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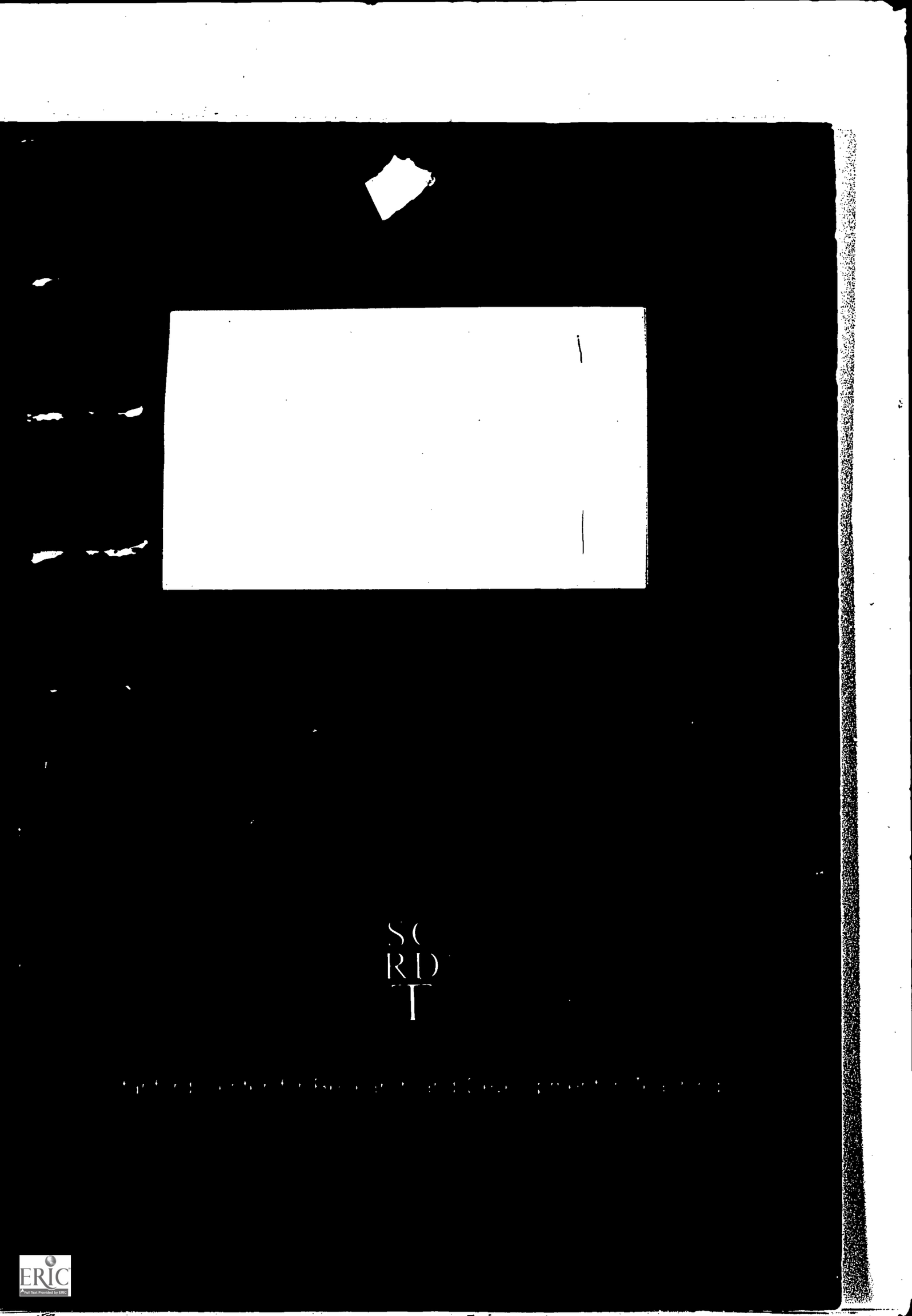
ABSTRACT

This study developed and evaluated a manual for the improvement of teachers' effectiveness in explaining. A class of 60 beginning teacher trainees was randomly divided into two groups. All subjects were given a pretest that required them to make three oral explanations in response to three questions asked by an experimenter; the questions and answers were tape-recorded. Following the pretest, half of the class received the "How To Explain" manual as the basis for training; the other half did not. After training, all subjects were given a posttest consisting of three new questions. Randomly ordered answers for each subject were played to 10 raters, who were seventh- and eighth-grade students. The students rated each answer on four dimensions: a) organization, b) clarity, c) quality, and d) rank among the six answers for that subject. Subsequently, six experimental and six control subjects were randomly selected, their posttest answers only were transcribed, and these answers were rated and coded by trained judges on six dimensions a) content validity, b) logical organization, c) verbal emphasis, d) rule-example-rule, e) lesson divisions, and f) vagueness--in an attempt to determine whether the explanations of the experimental group reflect the emphasis on these six dimensions in the "How To Explain" manual. Results indicate that the manual and the total program in which it was used had significant effects in the experimental group's explanations. A 35-item bibliography and appendixes are included. (Author/MJM)



STANFORD CENTER
FOR RESEARCH AND DEVELOPMENT
IN TEACHING

Technical Report No. 26

DEVELOPMENT AND EVALUATION OF A MANUAL FOR IMPROVING TEACHERS' EXPLANATIONS

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This Technical Report reproduces a dissertation bearing the same title, submitted to Stanford University, 1971. Copyright for this dissertation had been claimed in the name of Robert J. Miltz, but has been abandoned.

INTRODUCTORY STATEMENT

The Center is concerned with the shortcomings of teaching in American schools: the ineffectiveness of many American teachers in promoting achievement of higher cognitive objectives, in engaging their students in the tasks of school learning, and, especially, in serving the needs of students from low-income areas. Of equal concern is the inadequacy of American schools as environments fostering the teachers' own motivations, skills, and professionalism.

The Center employs the resources of the behavioral sciences--theoretical and methodological--in seeking and applying knowledge basic to the achievement of its objectives. Analysis of the Center's problem area has resulted in three programs: Teaching Effectiveness, Teaching Students from Low-Income Areas, and the Environment for Teaching. Drawing primarily upon psychology and sociology, and also upon economics, political science, and anthropology, the Center has formulated integrated programs of research, development, demonstration, and dissemination in these three areas. In the program on Teaching Effectiveness, the strategy is to develop a Model Teacher Training System integrating components that dependably enhance teaching skill. In the program on Teaching Students from Low-Income Areas, the strategy is to develop materials and procedures for engaging and motivating such students and their teachers. In the program on the Environment for Teaching, the strategy is to develop patterns of school organization and teacher evaluation that will help teachers function more professionally, at higher levels of morale and commitment.

The present Technical Report was prepared as part of the Center's program on Teaching Effectiveness. The manual, "How to Explain," may form a part of the program's Model Teacher Training System, now under development. The work by Dr. Miltz may be considered to have carried that manual, presented as Appendix A, through its first field test. Further revision, testing, and development are under way.

ACKNOWLEDGMENTS

In order to complete any major work, one must have support both professionally and emotionally. Fortunately for this project, strong support has been received in both of these areas. Professionally, Dr. N. L. Gage contributed more than could ever have been expected. From the beginning to the end Dr. Gage has done much more than simply advise, he has invested a tremendous amount of time and energy into every aspect of the project. Without his support and counsel this work would not have been completed. In the emotional realm, there is no better than my wife, Vernette. Her strong support throughout the ups and downs of the project made it possible to finish with a minimum amount of stress and strain.

I would also like to thank Dr. R. Bridgham, Dr. W. Iverson, and Chandrakala Dhar, all of whom struggled with me in the development and completion of this project. A special thank you must go to Lew Knight, one of those rare friends and colleagues who always seems to be there with a helping hand when it is most needed. Finally, much credit must be given to the man who started me off on the educational track and who has constantly kept me from becoming derailed, Dr. Dwight W. Allen.

ABSTRACT

The purpose of this study was to develop and evaluate a manual for the improvement of teachers' effectiveness in explaining. The manual was designed to help the teacher understand major aspects of good explanations and to give him practice in using them. It was evaluated through an experiment in a preservice teacher training program. A class of 60 beginning teacher trainees was randomly divided into two groups. All subjects were given a pretest that required them to make three extemporaneous oral explanations in response to three questions asked by an experimenter. The questions and answers were tape recorded. After the pretest, half of the class received the "How to Explain" manual as the basis for training. The other half was not given the training manual. After training, all subjects were given a posttest consisting of three new questions.

After the collection of the pre- and posttest data, the answers to both sets of questions for each subject were transferred to another tape in a random order. These randomly ordered answers for each subject were then played to ten raters, who were 7th- and 8th-grade students. The students rated each answer on four dimensions: (a) organization, (b) clarity, (c) quality, and (d) rank among the six answers for that subject.

Subsequently, six experimental and six control subjects were randomly selected, their posttest answers only were transcribed, and these transcribed explanations were rated and also coded by trained judges on six dimensions--(a) content validity, (b) logical organization, (c) verbal emphasis, (d) rule-example-rule, (e) lesson divisions, and (f) vagueness--in an attempt to determine whether the explanations of the experimental group reflected the emphasis on these six dimensions in the "How to Explain" manual.

The Analysis of variance of the posttest ratings revealed differences between means significant at the .01 level for all four rated dimensions. The ratings on organization, clarity, and quality were highly correlated, however, indicating that the three separate ratings may properly be regarded as ratings of one general dimension. These findings indicate that the training procedure was effective in helping the experimental subjects improve their effectiveness in explaining.

Six dimensions of the content of the explanations were rated. On the content validity dimension, the experimental group was superior at the .01 level. On the logical organization dimension, the experimental group had significantly higher frequencies of referring to "things" and relationships ($p < .01$ and $p < .05$, respectively) than

the control group. On the verbal emphasis dimension, the experimental group showed significantly ($p < .01$) higher frequency than the control group. The mean for the total number of examples used was significantly ($p < .01$) higher for the experimental group. The experimental group obtained significantly ($p < .01$) higher ratings on visibility of the summary.

Both the vagueness ratio and the frequency of anaphoric references were significantly higher for the control group. Finally, the means for total numbers of words and sentences used were significantly higher for the experimental group.

The results indicate that the manual and the total program in which it was used had significant effects on the experimental group's explanations. The total treatment shows promise for helping teachers develop more effective explanations.

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CHAPTER I

THE RATIONALE OF THE MANUAL ON EXPLAINING

This study was aimed at the development and evaluation of a manual for the improvement of teacher effectiveness in explaining. The manual was designed to help the teacher understand the major aspects of good explanations and to give him practice in improving those aspects. This chapter describes the rationale of the study in terms of (a) a definition of explaining, (b) the importance of explanation in teaching, and (c) the development and design of the manual.

The Definition of Explaining

The verb "to explain" may be used in many different senses. One may be said to explain himself, a dream, or a book; explain how to do something; explain why an event occurred or a law obtains; or explain for what reason persons or groups acted as they did. In a chapter on explaining, Swift (1961) noted that,

> Many terms commonly used in educational theory and practice have been the themes of extended discussions -- 'needs,' 'interests,' and 'problems,' for example. Other terms have figured much less obtrusively in educational theory, though they occur frequently at the applied level of actual classroom instruction. One such term is 'explanation.' Theorists both offer and call for explanations, and teachers in the discourse of instruction employ the terms 'explanation' and 'explain' with considerable frequency. The terms appear in several kinds of educational context, but not always with the same meaning (p. 179).

Smith and Meux (1962) defined an "entry" in classroom discourse as an opening phase that "always contains a verbal move which evokes at least one, but more often a series of related verbal exchanges

(p. 29). Then they classified explanatory entries in classroom discourse into six types: mechanical, causal, sequential, procedural, teleological, and normative. But all such entries have one thing in common:

> They give a particular consequent and they require that an antecedent be supplied. To explain is to set forth an antecedent condition of which the particular event or process to be explained is taken as the effect, or else, to give the rules, definitions, or facts which are used to justify decisions, judgments, actions, etc. (p. 40).

