exploration

1. Flying planes\(^1\) can be dangerous.
   Do you have anything further to add to make the meaning or meanings for this sentence as clear as possible?

2. Eating apples can be delightful.
   Is there anything further you can add to make the meaning or meanings for this sentence as clear as possible?

3. Fighting kids can be dangerous.

---

\(^1\)When sentence fragments are underlined it is to indicate that an attempt was made to present the stimuli with equal stress. When only the lexical items ringing and rolling are underlined it is to provide for greater ease in reading and understanding of Interview-Ambiguity.
Have you said enough to make the meaning or meanings for this sentence as clear as possible?

4. Burning wood can be dangerous.
Do you need to say anything else to make the meaning or meanings for this sentence as clear as possible?

Part: Expansion

Explanation

Purpose. The purpose of "Expansion" is to provide for corroborative and reliability checks. The corroborative check is in the grammatical classifications of certain lexical items in "Expansion" as compared to the classifications of responses in "Exploration," Y₁. The lexical items in the stimulus materials and the techniques of presentation are dissimilar for the two parts. The reliability check is in the presentation of two sets of stimulus materials.

Description of Stimulus Material. There are two portions of two sentences with an ambiguous lexical item in each.

Procedure. Present the first taped instructions. Allow time for the child to respond to the instructions. Continue giving the instructions in the sequence appropriate to trying to obtain responses which can be given grammatical classifications of both adjective and verb for each lexical item. Certain responses must be questioned and commented upon to provide data which can be classified. Because of the complexity of this part, training is required to enable the interviewer to select the appropriate sequential instructions. Only
a brief example of this part will be presented in combination with a classification of response. This will be followed by only a portion of the options for the remaining portion of the part.

Classification of Responses. If the lexical item appears to be descriptive of the noun that follows, then it is classified as an adjective. The lexical item is classified as a verb if an action upon the noun is indicated.

Example of Classification of Response. Possible responses made to the initial stimulus material:

Child:

Sound pretty.

Interviewer:

What sounds pretty?

Child:

Ringing bells.

Interviewer:

Could you put all of that together? What did you say about the bells?

Child:

Ringing bells sound pretty.

Ringing is classified as an adjective because ringing describes the bells.

Interview Procedure Using Sentence Fragment as Stimulus Materials

a.  Interviewer (taped):

This time I'm going to say only two words. I want you to
use these two words and make up a sentence which will make the meaning as clear as possible. The words are: ringing bells. You can use these two words in two sentences if it is necessary for showing the possible meanings.

Some Possible Responses and Sequential Steps

1. If the child does not initially produce either the verbal or adjectival lexical item in a sentence according to the classification of the interviewer, then provide step "b" for the child.

2. If the child's initial use of the lexical item ringing is classified as an adjective then present "c" next.

b. Taped Instructions:

Listen to this sentence. **Ringing bells** are beautiful sounds.

Does **ringing** tell something about the bells?

Possible Responses and Sequential Steps

1. and 2. If the child agrees or if there is no response, present "c" as the next step.

c. Oral Instructions:

Yes, **ringing** does describe the bells. Now will you make up a different kind of sentence which tells something about what is being done to the bells?
Part: Exploration

Explanation

Purpose. The purpose of this part is purely repetition. It is to determine the consistency between the classifications of the two presentations of "Exploration."

Refer back to "Exploration" for the background and other information needed on this part.

Part: Sentence Completion

Explanation

Purpose. The purpose of this part is to obtain the data on grammatical classifications of certain lexical items for comparison with classifications of particular lexical items in "Exploration," Y1. The reliability check will be satisfied by a comparison of the classifications of the two kinds of responses, the spontaneous and those obtained after some questioning.

Description of Stimulus Material. The stimulus materials are sentences which include certain lexical items and are complete except for the "to be" verbs, is or are.

Procedure. First give examples of the use of the verbs is and are. Encourage the child to interact concerning the grammaticality of these words. Then give the taped sentences in which both is and are have been deleted. Question (orally) the child after each stimulus sentence to allow for a change or an addition to the initial response.
Classification of Response. The lexical item is classified as a verb if the child has supplied the word *is* to complete the sentence. When *are* is supplied the lexical item is an adjective.