In his textbook on logic, Copi (1961) characterized explaining as a

> group of statements or a story from which the thing to be explained can logically be inferred and whose assumption removes or diminishes its problematic or puzzling character.. It thus appears that explanation and inference are very closely related. They are, in fact, the same process regarded from opposite points of view. Given certain premises, any conclusion which can logically be inferred from them is regarded as being explained by them. And given a fact to be explained, we say that we have found an explanation for it when we have found a set of premises from which it can logically be inferred (p. 420).

In their studies of classfoom discourse, Bellack, et al. (1966), defined explaining as follows:

> To explain is to relate an object, event, action, or a state of affairs to some other object, event, action, or state of affairs; or to show the relation between an event or state of affairs and a principle or generalization; or to state the relationships between principles or generalizations (p. 24).

In his volume on the conduct of inquiry, Kaplan (1964) states that

> an explanation may be said to be a concatenated description. It does its work, not by invoking something beyond what might be described, but by putting one fact or law into relation with others (p. 329).

As had been briefly illustrated, many definitions of explaining behavior have been offered. Yet if one is to develop a training program it is necessary to have a general definition so that, within the general parameters, one can draw from a wide variety of divergent views to develop the training packet. Therefore, for the purposes of this study, explanations will be said to occur whenever the teacher's discourse "moves beyond the offering of information or the execution of performance to matters of meaning, relationships, causes, factors, or reasons" (Swift, 1961).

The Importance of Explaining in Teaching

Explaining by its very definition would seem to be inexorably tied to teaching. In classrooms, situations that require explanations probably occur every day. In the development of their explaining project, Gage and his associates (1968) noted that "explaining behavior can reasonably be expected to remain an essential part of the teacher's repertoire" (p. 117). In the give and take of teaching, the occasion probably arises frequently for brief one-sentence or one-paragraph explanations by the teacher. Such explanations may deal with the way in which something (a) works or fits together, (b) causes something, (c) leads to something, (d) is attained, (e) has purposes, functions or goals, and (f) is justified in terms of its definition or characteristics (Smith and Meux, 1962). Yet even though explaining is a key skill in the teacher's repertoire, there has been little research in explaining behavior and even less in the field of training teachers for improved explaining behavior.

The importance here being assigned to explaining in teaching has

been moderately well documented. One of the earliest observations that can be linked to the ability of the teacher to explain was carried out by Burstall (1909), an Englishwoman who visited American schools. She noted a great deal of recitation which she felt was not necessarily teacher-dominated and was sometimes distinguished by a great deal of pupil-pupil interaction. The importance of explaining even then may be inferred from her judgment that the ideal teacher should be able to structure the facts and ideas for the pupils and clarify the opinions expressed by them. In 1912, Stevens (cited in Hoetker and Ahlbrand, 1969) reported on four years of observation in secondary school classrooms. Again the importance of explaining may be inferred from her finding that teachers talked 64 per cent of the time, no matter what the subject or grade level, and about 80 per cent of this teacher talk was devoted to asking, answering, or clarifying questions.

Many subsequent studies concentrated on the questioning aspect of teaching rather than the explaining aspect. But Hart (1934) surveyed the opinions of over 3700 high school students and found a total of 43 reasons for liking and 30 reasons for disliking a teacher. He found that students' "foremost reasons - foremost by more than 500 frequencies - is the very essence of good teaching, namely, helpfulness with school work, clear explanations of lessons and assignments, and the use of examples in teaching" (p. 133). As for the teachers least liked, Hart found that the students second most frequent complaint was that the disliked teacher was "not helpful with school work, does not explain lessons and assignments, does not make her work clear, and does not have her work planned" (p. 252).

In their study of logic of classroom discourse, Smith and Meux (1962) as already indicated, identified six types of explaining and found that explaining was the third most frequent logical category, occurring in 12.9% of the entries and trailing only describing and designating, which occurred in 25.3% and 14.8% of the entries, respectively. In studies of classroom discourse, Bellack and his associates (1968) found that the largest proportion, "approximately 50 to 60 per cent," of lines spoken by teachers were "statements either of fact or explanations" (p. 326).

Further evidence of the importance assigned to explaining was obtained by Hyman (1968), who asked several groups of students and a group of professors to sort 75 statements concerning the ideal teacher-pupil relationship. Among the statements rated highest in importance in all groups was: "The teacher's explanations fit in correctly with the student's ability and knowledge." The importance attached to explaining by students and professors was impressive.

Many rating scales, designed for evaluation of teacher competence, illustrate the importance of explaining behavior. The Stanford Teacher Competence Appraisal Guide (Stanford Teacher Education Program, 1968) has a scale for "Clarity of Presentation," i.e., the degree to which "the content of the lesson is presented so that it is understandable to the pupils." A scale for use by supervisors in rating teachers (Douglas, 1967) emphasized the need to "explain assignments clearly" and "the ability to explain orally."

If explaining behavior is important for teaching, then it is important that training methods be developed to prepare teachers to

effectively carry out the explaining function. The development of a training program to improve explaining behavior of teachers is the central focus of this study.

Development of the Training Manual

The question of the type of training device to develop is crucial. The alternatives were many, e.g., an audio tape program, a videotape program, a lecture, a manual, a book, etc. A great deal of time was spent exploring the efficacy of various alternatives. After considerable thought and discussion it was decided that the manual format would be the most effective for this project. It was felt that a manual has the potential of being disseminated easily and, if bound in an attractive and appealing layout, would have a high potential of being read.

In the development of the training manual, the author drew upon a variety of sources: (a) studies of explaining by N. L. Gage and his associates at the Stanford Center for Research and Development in Teaching, (b) pilot work by Bryce Hudgins and his students at Washington University in St. Louis, (c) training procedures developed by the Far West Regional Laboratory for Educational Research in Berkeley, and (d) readability research by Funkhouser (1967). The purpose of the training manual was to provide a model for the act of explanation and practice aimed at using that model to improve effectiveness in explaining. The evaluation of the manual assessed its effect on the participants' explaining behavior. (A copy of the "How to Explain" manual appears in Appendix A.)

To determine the basic concepts to be included in the training

manual, it was necessary to isolate from the large number of possibilities those that were apparently most useful and important. Many approaches to the improvement of explaining behavior can be inferred from the research and writing of Copi (1961), Smith and Meux (1962), Thyne (1963), Funkhouser (1967), Gage, et al. (1968), Hiller, Fisher, Kaess (1968), and Rosenshine (1969). Some of the dimensions of behavior to which these writers referred are (a) speed of delivery, (b) vagueness, (c) precision of statement, (d) frequency of examples, (e) amount of material covered, (f) length, (g) rule-example-rule, and (h) length of sentences.

In an attempt to obtain part of the basis for selecting among these dimensions, the author obtained ratings of 40 such items from 22 experienced teachers. The Explanation Rating Sheet used for this purpose is presented in Figure 1. The teachers were asked to rate the items on two dimensions. The first dimension was value; i.e., does the item appear useful, helpful, or valid as an aid in improving explaining ability? The second dimension was learnability; i.e., can the item be learned quickly and easily? It was explained to each rater that in normal classroom situations the occasion frequently arises for brief explanations by the teacher. Each rater was asked to draw upon his knowledge of the classroom in order to rate each item on value and learnability. Table I summarizes the results of these ratings. The numbers in Table I correspond to the item numbers on the Explanation Rating Sheet in Figure 1. Although these ratings were not regarded as necessarily valid, they provided some basis for the selection of items of behavior to be stressed in a brief manual. Accordingly, these items

EXPLANATION RATING SHEET

In classrooms the situations that require explanations occur every day. The occasion frequently arises for brief one-sentence or one-paragraph explanations by a teacher. The items that follow relate to the act of explaining, you are asked to rate them on two dimensions. Please follow directions carefully.

A. In column #1, rate each item as to its VALUE, i.e., how useful, helpful, or valid does the item appear in regard to good explanations. Rate each item on a "a," "b," "c," "d," "e" scale with:

a - Extremely valuable
b - Very valuable
c - Somewhat valuable
d - Not very valuable
e - Not at all valuable

Place the appropriate letter in the parenthesis under column #1.

EXAMPLE:	Column 1	Column 2
Introduction	(d)	( )

This means you feel an introduction is not very valuable in an explanation.

B. In Column #2, rate each item as to its LEARNABILITY, i.e., do you feel the item could be taught quickly and easily. Use the same method as Column #1 only with:

a - Extremely learnable
b - Very learnable
c - Somewhat learnable
d - Not very learnable
e - Not at all learnable

Now rate each item on "Value" in Column #1 and on "Learnability" in Column #2.

	Column #1	Column #2
1. Speed of delivery	( )	( )
2. Logical organization	( )	( )
3. Examples	( )	( )
4. Easy words	( )	( )
5. Clarity	( )	( )
6. Short sentences	( )	( )
7. Set the stage for the explanation	( )	( )

Figure 1. Explanation Rating Sheet (continued on next page)

Explanation Rating Sheet (continued)

	Column #1	Column #2
8. Analogies	( )	( )
9. Relevance to students	( )	( )
10. Repetition	( )	( )
11. Use of diagrams and illustrations	( )	( )
12. Precise statements	( )	( )
13. Simplicity	( )	( )
14. Metaphors	( )	( )
15. Validity	( )	( )
16. Use variety of materials	( )	( )
17. Incorporate human interest	( )	( )
18. Highly structured	( )	( )
19. Loosely structured	( )	( )
20. Brevity	( )	( )
21. Flexible	( )	( )
22. Selection of appropriate content	( )	( )
23. Summarize	( )	( )
24. Eliminate digression and irrelevancy in explanation	( )	( )
25. Style	( )	( )
26. Activity words (use words that suggest activity)	( )	( )
27. Practicality	( )	( )
28. Interest	( )	( )
29. Verbal fluency on part of explainer	( )	( )
30. Explaining links (words that link phrases or sentences so that they elaborate or expand the phrase or sentences)	( )	( )
31. Material not too difficult	( )	( )
32. Focus attention on important points	( )	( )
33. Elaborate	( )	( )
34. Amount of material covered	( )	( )
35. Elicit responses from students	( )	( )
36. Length of explanation	( )	( )

Figure 1. Explanation Rating Sheet (continued on next page)

Explanation Rating Sheet (continued)

	Column #1	Column #2
37. Selection of appropriate content	( )	( )
38. Avoid vague words	( )	( )
39. Rule-Example-Rule (present main statement, follow with details, conclude with main statement)	( )	( )
40. Show positive emotion	( )	( )

Figure 1. Explanation Rating Sheet.