Example of Classification of Response. Response to the first stimulus material:

_Hitting_ boys *is* mean.

Interviewer:

You think it's *is* not *are*?

Child:

Yes, of course it's *is*.

Interviewer:

Now, could you use *is* and also *are*?

Child:

No sir, just *is*.

_Hitting_ is classified as a verb. The classification is based on the use of *is*.

Interview Procedure Using Incomplete Sentences as Stimulus Materials

Interviewer (oral):

Sometimes we use the word *are* or sometimes *is*.

Do we say, Those *is* your shoes?

(Allow time for child to respond.)

We *is* sitting on chairs on the floor. Is that right?

(Allow time for child's response.)

This time I want you to fill in the right word or words, *are* and *is*.
It may be possible to use both. You decide what it should be.

(Each sentence may be repeated once if needed.)

Interviewer (taped):

1. Hitting boys ____ mean.
2. Flying planes ____ dangerous.
3. Walking dogs ____ healthy.

Oral Instructions:

After each sentence is presented and the child makes a response, the interviewer asks if the alternate "to be" verb can be used. This is then followed up by some variation of the third question.

1. You can't use is/are?
2. You think it's is/are instead of is/are?
3. It's not both is and are?
APPENDIX II-D

INTERVIEW-AMBIGUITY

Name: ________________________________

Riddles: 1 2 3 4 5 6 7 8 9

Questions:

A. Adjectival Form: 1. Eating _____ 2. Flying _____
   a b c     a b c
B. Verbial Form:    a b     a b

A. Adjectival Form: 3. Fighting _____ 4. Burning _____
   a b c     a b c
B. Verbial Form:    a b     a b

Exploration:

1. Flying 1st run 2nd run 2. Eating 1st run 2nd run
   _____ _____   _____ _____

Treatment:

1. Ringing bells 1st attempt 2nd attempt
   __________ __________
2. Rolling balls __________ __________

Repeat Exploration (see above): (no. on tape_______ page_______)

Sentence Completion: (no. on tape_______ page_______)

1. Hitting boys 1st attempt 2nd attempt
   __________ __________
2. Flying planes __________ __________
3. Walking dogs __________ __________
APPENDIX II-E

RATIONALE FOR POPULATION SELECTION IN REGARD TO RACE

The following reasons are the basis for the decision to define a homogeneous White\(^1\) population for my research on language acquisition:

1. The data are to be collected by the White investigator. Criticisms can be made of data collection on Black subjects by a White investigator.

2. The research is an investigation of standard English. If Blacks are included in this study, criticisms can be made of the results regarding variations of the Blacks with the others in regard to linguistic differences.

3. The inclusion of Blacks would require an analysis by race because of accepted practice in the field. This was not the issue of this study.

The narrowness of the racial characteristics of the population for this study was considered and discussed thoroughly prior to the actual decision. I and my committee were concerned that although potential criticisms might not be legitimate should I include Blacks, that the important thing was to select a sample that would not provide a basis for unfounded criticisms.

APPENDIX II-F

FIRST QUESTIONNAIRE PRESENTED
TO SOME PARENTS

TO:
FROM: Margaret M. Mehta (Doctoral Candidate)

SUBJECT: (1) To obtain the consent of parent(s) for an interview with their child;

(2) To obtain certain population description information for the research project.

PARENTAL CONSENT:
(Agreement indicated by signature)

I am doing research on language acquisition and will be interviewing children around six and a half to almost eight years of age. I have decided on certain characteristics which I would like the children's families to have. These characteristics have been selected for several reasons and include the following: to allow for simplicity in selecting a source of children and in interviewing the children and to rule out dialect differences. I will therefore appreciate it if you will consent to the interview and provide the information requested.

1. State location of birth of parent(s) living with child since birth:

2. Indicate states and length of residence for family since child's birth:
3. (a) Parents living with child are White.
   (b) The single parent living with child is White.