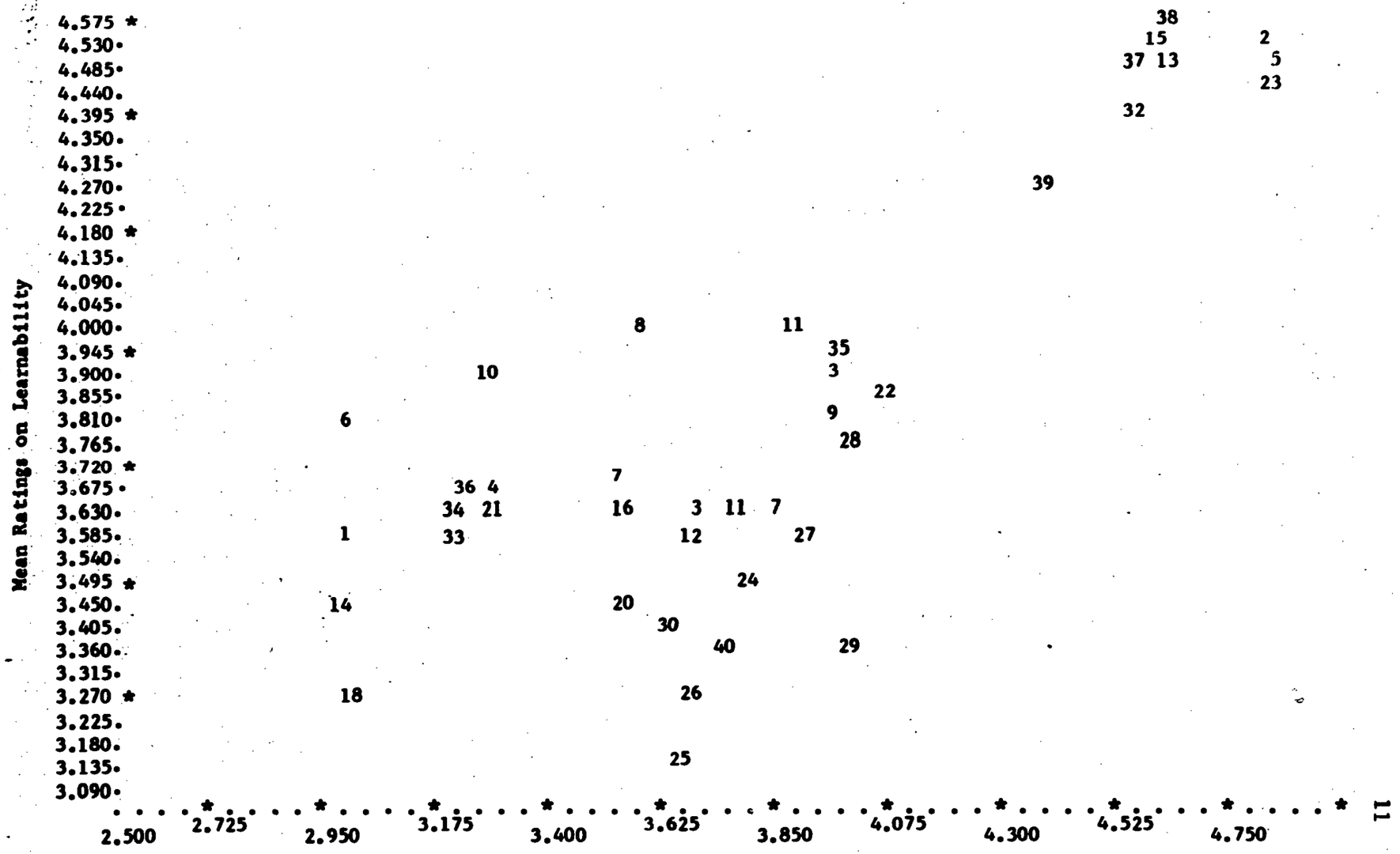
were used as key concepts in developing the training manual. The items that received the highest mean ratings on both value and learnability were logical organization (Item 2), clarity (Item 5), simplicity (Item 13), validity (Item 15), summary (Item 23), focus attention on important points (Item 32), selection of appropriate content (Item 37), avoid vague words (Item 38), and rule-example-rule (Item 39).

To develop an interesting, comprehensible, and effective training manual, it seemed desirable to draw upon research in readability. Such research is directed toward determining the variables in prose which are correlated with ease of reading comprehension. It deals with correlates of difficulties experienced by adults and children in understanding what they read, not because the concepts are too difficult, but simply because of the way in which these concepts are presented.

A very recent and comprehensive study of the problems of communicating written science material to non-scientists was made by Funkhouser (1967). The fact that Funkhouser focused on written communication made his results of particular value in the development of the training manual. He used four major measures of readability: the Flesch "reading ease" formula; the Farr-Jenkins-Patterson "short"form

TABLE I

SCATTERPLOT OF MEAN RATINGS OF DIMENSIONS OF EXPLAINING BEHAVIOR AS TO "VALUE" AND "LEARNABILITY"
(Mean of 22 raters on five-point scale (High=5, Low= 1)



of the Flesch formula; the Dale-Chall formula; and Taylor's "cloze" procedure. Some of the correlates he found were (a) sentence length, (b) frequency of images of activity ("activity words" are words or phrases which suggest visual images of activity, for example, "whizzing" or "busy factory"), (c) relevance to reader, attitude scale correlated to per cent of activity words and cloze readability score, (d) focus on body of material to be learned, per cent of multi-content lines, (e) length, total number of words, and (f) precision of statement, instances of misinformation. Funkhouser's findings were used as bases for both the substance and style of the training manual.

Design of the Training Manual

The manual itself was divided into two main sections which dealt with the nine dimensions identified on the basis of the ratings of value and learnability by experienced teachers. The first section, consisting of the first two lessons, focused on the logical organization and selection of content. The second section, consisting of the last three lessons, focused on application or the actual giving of the explanation. Figure 2 outlines the model for the development of the training manual. (Appendix A contains a copy of the "How to Explain" training manual.)

The first section of the manual, on the logical organization of an explanation and the selection of content, focuses on developing the basic structure of an explanation. This section concentrates on four aspects of the development of an explanation, (1) listening, (2) determining "things," (3) determining relationships, and (4) determining general principle. The first aspect, that of listening, is

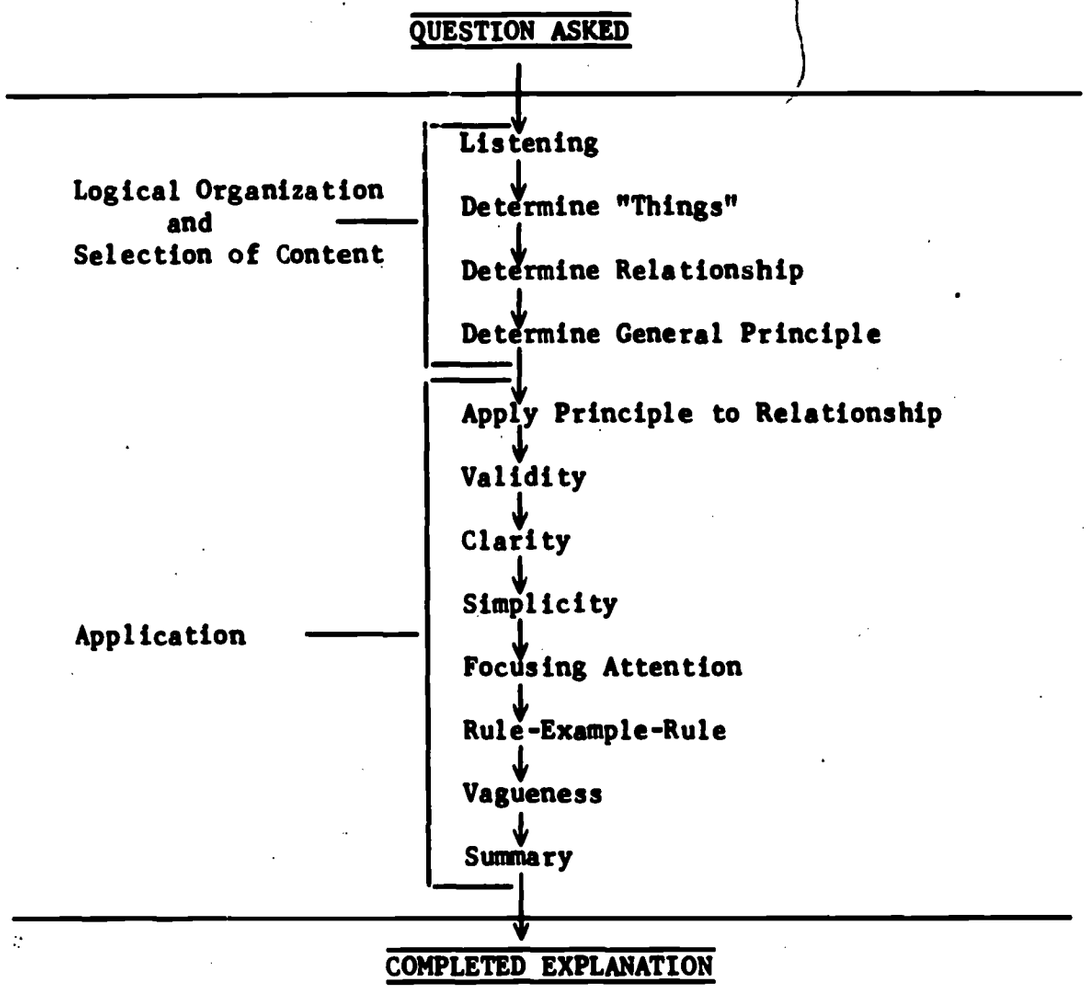


Figure 2. Model for "How to Explain" Manual

important in that if the explainer does not listen carefully there is a very good chance that he will miss something or not completely understand what is being asked. If this happens, his explanation may not be satisfactory. Listening seems like a very simple notion, yet Nichols and Stevens (1957) noted that

> immediately after the average person has listened to someone talk, he remembers only about half of what he has heard -- no matter how carefully he thought he was listening. . . It can be stated, with practically no qualification, that people do not know how to listen.

> They have ears that hear very well, but seldom have they acquired the necessary aural skills which would allow those ears to be used effectively for what is called listening. (p. 85)

Nichols (1963), in cooperation with the Xerox Corporation, developed a listening program that concentrates on (1) building awareness of factors that affect listening ability, and (2) building the kind of aural experience that can produce good listening habits. Since the first task of the explainer is to listen to the question, the listening program was established as the first aspect of the "How to Explain" program.

The other three aspects of the first section of the manual, the "things," relationship, and general principle, were developed primarily from sources related to the study of logic and its relationship to teaching and explaining. Thyne (1963) encouraged the notion of "things," relationship, and general principle when he stated that, "Before even attempting to explain anything to your pupils, state to yourself as clearly and succinctly as possible what it is that calls for an explanation" (p. 154). He states that this can be done by "making explicit the nature of the relation between the thing to be understood and the knowledge required for its understanding" (p. 128), and in order to do this it is necessary to see "this particular thing as an instance of a more general principle" (p. 129). Similarly, Carney and Scheer in their discussion of explaining in logic stated that the ideal form of an explanation occurs when the "explicans contains universal generalizations" (p. 389). They further develop this in their discussion of the answer to the question, "Why are there leucocytes in the blood?"

> To ask this question, in this context, is to ask for the function of leucocytes in the blood. In turn, to ask for their function in this context is to ask for their role in maintaining life in the human body. Or, to put it another way, given a system S (the human body) and a state B (the state of being a living organism), in asking for the function of X (leucocytes) we want to know how X is related to maintaining S in state B. (p. 398)

In his textbook on logic in teaching, Ennis (1969) states that:

> 1. The thing to be explained should be broken up into parts by the explainer, parts which can be made clear in and of themselves.
> 2. The type of relationship between the parts should be settled upon by the explainer. (pp. 256-257)

To Smith and Meux (1962), explaining is a process of logically relating facts and their supportive material to a given principle. They felt that "in every explanation the object, action, event or state of affairs which is the subject of explanation is somehow related to other actions, objects, events, or states of affairs" (p. 140).

The second section of the manual, that of general application, focused on the actual presentation of the explanation. Thyne (1963) sums up the importance of proper application when he noted that

> if understanding is to take place it will be more profitable for the teacher to think, not of ways in which pupils see, but of ways in which material can be presented (p. 140).

The second section of the manual, discusses various ways by which the explainer can make his presentation more effective, i.e., validity, clarity, simplicity, focus, rule-example-rule, vagueness, and summary.

The dimension of validity refers to the truth, correctness, and

accuracy of the explanation. In his discussion of criterion for the adequacy of an explanation, Swift (1961) mentioned the "obvious one of empirical truth. The weight of evidence concerning the explanatory generalizations must support them" (p. 189). Carney and Scheer (1964) stated that "the explicans must be true or corroborated" (p. 418). Similarly, Ennis (1969) stated that "an explanation with a part that is false is ordinarily not an adequate explanation" (p. 281). Copi (1961) sums up the argument for validity in his statement that, "The most obvious requirement to propose is that the explanation be <u>true</u>" (p. 421).

Clarity and simplicity are two dimensions of application that the explainer should be conscious of. Common sense indicates that a confusing and complicated explanation will usually be quite difficult to understand. If possible, it would be better to give a clear and simple explanation. Copy (1961) noted that "the criterion of simplicity is a perfectly natural one to invoke. In ordinary life as well as in science, the simplest theory which fits all available facts is the one we tend to accept" (p. 433). In his chapter on explaining, Ennis (1969) stated that "other things being equal, select the simpler of two gap-fillers" (p. 276). He defined a gap-filler as what the explainer intends to use in completing the explanation. The importance of simplicity and clarity was summed up by Thyne (1963) when he stated that

> it is not difficult to <u>state</u> in a simple and clearcut way precisely what has to happen if someone is to understand. And the more clearly and simply we can state this, the greater the guidance we get in promoting his understanding" (pp. 135-136).

The dimension of focusing attention on important points is related to clarity. Again Thyne (1963) noted that the "first task of the explainer must be to decide precisely what it is that has to be given clarity and be the object of the pupil's seeing" (p. 150). The focusing of attention was discussed in detail by Thyne when he stated that:

> Often the emphasis has to be given, not merely to one word rather than to another, but to a sentence, a paragraph, a chapter, a generalization, a principle, a particular historical event, a method of solution, an arrangement, a proviso, and so forth. The underlining of printed words, or the loud-voiced statements of certain facts, are but simple means of emphasizing the relevant aspects of the material to be understood. Sometimes the relevant emphasis may be obtained by sheer repetition, or by requiring pupils to write about the aspect to be stressed, or by the arousal of emotion, or even by the simple expedient of telling the pupils that this is important and why (p. 143).

In a study which attempted to find ways in which successful teachers differed from less successful teachers when confronted with the task of explaining, Pinney (1969) found focusing attention on important points to be related to the successful teacher's behavior. Pinney was able to investigate the behavior of his subjects (16 high-scoring and 16 low-scoring teachers) in great detail because each subject had been videotaped. In an attempt to identify teacher verbal behaviors related to student-achievement criterion of effectiveness in a 45-minute teaching session, Pinney tested 35 measures of such behavior. Of the 35 measures of verbal behavior, the frequency of verbal markers of importance achieved the highest statistical significance (at the .05 level) as a discriminator between the high-scoring and low-scoring teachers. Pinney defined "verbal markers of importance"

as words and phrases that indicate or announce that a particular point or idea is important. These results suggested that teachers "will achieve their objectives more effectively when certain key points, principles, facts, etc., are consistently highlighted during the course of the lesson" (p. 174).

The rule-example-rule pattern of teacher behavior was identified as important in teacher effectiveness by Rosenshine (1968, 1969). Rosenshine, in a comparison of 15-minute lectures that resulted in relatively high and low student achievement, found that high-scoring lectures differed from low-scoring lectures in the pattern of examples. The high scoring lectures more frequently used a summarizing rule twice, both before and after a series of examples. In contrast, the low-scoring lectures more frequently used only one summary statement, usually before the series of examples. Rosenshine (1969) called the more effective pattern the rule-example-rule pattern, i.e., "a pattern which presents a structuring statement first, follows it with details, concludes with a structuring statement" (p. 714). In a study of differences between high-scoring and low-scoring teachers, using student achievement as a criterion, Shutes (1969) attempted to verify Rosenshine's finding. Shutes closely followed Rosenshine's procedures but found that the rule-example-rule pattern did not significantly discriminate between his high and low groups, as it did for Rosenshine. One explanation could be that Shutes subjects were pre-service interns while Rosenshine's subjects were experienced teachers. At any rate, the rule-example-rule pattern was included in the manual mainly because it had been rated so high by experienced teachers on the basis of value

and learnability (See Table I).

The idea of vagueness as a dimension of lectures was developed by Hiller, et al. (1969), while working on computer programs to count frequencies of stylistic elements in essays. Vagueness was defined as a style characterized by an excessive proportion of words characterized as presenting qualifications, or indicating haziness and ambiguity. Included in his list of vague words and phrases were: "more or less," "some," "pretty much," "somewhat so," "quite a bit," "could be," "might," "possibly," "sometimes," "more often than not," and "most of the time." Hiller used his list and a computer to count the proportion of vague words in 55 lectures.

Drawing together main points in the form of a summary has long been an effective tool in aiding comprehension. The work of Kanner and Marshall (1963) suggests that a summary or review is effective. They used army recruits to test the effects of reviews and previews in enhancing the effectiveness of basic training. They found that groups receiving the reviews learned significantly more than those who did not. Shutes (1969) in his study of high and low scoring teachers, found that the "conclusion is strongly related to the effectiveness of a lesson" (p. 112). Shutes found a number of sub-functions that proved significant at the .05 level. These were (a) teacher applies ideas in lesson to new set of particulars, (b) teacher repeats and emphasizes points within review, (c) teacher asks students to recall specific information, and (d) teacher inquires if students have questions about specific parts of the lesson.

The dimension of summarizing has been used at Stanford University

(Stanford Teacher Education Program, 1968) in the training of new teachers. In a packet of skills called technical skills of teaching, summary is defined as the skill of closure. One aspect of closure is outlined as:

A. Drawing attention to the completion of the lesson or part of the lesson.
   1. Provide consolidation of concepts and elements which were covered before moving to subsequent learning.
   2. Relate lesson back to the original organizing principle.
   3. Review major points using an outline.
   4. Summarize discussion including the major points which were covered by the teacher and class.
   5. Develop all the elements of the lesson into a new unity.
   6. Review major points throughout the lesson.

Summary

The purpose of the present study was to develop and evaluate a manual written for the improvement of teacher effectiveness in explaining. In this chapter the concept of explaining has been defined, its significance in teaching has been explored, and the development and design of the training manual have been discussed.

The teacher, as the leader of learning in the classroom, is often faced with a specific task: to explain. The task of explaining can be divided into two components: (1) the structuring (organization) of content, and (2) the presenting of this structured content. If it can be assumed that aids in improving the two components can be incorporated into a training manual with some degree of effectiveness, then the research task becomes one of assessing the effectiveness.

In assessing the manual's effectiveness, it is necessary to measure its effects on the explanations of subjects who have used the

manual in a training program. The specific dimensions dealt with in this study, the method of appraising the manual's effectiveness, and the results obtained are given detailed treatment in the following chapters.

CHAPTER II

PROCEDURES

The training manual discussed in Chapter I was investigated in this study through an experiment in a pre-service teacher training program. A class of beginning teacher trainees was divided into two groups. All subjects completed a pretest which consisted of answering three stimulus questions asked by an experimenter. After the pretest, one half of the class, the experimental group, received the training manual as the basis for training. The other half, the control group, was not given the training manual. Instead they were given a list of stimulus questions and told to think about how they would respond to questions such as these. All subjects, after training, also completed a posttest which consisted of three different stimulus questions. The pretest and posttest questions and answers were tape recorded. After the collection of the data, the pretest and posttest questions were rated on four dimensions by 7th and 8th grade students. These ratings were then used to test the differences between the experimental and control groups. This chapter describes the experiment in terms of the procedures used in (a) data collection, (b) selection of variables for rating, (c) the collection of the ratings, and (d) statistical analysis.

Data Collection

Subjects. The subjects were 60 new teacher trainees (11 men and 49 women) in a variety of subjects (Table II contains teaching areas of the trainees) enrolled in a graduate level course in Basic Curriculum at the College of Notre Dame in Belmont, California, during the summer

of 1970. All of the subjects were new to teaching, i.e., had had no teaching experience and little or no previous course work in professional education. Half of the subjects, the experimental group, chosen by a table of random numbers, received training in explaining, called the "How to Explain" Program. The other half, the control group, did not. The experimental study was integrated into the total program of the course in order to diminish any possible Hawthorne effect. All of the activities required during the actual experimental study, i.e., tape recorders, large and small groups, videotape instructions, questionnaires, and short readings to be done the night before the next class session, had been introduced earlier in the course as part of other projects, so that they were familiar when they appeared during the actual study.

Orientation. The administration of the "How to Explain" Program was complicated by the fact that provisions had to be made for both an experimental and a control group. An orientation session was held the day before the pretest in order to introduce the procedures each group would follow and resolve scheduling problems. During the orientation session the experimental group viewed Introductory Videotape A. The control group viewed Introductory Videotape B. (Appendix B contains transcripts of the Introductory Videotapes.) The videotapes explained the format of the experiment to each group and differed only in that the experimental group received information about the written materials they were to receive. Both groups received information on when to report for the pretest.

TABLE II

TEACHING AREAS OF TRAINEES IN THE EXPERIMENTAL AND CONTROL GROUPS

Teaching Area	Experimental Group Subjects N = 30	Control Group Subjects N = 30
Social Studies	11	9
English	8	10
Foreign Language	6	7
Science/Math	2	1
Art	2	1
Home Economics	1	2

Pretest. The pretest was administered to all subjects on the day after the orientation. The pretest for both groups consisted of the subject's explaining something in response to a stimulus question asked by the experimenter. Each subject in the pretest sessions was asked to explain three things. The directions suggested what exploratory studies had shown to be feasable, namely, that the subject should be able to complete his explanation in not more than about four minutes.

Six stimulus questions were randomly divided into two sets with three questions each. Half of the experimental and half of the control group were assigned to one set of stimulus questions, and the other half of each group to the other set for the pretest. (Figure 3 contains questions in Set 1 and Set 2) This sequence was reversed for the posttest. This procedure controlled for the difficulty of the questions and also insured that subjects did not get the same questions on the posttest that they received on the pretest. Table III illustrates the procedure used for administering the pretest and posttest.

Each subject was instructed to imagine he was explaining the questions to 7th and 8th grade students and to answer the stimulus

Set 1

1. Why does climate affect the way people dress?

2. Why must we conserve our trees?

3. Why are good transportation facilities important to farmers?

Set 2

1. How does the growth of factories affect the growth of cities?

2. Why did men first settle in river valleys?

3. Why is air pollution a greater problem now than in the past?

Figure 3. Stimulus Questions - Set 1 and Set 2

TABLE III

QUESTION SEQUENCE FOR PRETEST AND POSTTEST

	Sequence A Set 1 then Set 2	Sequence B Set 2 then Set 1
Experimental Group A (N = 15)	X	
Experimental Group B (N = 15)		X
Control Group A (N = 15)	X	
Control Group B (N = 15)		X

questions from that frame of reference. All explanations were tape recorded, and all subjects were asked not to discuss the questions with their fellow students. (See the Administration Manual for the "How to Explain" Program in Appendix B for detailed procedures for the pretest.)

In order to obtain the stimulus questions to be used for the pretest and the posttest, a list of 32 possible stimulus questions

was developed. These questions were rated by 31 student teachers as to whether they could answer the questions or not. The Stimulus Question Rating Sheet used for this purpose is presented in Figure 4. The results of the rating are shown in Table IV. There were six questions (Questions 2, 4, 7, 13, 25, and 26) that 88% or more of the raters felt they could give short answers to. (The numbers in Table IV correspond to the numbers of the questions on the Stimulus Question Rating Sheet in Figure 4.) These six stimulus questions were then randomly divided into the two sets, Set 1 and Set 2.

Stimulus Question Rating Sheet

INSTRUCTIONS

Listed below are a number of questions for you to read. As you read a question, imagine that a student is asking you this question. If you feel that you could give a short, 2 to 3 minute, answer to the question, circle the word "Yes" that follows the question. If you do not think you could give a short answer, circle the word "No." Do this for all of the questions.