4. (a) Parents living with the child have had at least three years of college education.
   (b) The single parent living with the child has had at least three years of college education.

5. A summary of the research can be made available to you if you indicate your interest.

   Thank you.

   Margaret M. Mehta
APPENDIX II-G

FIRST QUESTIONNAIRE PRESENTED
TO SOME PARENTS

TO:

FROM: Margaret M. Mehta (Doctoral Candidate in the School of Education, University of Massachusetts)

SUBJECT: (1) Briefly describe a research project being carried out at Mark's Meadow.

(2) Request the consent of parent(s) for their child to participate in the research.

(3) Obtain information on the child's family if the parent(s) agree to their child's participation in the research.

1. Arrangements have been made for me to carry out a research project on language development at Mark's Meadow. The research involves interviews with children who range in age from approximately six and a half to seven and a half years of age. The interview usually requires one individual session which is approximately forty-five minutes to one hour and is done during the school day. It is scheduled at a time that is not in conflict with the day's important activities. The interview is presented orally and is composed of material which many children have responded to as if it were games and play activities.

The purpose of the research is to develop ways in which language data can be collected and to find out more about what children at this age know about certain aspects of language. This research
focuses on particular aspects of the way in which children string words together and use certain vocabulary.

You may have questions on this study. I can be reached at home and would be glad to discuss it with you (549-1112).

2. On the basis of the description of the research to be carried out by Margaret Mehta, I give my permission for my child to be interviewed.

3. If you have agreed to an interview, I would appreciate obtaining the following information regarding your child.
   a. State location of birth of parent(s) who have been living with child since his/her birth:
   b. Indicate states and length of residence (in relation to child's age) for family since child's birth:
   c. Indicate degrees and/or number of years of education of parent(s) living with child:
   d. A summary of the research can be made available to you YES NO if you indicate your interest.

Thank you for taking the time to consider this request. Please return the second page in the enclosed envelope.

Thank you.

Margaret M. Mehta
APPENDIX II-H

SECOND QUESTIONNAIRE PRESENTED TO SOME PARENTS*

Dear

Last Spring I conducted a study on language at Marks Meadow. You allowed me to interview your child for this research. To complete this study I would like to get some additional information from you. I would appreciate it if you would answer the following questions and return them to me in the enclosed envelope. (This information will remain confidential.)

Thank you for your cooperation.

Margaret M. Mehta

The following questions are to be completed by the parent(s) living with the child. (If both parents are presently living with the child, they are requested to answer the questions.)

Was high school completed by:

Father
Mother

How many year(s) of education or and degree(s) have been obtained upon the completion of high school?

Father
Mother

*Sent when data was not adequate from first questionnaire.
APPENDIX III - A

LINGUISTIC DATA FOR EACH SUBJECT

The tables which follow provide the linguistic data for all of the parts of Interview-Ambiguity for all subjects for whom the part was completed. The general framework for meaningful analyses of these data reside in the variables age, socialization by sex and parental education, and such analyses are to be found in Section B of Chapter III.

The types of classifications for "Riddles" and "Questions" in Tables 3.22 and 3.23 which follow include correct (✓) and incorrect (x). Tables 3.24, 3.25, and 3.26 provide data for subjects on Interview-Ambiguity parts "Exploration," "Expansion," and "Sentence Completion." When stimulus material was not given, its absence is indicated (-). The data and numbers of the subjects who were not included in Chapter III are shaded.1

---

1 The linguistic data which are used in Chapter III are for only those subjects for whom there are data for all parts.
Table 3.22. RIDDLES: CLASSIFICATION\(^1\) BY NUMBER OF ALL RIDDLES GIVEN, NUMBER AND PERCENTAGE CORRECTLY CLASSIFIED BY SUBJECT NUMBER\(^2\) AND TOTAL RIDDLES GIVEN.