QUESTIONS

1. Why do industries spend huge amounts of money on advertising? Yes No
2. How does the growth of factories affect the growth of cities? Yes No
3. Why have we set aside lands for parks and recreation? Yes No
4. Why are good transportation facilities important to farmers? Yes No
5. Why are adult education programs important? Yes No
6. Why do scientists do experiments? Yes No
7. Why does climate affect the way people dress? Yes No
8. Why are newspapers important? Yes No
9. Why did the indians attack the colonists? Yes No
10. Why do we have to pay taxes? Yes No
11. Why did the settlers move west? Yes No
12. Why were most of the early railroad lines built in the Eastern United States? Yes No
13. Why is air pollution a greater problem now than in the past? Yes No

(continued on the next page)

Stimulus Question Rating Sheet (continued)

14. Why should everyone be concerned with water pollution?	Yes	No
15. Why are the rains in the spring very important?	Yes	No
16. Why is the sun important to us?	Yes	No
17. Why is summer the warmest season and winter the coldest?	Yes	No
18. Why should you periodically change the water in a fishbowl?	Yes	No
19. Why do we have day and night?	Yes	No
20. Why is the time different in different parts of the country?	Yes	No
21. Why is moonlight really sunlight?	Yes	No
22. Why is a compass so useful?	Yes	No
23. Why should you call a doctor if you are sick?	Yes	No
24. Why do you need exercise and rest?	Yes	No
25. Why must we conserve our trees?	Yes	No
26. Why did men first settle in river valleys?	Yes	No
27. How is tax money used?	Yes	No
28. How does trade help the growth of towns?	Yes	No
29. Why is freedom so important?	Yes	No
30. Why does Russia have a transportation problem?	Yes	No
31. Why is the United States interested in what goes on in Europe?	Yes	No
32. Why is soil one of our most valuable resources?	Yes	No

Figure 4. Stimulus Question Rating Sheet Used to Obtain Judgments as to the Answerability of the Questions

Treatment. The experimental group used the training manual as the basis for training. The five lessons in the manual were done on successive days in five one-hour sessions. Each lesson with its written exercises was handed out the day before the practice session. Each practice session called for subjects to have read in advance and completed the exercises in the assigned material for that session. In Lesson 1 the practice procedure was similar to that of a programmed tape for training in listening skills: the Effective Listening Program by Nichols (1963). In the other four practice sessions the subjects

TABLE IV

RATINGS BY 31 RATERS OF PROSPECTIVE STIMULUS QUESTIONS

Question Number	Percentage of Raters Answering Yes	Question Number	Percentage of Raters Answering Yes
1	81%	17	63%
2	88%*	18	72%
3	78%	19	66%
4	91%*	20	53%
5	75%	21	44%
6	72%	22	66%
7	91%*	23	81%
8	81%	24	78%
9	59%	25	94%*
10	69%	26	91%*
11	75%	27	53%
12	72%	28	78%
13	91%*	29	44%
14	81%	30	28%
15	63%	31	47%
16	78%	32	75%

* Questions receiving 88% or more "Yes" answers.

worked with a self-selected fellow trainee. At the beginning of each practice session, videotaped instructions and instructional packets were given to each trainee. During the practice session, in accordance with the instructions, Trainee A of each pair asked Trainee B to explain a specific given matter. All practice explanations were tape recorded. This was then followed by a critique led by Trainee A, in which both trainees listened to and discussed the tape recording of the explanation. This same procedure was then reversed with Trainee B asking the stimulus question and Trainee A responding. Trainee B then led the critique as both listened to the playback of the tape recording. (Appendix B contains the Administration Manual for the "How to Explain" Program, practice session instructions and questions, and sample

transcripts of Videotaped Instructions. Appendix E contains the questionnaires for all sessions.)

The control group was not given the training manual. Instead it was given a list of stimulus questions and asked to "spend the rest of the period thinking to yourself how you would answer questions such as these. Imagine you were responding to a 7th or 8th grade class." The control group presumably followed these directions during the time the experimental group was going through its practice sessions.

Posttest. All of the subjects, after the training period, were required to take a posttest conducted exactly like the pretest, except that the stimulus questions were not the same as those for the pretest. (See Table III for the sequencing of the pretest and posttest.)

Rating Procedures

As was stated in Chapter I, teacher explaining behavior is defined as behavior directed toward improving student understanding. When thought of as a task, effective explaining can be regarded as consisting of at least two major sub-tasks: (1) the organization and (2) the presentation of the selected content. Organization deals with those behaviors which effect the structure and sequence of the content to be explained. Presentation deals with those teacher behaviors which affect the delivery of the organized content. It is clear that organization and presentation are not independent of each other during a teacher's oral and extemporaneous explanation. This study was directed toward the examination of those behaviors related to organization and presentation that contribute to effective explaining.

The development of the manual suggested several variables that

might be of use in evaluating the pretest and posttest questions. Some of these were organization, clarity, simplicity, quality, validity, and summary. The main concern was to develop a rating sheet which contained meaningful variables and could be effectively and reliably used by student raters. A rating sheet that was too complicated would confuse the raters and diminish the reliability, while a rating sheet that was too simple would not adequately assess the quality of the pre- and posttests.

Three practice rating sheets containing what appeared to be promising variables, i.e., simplicity, clarity, summary, quality, intelligibility, correctness, orderliness, design, comprehensibility, precision, appreciation, organization, impression, form, and rank among explanations of a given explainer, were developed. These practice rating sheets were tested on 10 student raters (7th and 8th grade), using 6 practice tape recorded answers. Four of the dimensions showed an 80% or better rater agreement. These four dimensions were (a) organization (80%), (b) clarity (82%), (c) quality (88%), and (d) rank among six explanations (80%). These dimensions were used as the basis for evaluating the subjects' answers on the pretest and posttest.

After the dimensions had been chosen, the basic steps in developing the rating procedures were to develop the rating sheet, define each dimension, and develop instructions for raters. These were developed and tested with the aid of student raters. The raters used in this developmental work were not used later in the actual rating of experimental data. Problems with the rating sheet, definitions, and instructions were resolved during the training period, which included the practice rating of 6 tape recorded explanations. The

reactions, comments, and suggestions from the practice raters proved to be extremely valuable. Their reactions to the rating sheet led the writer to change the format and sequence so that they were understandable by the raters. Their question on the definitions and instructions also required changes and clarifications until the raters felt they could understand exactly what was meant. (Appendix C contains the Student Rating Manual, which consists of the rating sheet, definitions, and rater instructions.)

For the actual rating of the experimental data, the answers to both the pretest and the posttest stimulus questions for each subject were transferred to another tape in random order. The six answers were then played in the random order to 10 student raters who were in the 7th and 8th grade. The 7th and 8th graders were used as raters because the trainees had worked with this age group earlier in the semester and it was felt that they would be able to direct their answers best toward this age group. (Appendix C contains transcripts of sample pretest and posttest answers.) The student raters, using the rating sheet, then rated each answer on four dimensions: (a) organization, (b) clarity, (c) quality, and (d) rank among the six answers for that subject. Any one rater rated only one subject, therefore there were 600 raters (10 raters per subject and 60 subjects). A detailed explanation of the mechanics of the rating procedure is presented in the Rating Manual in Appendix C.

Statistical Procedures

The first step in the analysis was to estimate the interrater reliability of the ratings. From an analysis of variance table, the

Horst formula (Horst, 1949) was used to estimate rater reliability. Basically this procedure bases the estimate of reliability of the mean of all the judges' ratings on each dimension on the following computation:

$$r = 1 - \frac{\sum \frac{\sigma_i^2}{Ni-1}}{\frac{N}{\sigma_M^2}}$$

where r = an estimate of the reliability of the individual means, M_i,

N = number of persons rated,

M_i = mean of the ratings received by person i,

n_i = number of ratings made of each person i,

σ_i = the standard deviation of the ratings of person i,

σ_M = the standard deviation of the mean ratings received by the N persons.

In this formula, the variance due to the true scores (mean squares within teachers) is divided by the sums of the variance due to the true scores and variance due to error of measurement (mean square between teachers).

Analyses of variance were used to test the significance of the differences between the mean posttest ratings of the experimental and control groups on each of the four dimensions. The results, interpretations, and conclusions are given detailed treatment in the following chapters.

CHAPTER III

RESULTS: RATINGS OF THE EXPLANATIONS

The procedures described in Chapter II were developed in order to obtain data on the effectiveness of the training manual. It will be recalled that a class of students was randomly divided into two groups. All subjects completed a pretest consisting of three questions to be answered orally. One group then received the training based on the manual, while the other group did not. At the end of the training period, all subjects took a posttest exactly like the pretest except that different questions were used. Each of the 60 subjects' tape recorded pretest and posttest answers were then rated by 10 junior high school students unique to that subject. This chapter describes the procedures used in preparing the data for analysis and presents the results of the analysis.

Data Preparation

The three pretest and three posttest tape recorded answers for each subject were transferred to another tape in random order as previously described. The six answers were then played to ten student raters. These raters, using the rating sheet, then rated each question of four dimensions: (a) organization, (b) clarity, (c) quality, and (d) rank among the six answers. The organization, clarity, and quality dimensions were rated as either Excellent, Good, Average, Below Average, or Very Poor. These ratings were transferred to data cards utilizing a five-point scale, from 5 for Excellent to 1 for Very Poor. The rankings were made after the other three dimensions were rated.

The ranks were from 1 to 6, with six being the best and 1 being the worst answer for that subject. Therefore, the numerical information for each subject on each answer consisted of four scores: (a) a score from 1 to 5 for the organization dimension, (b) a score from 1 to 5 for the clarity dimension, (c) a score from 1 to 5 for the quality dimension, and (d) a score from 1 to 6 for the rank. Each subject had ten such scores (10 raters per subject) on each of his six answers. All pertinent information on each subject was punched onto IBM cards in preparation for the statistical analysis.

Analysis

Reliability. Table V shows the reliability coefficients for the ratings of all of the pretest and posttest questions for both Sequence A and Sequence B for the rank, organization, clarity, and quality dimensions. The tables show that all of the reliability coefficients equal .76 or better, and indicate that rater agreement on all dimensions was high. Once the reliability of the raters was established, it was decided to investigate the relationship between the organization, clarity, and quality dimensions. The original data indicated that these three dimensions were highly correlated with each other. Tables VI through XII show the correlations between ratings on organization, clarity, and quality dimensions. These tables support the hypothesis that the three dimensions are highly correlated. This suggests that the three separate ratings may properly be regarded as ratings of one general dimension.

Differences Between Means. An analysis of covariance was undertaken with the results showing that the experimental and control groups

TABLE V

RELIABILITY OF MEAN RATINGS BY 10 JUDGES FOR SEQUENCE A AND B PRETEST AND POSTTEST QUESTIONS ON RANK, ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Rank		Organization		Clarity		Quality	
	SeqA	SeqB	SeqA	SeqB	SeqA	SeqB	SeqA	SeqB
Pretest 1	.95	.95	.92	.93	.93	.91	.94	.93
Pretest 2	.94	.95	.94	.91	.90	.92	.92	.93
Pretest 3	.94	.92	.91	.91	.94	.88	.93	.91
Posttest 1	.94	.90	.93	.76	.92	.82	.93	.83
Posttest 2	.96	.94	.95	.91	.95	.91	.94	.92
Posttest 3	.94	.93	.92	.78	.92	.84	.90	.89

differed significantly at the .01 level on all four dimensions (analysis of covariance tables are shown in Appendix D). It was noticed, however, that the control group's pretest means were higher, on all four dimensions, than the experimental group's pretest means, as shown in Table XIII, which presents the means for both the experimental and control groups on all dimensions. This difference when incorporated into the analysis of covariance, could heighten the difference between the two groups. An analysis of variance, therefore, was undertaken to test the significance of the posttest differences only. As seen in Table XIV, the results of the analysis of variance of the posttest means for the experimental and control groups are significant at the .01 level on all four dimensions. At this point it was decided to determine whether the pretest means differed significantly between the two groups. Table XV shows that the pretest means of the experimental and control groups did differ significantly at the .05 level, with the control group's mean pretest scores significantly higher than the

TABLE VI

EXPERIMENTAL GROUP - SEQUENCE A

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest			Posttest		
				Organization	Clarity	Quality	Organization	Clarity	Quality
Pretest									
Organization	88.93	12.91	15	1.000	.888	.939	.694		
Clarity	86.80	14.11	15		1.000	.932		.676	
Quality	86.53	13.58	15			1.000			.754
Posttest									
Organization	110.00	14.91	15				1.000	.962	.961
Clarity	109.33	15.16	15					1.000	.952
Quality	111.40	15.23	15						1.000

TABLE VII

EXPERIMENTAL GROUP - SEQUENCE B

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest			Posttest		
				Organization	Clarity	Quality	Organization	Clarity	Quality
Pretest									
Organization	86.60	9.52	15	1.000	.824	.937	.483		
Clarity	80.80	8.81	15		1.000	.902		.579	
Quality	83.87	10.74	15			1.000			.382
Posttest									
Organization	107.27	7.33	15				1.000	.861	.930
Clarity	106.27	8.00	15					1.000	.854
Quality	109.33	10.00	15						1.000

*Each mean is the sum of 10 judges' ratings of three questions; to convert to the five-point metric (5 = Excellent, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor) each mean should be divided by 30.

TABLE VIII

EXPERIMENTAL GROUP - ALL QUESTIONS

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest Organization	Pretest Clarity	Pretest Quality	Posttest Organization	Posttest Clarity	Posttest Quality
Pretest									
Organization	87.77	11.21	30	1.000	.859	.938	.633		
Clarity	83.80	11.21	30		1.000	.909		.656	
Quality	85.20	12.11	30			1.000			.627
Posttest									
Organization	108.63	11.63	30				1.000	.941	.946
Clarity	107.80	12.00	30					1.000	.923
Quality	110.37	12.70	30						1.000

TABLE IX

CONTROL GROUP - SEQUENCE A

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest Organization	Pretest Clarity	Pretest Quality	Posttest Organization	Posttest Clarity	Posttest Quality
Pretest									
Organization	98.27	12.75	15	1.000	.955	.967	.340		
Clarity	97.87	13.23	15		1.000	.947		.564	
Quality	99.93	13.45	15			1.000			.534
Posttest									
Organization	96.20	10.83	15				1.000	.960	.956
Clarity	93.80	12.16	15					1.000	.951
Quality	97.13	12.65	15						1.000

*Each mean is the sum of 1 judges' ratings of three questions; to convert to the five-point metric (5 = Excellent, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor) each mean should be divided by 30.

TABLE X

CONTROL GROUP - SEQUENCE B

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest			Posttest		
				Organization	Clarity	Quality	Organization	Clarity	Quality
Pretest									
Organization	99.53	10.68	15	1.000	.956	.961	.215		
Clarity	96.27	9.20	15		1.000	.948		.245	
Quality	99.00	11.72	15			1.000			.148
Posttest									
Organization	103.73	9.82	15				1.000	.858	.961
Clarity	102.07	11.04	15					1.000	.898
Quality	103.60	9.98	15						1.000

TABLE XI

CONTROL GROUP - ALL QUESTIONS

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest			Posttest		
				Organization	Clarity	Quality	Organization	Clarity	Quality
Pretest									
Organization	98.90	11.57	30	1.000	.943	.959	.286		
Clarity	97.07	11.22	30		1.000	.941		.383	
Quality	99.47	12.43	30			1.000			.349
Posttest									
Organization	99.97	10.85	30				1.000	.924	.957
Clarity	97.93	12.16	30					1.000	.932
Quality	100.37	11.67	30						1.000

*Each mean is the sum of 10 judges' ratings of three questions; to convert to the five-point metric (5 = Excellent, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor) each mean should be divided by 30.

TABLE XII

BOTH EXPERIMENTAL AND CONTROL - TOTAL

CORRELATIONS BETWEEN RATINGS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Mean*	SD	N	Pretest Organization	Pretest Clarity	Pretest Quality	Posttest Organization	Posttest Clarity	Posttest Quality
Pretest									
Organization	99.33	12.61	60	1.000	.921	.959	.223		
Clarity	90.43	13.30	60		1.000	.944		.225	
Quality	92.33	14.13	60			1.000			.195
Posttest									
Organization	104.30	11.98	60				1.000	.942	.958
Clarity	102.87	12.97	60					1.000	.937
Quality	105.37	13.10	60						1.000

*Each mean is the sum of 10 judges' ratings of three questions; to convert to the five-point metric (5 = Excellent, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor) each mean should be divided by 30.

TABLE XIII

SUMMARY OF PRETEST AND POSTTEST MEANS FOR EXPERIMENTAL (N=30) AND CONTROL (N=30) GROUPS ON RANK, ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

	Experimental Group Mean*	Control Group Mean*
Pretest		
Organization	87.77	98.90
Clarity	83.80	97.07
Quality	85.20	99.47
Rank	72.07	104.00
Posttest		
Organization	108.63	99.97
Clarity	107.80	97.93
Quality	110.37	100.37
Rank	137.90	106.43

*Each mean is the sum of 10 judges' ratings of three questions; to convert to the five-point metric (5 = Excellent, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor) each mean should be divided by 30.

TABLE XIV

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL POSTTESTS ON RANK, ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

Source of Variation	Sum of Squares	df	Mean Square	F
RANK DIMENSION				
Between Experimental and Control Groups (E)	14852.27	1	14852.27	81.25**
Between Sequence Groups (S)	224.27	1	224.27	1.23
Interaction (ExS)	375.00	1	375.00	2.05
Error	10236.80	56	182.80	
Total	25688.34	59		
ORGANIZATION DIMENSION				
Between Experimental and Control Groups (E)	1126.67	1	1126.67	9.20**
Between Sequence Groups (S)	86.40	1	86.40	.71
Interaction (ExS)	395.27	1	395.27	3.23
Error	6860.27	56	122.51	
Total	8468.61	59		

**Significant at the .01 level.

TABLE XIV (continued)

Source of Variation	Sum of Squares	df	Mean Square	F
CLARITY DIMENSION				
Between Experimental and Control Groups (E)	1460.27	1	1460.27	10.37**
Between Sequence Groups (S)	101.40	1	101.40	.72
Interaction (ExS)	481.67	1	481.67	3.42
Error	7885.60	56	140.81	
Total	9928.94	59		
QUALITY DIMENSION				
Between Experimental and Control Groups (E)	1500.00	1	1500.00	10.14**
Between Sequence Groups (S)	72.60	1	72.60	.49
Interaction (ExS)	273.07	1	273.07	1.85
Error	8286.27	56	147.97	
Total	10121.94	59		

**Significant at the .01 level.

TABLE XV

TEST FOR EQUALITY OF PRETEST MEANS

EXPERIMENTAL AND CONTROL GROUPS (N = 60)

	Pretest Mean	Pretest SD	t
ORGANIZATION			
Experimental (N = 30)	87.8	11.2	3.8
Control (N = 30)	98.9	11.6	
CLARITY			
Experimental (N = 30)	83.8	12.00	4.46
Control (N = 30)	97.1	11.2	
QUALITY			
Experimental (N = 30)	85.2	12.1	4.55
Control (N = 30)	99.5	12.4	

H: $\mu_E = \mu_C$

α = .05

t = reject if t > 2.00

df 58

experimental groups. Since the subjects had been divided randomly into two groups, this significant difference was not expected. The most probable explanation appeared to be that the differences were caused by the rating procedure. Since all six (3 pretest and 3 posttest) were rated at the same time, it was possible that the raters listening to the experimental group's subjects heard a very good posttest answer and then rated the pretest answers much lower in comparison. The control group raters did not necessarily hear a markedly superior posttest answer and, therefore, they may have tended to rate the pretest ratings by the posttest ratings and vice-versa, either the posttest experimental means are really higher depressing the pretest means or the pretest means are really lower, and artificially heightening the posttest means. The most important question was whether there was, in fact, an artificial heightening of the posttest means. One way to check this was to re-rate some of the subjects' posttest answers without rating the pretest answers.

Owing to time, expense, and logistical factors it was decided to use only five (rather than the original 10) raters per subject and to re-rate only half of the subjects. The subjects chosen for re-rating were all those in the experimental and control groups who received the Sequence A pretest and posttest (N = 30). The three posttest questions of each of the thirty subjects were then re-rated (5 raters per subject; 150 raters). The same instructions as were used in the original ratings were used in the re-rating. The only differences in the re-rating procedures were that only the posttest was rated and that the rank dimension was eliminated.

The analyses of the re-rated data are shown in Tables XVI through XIX. The reliability coefficients, shown in Table XVI, again proved to be high, with the lowest figure being $\underline{r} = .80$. Overall, the reliability of the ratings was below that achieved by the original ratings, but this was expected as only five raters were used rather than the original ten.

Table XVII shows the correlations between dimensions. The correlations between the organization, clarity, and quality dimensions for the re-rated data were very high, resembling those for the original ratings and suggesting that there was really one rating rather than three.

The analysis of variance for each of the three dimensions, shown in Table XVIII yielded results similar to those of the original data, with the differences between experimental and control groups means significant at the .01 level for the organization and quality dimensions and at the .05 level for the clarity dimension.

Table XIX answers the major question of whether the posttest means of the original ratings were equal to the posttest means of the re-ratings. Table XIX does not justify rejecting the hypothesis that the means of the original and re-rated data are equal. Hence we have support for the original speculation that the original experimental pretest ratings were depressed by being rated together with the experimental posttest ratings. When the posttest ratings are rated separately from the pretest ratings, those of the experimental group persisted in being significantly higher than those of the control group. However, for all groups on all tests the second ratings are lower than

TABLE XVI

RELIABILITY OF MEANS OF FIVE RATINGS ON THE ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS (RE-RATED POSTTEST QUESTIONS ONLY)

EXPERIMENTAL AND CONTROL SUBJECTS (N = 30)

Dimension	Posttest Question	r
ORGANIZATION	1	.84
	2	.84
	3	.80
CLARITY	1	.87
	2	.83
	3	.87
QUALITY	1	.82
	2	.81
	3	.80

TABLE XVII

MEANS, STANDARD DEVIATIONS, AND INTERCORRELATIONS OF RE-RATED GROUPS POSTTEST EXPLANATIONS (N = 15)

Experimental Group - Sequence A	Mean*	SD	r_s Clarity	r_s Quality
Posttest				
Organization	52.00	8.51	.96	.92
Clarity	50.60	8.30		.93
Quality	52.13	8.24		
Control Group - Sequence A	**Mean***	**SD**	**r_s Clarity**	**r_s Quality**
Posttest				
Organization	44.80	5.44	.86	.90
Clarity	45.07	5.71		.94
Quality	45.27	5.11		

*Each mean is the sum of 5 judges' ratings of three questions; to convert to the five-point metric (5 = Excellent, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor) each mean should be divided by 15.

TABLE XVIII

ANALYSES OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL RE-RATED POSTTESTS ON ORGANIZATION, CLARITY, AND QUALITY DIMENSIONS

Source of Variation	Sum of Squares	df	Mean Square	F
ORGANIZATION DIMENSION (Re-Rated Posttests)				
Between Experimental and Control Groups	388.80	1	388.80	7.62**
Within Experimental and Control Groups	1428.40	28	51.01	
Total	1817.20	29		
CLARITY DIMENSION (Re-Rated Posttests)				
Between Experimental and Control Groups	229.63	1	229.63	4.53**
Within Experimental and Control Groups	1420.53	28	50.73	
Total	1650.16	29		
QUALITY DIMENSION (Re-Rated Posttests)				
Between Experimental and Control Groups	353.63	1	353.63	7.53**
Within Experimental and Control Groups	1314.67	28	46.95	
Total	1668.30	29		

**Significant at the .05 level.

TABLE XIX

TEST OF EQUALITY OF POSTTEST MEANS: ORIGINAL AND RE-RATED GROUPS

Dimension	Mean	SD	t
ORGANIZATION			
Experimental Group 1	110.0	14.9	1.03
Experimental Group 2	104.0	17.0	
Control Group 1	96.2	10.8	1.74
Control Group 2	89.6	10.8	
CLARITY			
Experimental Group 1	109.3	15.2	1.42
Experimental Group 2	101.2	16.6	
Control Group 1	93.8	12.2	.86
Control Group 2	90.2	11.4	
QUALITY			
Experimental Group 1	111.4	15.2	1.26
Experimental Group 2	104.2	16.4	
Control Group 1	97.1	12.7	1.63
Control Group 2	90.4	10.2	

Prefix 1 = Original data
Prefix 2 = Re-rated data
H: $U_1 \leq U_2$
H: $U_1 = U_2$
α = .05
t = reject if t > 2.048
df 28

the first, although no single comparison is statistically significant. There probably is a rating effect, but it isn't large compared to the treatment effect.

CHAPTER IV

RESULTS: CONTENT ANALYSES OF THE EXPLANATIONS

The results discussed in Chapter III indicated that the experimental group's explanations differed significantly, on four highly intercorrelated dimensions, from those of the control group. The question of whether some of this difference could be attributed to differences on the specific dimensions of explaining behavior stressed in the manual should be explored. If the manual did not contribute to this difference, then it is possible that the groups differed simply because of the more extensive practice that the experimental group experienced.