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Total riddles given</th>
<th>Classification by Numbers</th>
<th>Of all riddles given, number and percentage correctly classified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>✓ x ✓ ✓ ✓ - - - - -</td>
<td>4 80</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>x x - x - x x x</td>
<td>0 0</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>x x x x ✓ x x x x x x x</td>
<td>1 11</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>x x x x x x - x x x x x</td>
<td>0 0</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>✓ x x - x - x x x x x x</td>
<td>1 14</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>x x - x x x - x x x -</td>
<td>0 0</td>
</tr>
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<td>2</td>
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<td>2 100</td>
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<td>4</td>
<td>x x ✓ ✓ ✓ - - - - -</td>
<td>2 50</td>
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<tr>
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<td>4</td>
<td>- x ✓ ✓ ✓ - - - - -</td>
<td>3 75</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>x x x x x x x - - - -</td>
<td>0 0</td>
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<tr>
<td>11</td>
<td>9</td>
<td>x x ✓ ✓ x x x x x x x x</td>
<td>1 11</td>
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<td>x ✓ ✓ ✓ - ✓ - - - -</td>
<td>3 75</td>
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<td>✓ x x - ✓ x - - - -</td>
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<td>14</td>
<td>9</td>
<td>x x ✓ ✓ x x x ✓ x x x</td>
<td>2 22</td>
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<tr>
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<td>5</td>
<td>- ✓ x ✓ ✓ ✓ - - - - -</td>
<td>3 60</td>
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<tr>
<td>16</td>
<td>4</td>
<td>x x x - x - - - - -</td>
<td>0 0</td>
</tr>
</tbody>
</table>

\(^1\)Classification refers to correct or incorrect riddles as judged by procedures in Step 3.3 of Draft II of "Mehta Methodology to Collect Valid Linguistic Data."

\(^2\)Subject number is by alphabetical order of surname of subject.
Table 3.23. QUESTIONS: CLASSIFICATION\(^1\) BY SYMBOL, OF ALL QUESTIONS GIVEN, NUMBER AND PERCENTAGE CORRECTLY CLASSIFIED BY SUBJECT NUMBER\(^2\) AND TOTAL QUESTIONS GIVEN

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Total questions given</th>
<th>Classification by symbols</th>
<th>Of all questions given, number and percentage correctly classified</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
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<tr>
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<td>8</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<td>8</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>14</td>
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<td>✓</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

\(^1\)Classification refers to correct or incorrect questions as judged by procedures in Step 3.3 of Draft II of "Mehta Methodology to Collect Valid Linguistic Data."

\(^2\)Subject number is by alphabetical order of surname of subject.
Table 3.24. EXPLORATION: GRAMMATICAL CLASSIFICATIONS BY SEQUENCE OF PRESENTATION FOR STIMULUS MATERIALS 1-3 BY SUBJECT NUMBER

<table>
<thead>
<tr>
<th>Subject number</th>
<th>Grammatical classifications by sequence of presentation for stimulus materials 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st presentation</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>verb</td>
</tr>
<tr>
<td>3</td>
<td>verb</td>
</tr>
<tr>
<td>5</td>
<td>adj.</td>
</tr>
<tr>
<td>7</td>
<td>amb.</td>
</tr>
<tr>
<td>8</td>
<td>adj.</td>
</tr>
<tr>
<td>9</td>
<td>verb</td>
</tr>
<tr>
<td>10</td>
<td>none</td>
</tr>
<tr>
<td>11</td>
<td>verb</td>
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<tr>
<td>12</td>
<td>verb</td>
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<td>13</td>
<td>verb</td>
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<td>14</td>
<td>verb</td>
</tr>
<tr>
<td>15</td>
<td>verb</td>
</tr>
<tr>
<td>16</td>
<td>adj.</td>
</tr>
</tbody>
</table>

*Inaudible
Table 3.25. EXPANSION: GRAMMATICAL CLASSIFICATIONS BY SEQUENCE OF PRESENTATION FOR STIMULUS MATERIALS 1 AND 2 BY SUBJECT NUMBER