To investigate this question, an analysis of the content of a random selection of experimental and control posttest explanations was made. Six experimental and six control subjects were randomly selected from the group of 30 subjects (15 experimental and 15 control) that received the Sequence A stimulus questions. The three posttest answers of each of the twelve subjects were transcribed. The result was 36 transcribed explanations (12 subjects with three posttest explanations for each subject). If it were possible to relate some aspects of the content of the explanations to ideas stressed in the "How to Explain" manual, and if these aspects were found better exemplified in the explanations of the experimental group, then there would be some basis for concluding that the manual did play a role in making the experimental group's explanations better than those of the control group.

Variable Selection and Coding Procedures

The first task was to identify variables stressed in the "How to Explain" manual that might be observable in the sample explanations, and then develop coding procedures for these variables. It appeared that it might be possible to identify whether an explainer (a) overtly mentioned the "things," relationship, and general principle, (b) made a valid explanation, (c) focused on important points, (d) used the rule-example-rule pattern, (e) avoided vague words, and (f) used a summary.

Fortunately, the research cited in Chapter I to justify the emphasis on these six variables in the manual also contained some suggestions for rating these variables. Particularly useful was the research by Hiller (1969), Pinney (1969), Rosenshine (1968), and Shutes (1969). These four researchers had explored most of these variables in their studies and, therefore, had developed some coding procedures which, with some modifications, could be applied to this study.

The steps in developing coding procedures with which to analyze the 36 explanations included (a) defining the general dimensions to be investigated, (b) defining each dimension operationally, and (c) developing a coding manual for each dimension. Each coding manual contained definitions, examples, and specific rules and procedures. (Appendix C contains a copy of all the coding manuals.) Three coders (graduate students, one in education and two in biology) were selected and trained. In training, they practiced on explanations other than those in the sample chosen. During the training session (each lasting from one to two hours), the objectives and procedures were explained, questions were

answered, and practice transcripts were coded. Once the coders understood the procedure and all questions were answered, each was given a set of the 36 transcripts in a random order for coding.

Once the transcripts had been coded, inter-rater agreement was determined in terms of correlation coefficients between raters. One exception to this procedure was the coding of the vagueness category. This category was not coded by raters, but rather with the aid of a computer, using a vagueness dictionary developed by Hiller (1969). The coding of the vagueness dimension will be discussed in greater detail later in the chapter. Analyses of variance were used to test the significance of the differences between the mean ratings of the experimental and control groups on the selected dimensions. (Appendix D contains the complete analysis of variance tables for each dimension.)

THe six dimensions investigated are reported below. Each dimension is defined, coding and scoring procedures are outlined, and results are reported.

Content Validity

Content validity was the first dimension investigated. Content validity refers to the degree to which the content of the explanations was related to the right answer. This dimension was discussed in Lesson 3 of the "How to Explain" manual, and the justification of this variable was previously given in Chapter I in the section on the design of the training manual. Validity was defined as the degree to which the explanation was true, correct, and accurate. If the manual's treatments of validity had an effect on the experimental subjects, then it should be observable in their explanations. The rating task for this

particular variable was basically subjective. That is, within the basic rules and procedures, the task was to rate the validity of a particular explanation as they saw it. A five-point scale was used, with 5 denoting an adequate right answer and 1 denoting a wrong answer. (Appendix C contains a copy of the directions for rating content validity.)

Table XX shows the correlation coefficients indicating inter-rater agreement for content validity. The coefficients for this dimensions, as for all dimensions, were high, indicating a satisfactory level of rater agreement. As shown in Table XXI, the results of the analysis of variance are significant at the .01 level. Within each topic the experimental group exhibited a higher mean rating than that of the control group.

This suggests that the section of the "How to Explain" manual that was concerned with content validity did have an effect on the experimental group's responses to the stimulus questions. The experimental group subjects presumably were made more aware that the accuracy and truth of the explanation was important, and made a greater effort to make their explanations as complete and valid as possible.

Logical Organization

The concept of logical organization was drawn from Lesson 2 of the "How to Explain" manual. This lesson discussed the logical organization of an explanation in terms of three steps: (a) the identification of the "things" involved, (b) the identification of the relationship between these things, and (c) the identification of the general principle involved. The development of logical organization is discussed in Chapter I. In the coding of logical organization, the

TABLE XX

INTER-RATER AGREEMENT FOR CONTENT ANALYSIS VARIABLES (N = 36)

Variable	Rater Pair	$\bar{X}$	σ_X	$\bar{Y}$	σ_Y	r_{XY}
Content Validity	A vs B	3.86	1.05	3.75	0.93	.90
	A vs C	3.86	1.05	3.72	1.09	.92
	B vs C	3.75	0.93	3.72	1.09	.88
Logical Organization-Things	A vs B	0.36	0.49	0.31	0.47	.88
	A vs C	0.36	0.49	0.33	0.48	.94
	B vs C	0.31	0.47	0.33	0.48	.94
Logical Organization-Relationship	A vs B	0.19	0.40	0.14	0.35	.82
	A vs C	0.19	0.40	0.19	0.40	1.00
	B vs C	0.14	0.35	0.19	0.40	.82
Logical Organization-General Principle	A vs B	0.11	0.32	0.14	0.35	.88
	A vs C	0.11	0.32	0.14	0.35	.88
	B vs C	0.14	0.35	0.14	0.35	1.00
Verbal Emphasis	A vs B	1.61	1.36	1.56	1.46	.95
	A vs C	1.61	1.36	1.61	1.52	.94
	B vs C	1.56	1.46	1.61	1.52	.94
Rule-Example-Rule: Examples with rules before and after	A vs B	0.53	0.61	0.47	0.56	.93
	A vs C	0.53	0.61	0.47	0.61	.93
	B vs C	0.47	0.56	0.47	0.61	.84
Rule-Example-Rule: Examples with rules before	A vs B	0.44	0.56	0.36	0.49	.86
	A vs C	0.44	0.56	0.44	0.56	1.00
	B vs C	0.36	0.49	0.44	0.56	.86
Rule-Example-Rule: Examples with rules after	A vs B	0.08	0.28	0.06	0.23	.80
	A vs C	0.08	0.28	0.08	0.28	1.00
	B vs C	0.06	0.23	0.08	0.28	.80
Rule-Example-Rule: Examples only	A vs B	1.06	0.63	0.89	0.62	.82
	A vs C	1.06	0.63	1.00	0.63	.93
	B vs C	0.89	0.62	1.00	0.63	.73
Introduction: Visibility	A vs B	0.31	0.47	0.25	0.44	.87
	A vs B	0.31	0.47	0.33	0.48	.94
	B vs C	0.25	0.44	0.33	0.48	.82
Summary: Visibility	A vs B	0.94	0.89	0.89	0.82	.89
	A vs C	0.94	0.89	0.92	0.87	.87
	B vs C	0.89	0.82	0.92	0.87	.86

TABLE XXI

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL RATINGS ON CONTENT VALIDITY DIMENSION

		Mean Rating by Three Judges			
Group	N	Topic A	Topic B	Topic C	Total
Experimental Group	6	4.50	4.67	4.17	4.44
Control Group	6	3.17	3.00	3.17	3.11
Total	12	3.83	3.83	3.67	

F: Between Groups - 22.50**
F: Between Topics - .17
F: Groups X Topics - .47

**$p < .01$

coders were specifically instructed to code only those instances of "identification of things," "identification of relationships," and "identification of general principles" which clearly indicated that the explainer was attempting to identify those instances to himself. For example, such statements as, "What we are talking about here is pollution controls and the price of a new car," or "Hmm, pollution controls and price of new car," would be coded as verbalizing "things," because they clearly indicate that the explainer is attempting to clarify the things to himself. On the other hand, statements such as, "The price of a new car will increase as pollution controls. . ," or "Pollution controls do increase the price of a new car because. .," would not be coded as "things" because these statements are really part of the body of the explanation and not organizational statements.

Although the experimental subjects were not specifically instructed to verbalize the things, relationship, and general principle, it was felt that their explanations would have a high probability

of containing such statements because of the focus placed on these aspects in the manual.

Table XX illustrates the high reliability coefficients for the coders on three dimensions of logical organization. The results of the analysis of variance (Table XXII) for logical organization show that the experimental group more often made reference to the "things" to be explained ($p < .01$) and more often verbalized the essential relationships ($p < .05$), but did not differ from the control group in mentioning the general principle involved in the explanation.

The investigator was following his "hunch" that the experimental group might verbalize the "things," relationships, and general principles emphasized in the manual even though they were not required to do so in the treatment. In two instances, the verbalization of "things" and the verbalization of relationships, the coding showed that the experimental group did do this significantly more than the control group. This suggests that the content of the manual that focused on logical organization probably had an effect on the experimental group's explanations.

Verbal Emphasis

Verbal emphasis refers to those teacher verbal behaviors that act to focus student attention on a subsequent or foregoing point, idea, fact, concept, principle, distinction, etc., which was important to the answer. This variable was drawn from the section of Lesson 4 in the "How to Explain" manual which discussed focusing attention on important points. The justification for this aspect of teacher verbal behavior was discussed in Chapter I. The coding manual for verbal emphasis was

TABLE XXII

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL CODINGS ON LOGICAL ORGANIZATION DIMENSION

Things		Mean Ratings by Three Judges			
Group	N	Topic A	Topic B	Topic C	Total
Experimental Group	6	.50	.67	.67	.61
Control Group	6	.17	.00	.00	.06
Total	12	.33	.33	.33	
F: Between Groups - 16.67**					
F: Between Topics - .00					
F: Groups X Topics- .67					
Relationship					
Experimental Group	6	.50	.33	.17	.33
Control Group	6	.17	.00	.00	.06
Total	12	.33	.17	.08	
F: Between Groups - 4.63*					
F: Between Topics - 1.30					
F: Groups X Topics- .19					
General Principle					
Experimental Group	6	.17	.17	.17	.17
Control Group	6	.00	.17	.00	.06
Total	12	.08	.17	.08	
F: Between Groups - 1.00					
F: Between Topics - .25					
F: Groups X Topics- .25					

* $p < .05$
** $p < .01$

derived from the work of Pinney (1969) previously discussed in Chapter I. The coding task was one of determining the frequency of verbal markers of importance (defined as words or phrases that indicated or

announced that a particular point or idea was important). If the manual had a significant effect on this variable, then the experimental group should exhibit a higher frequency of verbal markers of importance.

Table XX shows that there was high inter-rater agreement on the coding of this dimension. The analysis of variance results in Table XXIII show that the experimental group's mean score on verbal markers of importance differed significantly (at the .01 level) from the control group's mean score. There was also a significant difference between the topic means with explanations of Topic A containing fewer markers of importance than Topics B and C. The experimental group exhibited more instances of verbal emphasis than the control group on all topics. This indicates that the section in the manual that focused on the act of calling attention to important points while giving an explanation did have an effect on the experimental group's explanations. Presumably, the experimental group subjects were made more aware of the importance of emphasizing key points in their explanations.

Rule-Example-Rule

Rule-example-rule refers to a pattern which presents a structuring statement first, follows it with examples, and concludes with a structuring statement. The rule-example-rule pattern was discussed in Chapter I, and in Lesson 4 of the "How to Explain" manual. Rosenshine (1968), as previously mentioned in Chapter I, found that an example both preceded and followed by a structuring statement (rule) was positively correlated with effectiveness. In the coding of rule-example-rule, Rosenshine's procedures were followed closely. First, all examples on the transcripts were determined, then the presence

TABLE XXIII

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL CODINGS ON VERBAL EMPHASIS DIMENSION

Group	Mean Ratings by Three Judges Topic A	Topic B	Topic C	Total
Experimental Group	1.17	3.33	2.50	2.33
Control Group	.33	1.33	.83	.83
Total	.75	2.33	1.67	

F: Between Groups - 17.28**
F: Between Topics - 6.47**
F: Groups X Topics- .92

**p < .01

or absence of rules was determined. Coder's instructions were similar to Rosenshine's original instructions except for lesson material and examples of rule-example-rule statements. Frequencies of rules before and after examples, examples with rules before only, examples with rules after only, and total examples were determined by the coders. If the rule-example-rule section of the manual was effective, then the experimental subjects should exhibit a higher frequency than the control subjects.