<table>
<thead>
<tr>
<th>Subject Number</th>
<th>2nd presentation</th>
<th>3rd presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>adj.</td>
<td>verb</td>
</tr>
<tr>
<td>2</td>
<td>adj.</td>
<td>adj.</td>
</tr>
<tr>
<td>3</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>4</td>
<td>verb</td>
<td>none</td>
</tr>
<tr>
<td>5</td>
<td>none</td>
<td>verb</td>
</tr>
<tr>
<td>6</td>
<td>adj.</td>
<td>both/amb.</td>
</tr>
<tr>
<td>7</td>
<td>adj.</td>
<td>adj.</td>
</tr>
<tr>
<td>8</td>
<td>none</td>
<td>verb</td>
</tr>
<tr>
<td>9</td>
<td>adj.</td>
<td>verb</td>
</tr>
<tr>
<td>10</td>
<td>none</td>
<td>verb</td>
</tr>
<tr>
<td>11</td>
<td>adj.</td>
<td>none</td>
</tr>
<tr>
<td>12</td>
<td>both/amb.</td>
<td>none</td>
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<tr>
<td>13</td>
<td>verb</td>
<td>none</td>
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<tr>
<td>14</td>
<td>adj.</td>
<td>none</td>
</tr>
<tr>
<td>15</td>
<td>adj.</td>
<td>none</td>
</tr>
<tr>
<td>16</td>
<td>none</td>
<td>adj.</td>
</tr>
</tbody>
</table>

Grammatical classification by sequence of presentation for stimulus materials 1 and 2.
Table 3.26  SENTENCE COMPLETION: GRAMMATICAL CLASSIFICATIONS BY SEQUENCE OF PRESENTATION FOR STIMULUS MATERIAL 1-3 BY SUBJECT NUMBER

<table>
<thead>
<tr>
<th>Subject Number</th>
<th>Grammatical classifications by sequence of presentation for stimulus materials 1-3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5th Presentation</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>adj.</td>
</tr>
<tr>
<td>3</td>
<td>adj.</td>
</tr>
<tr>
<td>5</td>
<td>adj.</td>
</tr>
<tr>
<td>7</td>
<td>verb</td>
</tr>
<tr>
<td>8</td>
<td>verb</td>
</tr>
<tr>
<td>9</td>
<td>verb</td>
</tr>
<tr>
<td>10</td>
<td>none</td>
</tr>
<tr>
<td>11</td>
<td>adj.</td>
</tr>
<tr>
<td>12</td>
<td>verb</td>
</tr>
<tr>
<td>13</td>
<td>verb</td>
</tr>
<tr>
<td>15</td>
<td>verb</td>
</tr>
<tr>
<td>16</td>
<td>adj.</td>
</tr>
</tbody>
</table>
If the extra copy of Appendix III-B is not in the back binding, another copy of it can be made for more convenient reading of Tables 3.6-3.19.

The type of grammatical classification based on specified procedure is either inconsistent or consistent. This refers to the same-ness or lack of it within a part. If the classifications are identical then they are reported as 1st/4th, or 2nd/3rd or 5th/6th for "Exploration", "Expansion" and "Sentence Completion" respectively. If they are different, then the data are presented separately for each presentation.

The order in which the stimulus materials were presented in the Interview was: (Introduction) Riddles and Questions; (1st) Exploration; (2nd, 3rd) Expansion; (4th) Exploration; (5th, 6th) Sentence Completion.

The classification procedure for grammatical categories varied by parts and is described in Draft II of "Mehta Methodology to Collect Valid Linguistic Data," Step 3.3.

Information on the age, sex and parental education variables can be found in Section A of Chapter III.

Stimulus material is listed by parts in Interview-Ambiguity in Appendix II-C.

Classifications Categories: Adjectival, Verbial, Ambivalent, None and Both. The classification procedures for the adjectival and verbal categories differed by part as indicated in 3.3 of the application of Draft II. For the parts in which the ambivalent classification was applied, the data could not be interpreted. The category of "none" was used when there was no response or if it was inaudible. Finally, "both" was used in "Sentence Completion" when the utterances were not ambivalent and were both adjectival and verbal. The adjectival and verbal classifications are the ones which are analyzed and interpreted. Data for the ambivalent and none categories are provided to enable the reader to observe the complete array of classifications by category.

Shaded data in Tables 3.8-3.16 indicates that the data are classified but not analyzed.
APPENDIX IV-A

CHARACTERIZATION OF STAGES OF LANGUAGE ACQUISITION

Table 4.1. "Stages of Acquisition of Promise/Tell"

Children's Interpretations of Test Constructions with promise and tell. The chart shows the children's assignment of subject to complement verb following promise/tell in 8 constructions of the type

Donald Duck promises/tells Bozo to do a somersault.

\[
\begin{align*}
&\text{NP}_1 \quad \text{pr/tell} \quad \text{NP}_2 \quad \text{to inf vb} \\
&\text{...}
\end{align*}
\]

Incorrect interpretations (stages 1, 2, 3) assign wrong subjects as indicated. Correct interpretation assigns NP$_2$ following tell, NP$_1$ following promise.

"Characterization of Stages" | "Incorrect Interpretations"
--- | ---
"Rote Memorization" | Stage 1. 10 children
tell - all correct
promise - all wrong
Assigned NP$_2$ as subject throughout.
Boys: 5.0, 5.1, 5.3', 6.10, 7.6
Girls: 6.5, 6.6, 7.1, 8.7, 8.10

"Over-Generalization" | Stage 2. 4 children
tell - mixed
promise - mixed
Assigned both NP$_1$ and NP$_2$ as subject following both words.
Boys: 6.9
Girls: 5.1', 5.3, 6.9'

"Transitional Re-Analysis" | Stage 3. 5 children
tell - all correct
promise - mixed
Assigned NP$_2$ as subject consistently following tell and both NP$_1$ and NP$_2$ following promise.
Boys: 8.2, 9.2, 9.7'
Girls: 6.5', 8.8'

1 This table has been adapted from Table 4.2 in Carol Chomsky, The Acquisition of Syntax in Children from 5 to 10 (M.I.T. Press, 1969), 37. Material added to this table is in quotation marks.
"Reanalysis"

"Correct Interpretations"

Stage 4. 21 children

tell - all correct
promise - all correct
Assigned NP₂ as subject following tell, and NP₁ following promise.

Boys: 5.2, 5.2', 5.3", 5.10, 6.7, 7.3, 7.9, 8.4, 8.5, 8.8, 9.7", 9.8, 9.9
Girls: 7.0, 7.0', 7.2, 8.6, 9.1, 9.7, 9.8', 10.0
REFERENCES


Addendum


APPENDIX III-B

FOOTNOTES FOR TABLES 3.6-3.19

If the extra copy of Appendix III-B is not in the back binding, another copy of it can be made for more convenient reading of Tables 3.6-3.19.

1 The type of grammatical classification based on specified procedure is either inconsistent or consistent. This refers to the sameness or lack of it within a part. If the classifications are identical then they are reported as 1st/4th, or 2nd/3rd or 5th/6th for "Exploration", "Expansion" and "Sentence Completion" respectively. If they are different, then the data are presented separately for each presentation.

2 The order in which the stimulus materials were presented in the Interview was: (Introduction) Riddles and Questions; (1st) Exploration; (2nd, 3rd) Expansion; (4th) Exploration; (5th, 6th) Sentence Completion.

3 The classification procedure for grammatical categories varied by parts and is described in Draft II of "Mehta Methodology to Collect Valid Linguistic Data," Step 3.3.

4 Information on the age, sex and parental education variables can be found in Section A of Chapter III.

5 Stimulus material is listed by parts in Interview-Ambiguity in Appendix II-C.

6 Classifications Categories: Adjectival, Verbial, Ambivalent, None and Both. The classification procedures for the adjectival and verbal categories differed by part as indicated in 3.3 of the application of Draft II. For the parts in which the ambivalent classification was applied, the data could not be interpreted. The category of "none" was used when there was no response or if it was inaudible. Finally, "both" was used in "Sentence Completion" when the utterances were not ambivalent and were both adjectival and verbal. The adjectival and verbal classifications are the ones which are analyzed and interpreted. Data for the ambivalent and none categories are provided to enable the reader to observe the complete array of classifications by category.

Shaded data in Tables 3.8 3.16 indicates that the data are classified but not analyzed.