Table XX shows the correlation coefficients for the rule-example-rule pattern. Table XXIV shows the results of the codings of the rule-example-rule pattern. The rules before and after examples, examples with rules before only, and examples with rules after only do not reach a level of significance which could justify rejection of the null hypotheses of equal means between the two groups. The means for the total number of examples do reject the null hypotheses at the .01 level, with the experimental group exhibiting more examples across topics than

TABLE XXIV

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL CODINGS ON RULE-EXAMPLE-RULE DIMENSION

Examples with Rules Before and After		Mean Ratings by Three Judges			
Group	N	Topic A	Topic B	Topic C	Total
Experimental Group	6	1.17	.33	.50	.67
Control Group	6	.50	.17	.50	.39
Total	12	.83	.25	.50	

F: Between Groups - 2.19
F: Between Topics - 3.25
F: Groups X Topics- 1.14

Examples with Rules Before Only					
Experimental Group	6	.33	.67	.50	.50
Control Group	6	.33	.33	.50	.39
Total	12	.33	.50	.50	

F: Between Groups - .32
F: Between Topics - .32
F: Groups X Topics- .32

Examples with Rule After Only					
Experimental Group	6	.00	.33	.00	.11
Control Group	6	.17	.00	.00	.05
Total	12	.08	.17	.00	

F: Between Groups - .38
F: Between Topics - 1.15
F: Groups X Topics- 2.70

TABLE XXIV (continued)

Total Examples with or Without Rules		Mean Ratings by Three Judges			
Group	N	Topic A	Topic B	Topic C	Total
Experimental Group	6	1.50	1.33	1.17	1.33
Control Group	6	1.00	.50	.83	.78
Total	12	1.25	.92	1.00	

F: Between Groups - 8.33**
F: Between Topics - 1.08
F: Groups X Topics- .58

** $p < .01$

the control group.

Among the variables of rules before and after examples, examples with rules before only, and examples with rules after only, the rules with examples before and after came the closest to approaching an acceptable level of significance.

In interpreting these data, it would seem that while the manual did not affect a striking difference between the two groups in the rule-example-rule pattern, it did stimulate significantly more total examples from the experimental group. Perhaps the fact that these explanations were extemporaneous reduced the probability that the explainers would be able to consciously insert rules and examples into their explanations in a systematic order. However, the focus on the rule-example-rule pattern in the manual seems to have stimulated a larger number of examples which could have the effect of improving the overall quality of an explanation.

Lesson Division

Lesson division attempted to focus on two sections of the "How to Explain" manual. The first section was Lesson 2 on Structuring. The Structuring lesson might influence the development of clear divisions in the explanations. The second section referred to Lesson 4 of the manual which discussed the summary of an explanation. Those subjects who were exposed to the manual should exhibit the tendency to summarize their explanations.

Shutes (1969), in a study discussed in Chapter I, explored the variable of lesson division, also using transcribed material. The coding manual used by Shutes was adapted to the present study. The coder's task was to mark where the introduction ended and summary began and to award two points when the division was clear and definite, one point when the division was vague, and zero when no clear division could be identified. Thus two visibility scores were obtained from this coding procedure: (a) the visibility score for the introduction, and (b) the visibility score for the summary.

As seen in Table XX, the reliability coefficients for the introduction and summary visibility scores were acceptable. Very few instances of an introduction were identified in either group. This is not surprising as the responses were to a question and one tends to begin answering a question immediately without a great deal of introductory comment. Also, the manual did not discuss the concept of introduction. The results for the summary, however, did justify rejecting the hypothesis that the means of the two groups were equal (Table XXV). The experimental group received significantly higher ratings for the

visibility of their summaries (at the .01 level). This indicates that the section in Lesson 4 of the manual which dealt with the summarizing of an explanation probably had an effect on the experimental group's tendency to use a summary in the explanations.

TABLE XXV

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL CODINGS ON LESSON DIVISION DIMENSION

Introduction -Visibility		Mean Ratings by Three Judges			
Group	N	Topic A	Topic B	Topic C	Total
Experimental Group	6	.50	.33	.33	.39
Control Group	6	.17	.33	.17	.22
Total	12	.33	.33	.25	
F: Between Groups -		1.05			
F: Between Topics -		.12			
F: Groups X Topics-		.35			
Summary-Visibility					
Experimental Group	6	1.50	1.50	1.33	1.44
Control Group	6	.17	.17	.83	.39
Total	12	.50	.58	.67	
F: Between Groups -		20.28**			
F: Between Topics -		.51			
F: Groups X Topics-		1.40			

** $p < .01$

Vagueness

The concept of vagueness was one aspect of the "How to Explain" manual. Vagueness, as previously discussed in Chapter I, has been found to be negatively correlated with student comprehension on lectures. Hiller (1969) developed a vagueness dictionary which used a computer to count the instances of vagueness in transcribed material. Vagueness

was defined as a style characterized by an excessive proportion of words characterized as presenting qualifications, or indicating haziness and ambiguity. (Appendix C contains a sample of the vagueness dictionary.)

The investigator contacted Hiller at Southern Illinois University to inquire about the vagueness dictionary and Hiller volunteered to run the 36 transcripts through his program. Thus, the transcripts were sent to Hiller for analysis. The data received from Hiller far exceeded initial expectations. Not only did he send the vagueness data but he also sent supplementary data on a related vagueness category (anaphoric references), plus word and sentence statistics.

Table XXVI summarizes the data received from Hiller. The vagueness ratio score was determined by counting all instances of vague words and dividing by the total number of words in each explanation. The vagueness ratio did discriminate between the experimental group and control group at the .01 level, with the control group having a significantly larger number of vague terms. There was also significant variance at the .01 level, between the topic means and significant variance due to the interaction between treatment and topic means. The topic and interaction means indicate that the difference in vagueness ratio is much smaller in Topic C, even though the mean ratio of vague words is still greater in the control group.

Another variable measured by Hiller's computer program was the anaphoric reference variable. Hiller believes that the use of anaphoric references (defined as pronouns which refer to a preceding word or group of words, such as other, they, those, them, him, her) may be

TABLE XXVI

ANALYSIS OF VARIANCE FOR MEANS OF EXPERIMENTAL AND CONTROL CODINGS ON VAGUENESS RATIO DIMENSION

Ratio of Vague Words to Total Number of Words	Mean Ratings by Three Judges			
Group	Topic A	Topic B	Topic C	Total
Experimental Group	.027	.022	.024	.024
Control Group	.055	.085	.034	.058
Total	.04	.05	.02	

F: Between Groups - 31.90**
F: Between Topics - 5.79**
F: Groups X Topics - 6.92**

Ratio of Anaphoric References to Total Number of Words				
Experimental Group	.030	.016	.019	.021
Control Group	.051	.026	.048	.041
Total	.040	.021	.034	

F: Between Groups - 7.72**
F: Between Topics - 2.58
F: Groups X Topics - .60

Total Words Per Explanation				
Experimental Group	163.17	154.00	137.00	151.93
Control Group	113.83	111.17	100.17	108.39
Total	138.50	132.58	118.58	

F: Between Groups - 21.50**
F: Between Topics - 1.62
F: Groups X Topics - .15

** $p < .01$

TABLE XXVI (continued)

Total Sentences Per Explanation				
Group	Topic A	Topic B	Topic C	Total
Experimental Group	8.00	7.33	7.83	7.72
Control Group	4.17	5.67	4.33	4.72
Total	6.08	6.50	6.08	

F: Between Groups - 30.50**
F: Between Topics - .26
F: Groups X Topics - 1.54

** $p < .01$

confusing for the listener. It was measured by counting the number of anaphoric references and dividing by the total number of words in each explanation. The anaphoric reference variable discriminated between the two groups at the .01 level, with the control group exhibiting more instances of the behavior. The vagueness ratio and the anaphoric reference ratio were not, however, found to be correlated ($r = .09$).

Two other variables of interest were provided by Hiller. These were total number of words and total number of sentences. Both of these variables discriminated at the .01 level between the two groups, with the experimental group using significantly more words and sentences than the control group.

The vagueness and anaphoric reference results indicate that the manual probably had the effect of reducing the number of vague words used by the experimental group. The word and sentence statistics seem to indicate that the manual, by focusing on the explaining act and offering suggestions for improving explanations, tended to make the explainer use a larger number of words and sentences than he would have normally.

Overall Quality Correlates

Since student raters had, in the original ratings, rated each subject on overall quality, it was felt that it would be informative to investigate the correlation between the students overall quality ratings and content analysis ratings for the six experimental and six control subjects. The results were not positive. There was no strong correlation between overall quality and the 15 dimensions investigated in the content analysis (Table 27). There were slight trends in the dimensions of examples with or without rules, vagueness ratio, and anaphoric references, however these were very slight. The general conclusion is that there was no real positive correlation between the students ratings of overall quality and the content analysis ratings for these 12 subjects.

Summary

The results of the coding and rating of a random sample of experimental and control explanations were reported in this chapter. In general these results indicate that the manual had an effect on the experimental group's explanations. They do not imply that the manual alone was the reason for the significant differences between the two groups, as reported in Chapter III. Rather it was probably the manual and the practice program to which it was attached that led to the differences. A portion of the difference can be attributed to the extensive practice that the experimental group experienced. The results reported in this chapter do support the hypothesis that the total treatment did have an effect on the experimental group and that the manual and its associated practice sessions show promise of

TABLE XXVII

CORRELATIONS BETWEEN RATINGS OF OVERALL QUALITY AND FIFTEEN DIMENSIONS OF CONTENT ANALYSIS IN EXPLANATIONS ON THREE TOPICS

Group	N	Topic 1	Topic 2	Topic 3
Overall Quality and Content Validity Dimension				
Experimental Group	6	-.39	.44	.64
Control Group	6	.46	-.57	-.04
Total	12	.26	-.05	.27
Overall Quality and "Things" Dimension				
Experimental Group	6	-.82	.32	.64
Control Group	6	-.17	.00	.00
Total	12	-.34	.30	-.17
Overall Quality and Relationship Dimension				
Experimental Group	6	-.39	.45	.01
Control Group	6	-.17	.00	.00
Total	12	-.18	.32	.04
Overall Quality and Genetal Principle Dimension				
Experimental Group	6	-.25	.35	-.07
Control Group	6	.00	.54	.00
Total	12	-.05	.44	-.03
Overall Quality and Verbal Emphasis Dimension				
Experimental Group	6	-.73	.17	-.36
Control Group	6	-.79	.09	.11
Total	12	-.52	.25	-.07
Overall Quality and Examples with Rules Before and After Dimension				
Experimental Group	6	.12	.82	.43
Control Group	6	.91	.48	-.59
Total Group	12	.50	.60	-.04
Overall Quality and Examples with Rule Before Only Dimension				
Experimental Group	6	-.43	-.77	.32
Control Group	6	-.05	.01	.21
Total	12	-.20	-.23	.25

TABLE XXVII (continued)

Group	N	Topic 1	Topic 2	Topic 3
Overall Quality and Examples with Rule After Only Dimension				
Experimental Group	6	.00	.56	.00
Control Group	6	-.17	.00	.00
Total	12	-.18	.36	.00
Overall Quality and Examples With or Without Rules Dimension				
Experimental Group	6	-.27	.35	.81
Control Group	6	.70	.29	-.05
Total	12	.36	.39	.31
Overall Quality and Introduction Visibility Dimension				
Experimental Group	6	-.57	.33	.65
Control Group	6	-.17	-.80	.28
Total	12	-.24	-.35	.49
Overall Quality and Summary Visibility Dimension				
Experimental Group	6	-.26	.27	.61
Control Group	6	-.28	-.38	-.20
Total	12	-.07	.17	.20
Overall Quality and Vagueness Ratio Dimension				
Experimental Group	6	.68	-.32	.40
Control Group	6	-.56	.27	.47
Total	12	.10	.14	.37
Overall Quality and Anaphoric Reference Dimension				
Experimental Group	6	.14	-.45	.76
Control Group	6	.10	.80	.85
Total	12	.18	.34	.61
Overall Quality and Total Word Dimension				
Experimental Group	6	.24	-.83	-.30
Control Group	6	.40	.63	.36
Total	12	.19	-.02	.09
Overall Quality and Total Sentence Dimension				
Experimental Group	6	-.42	.33	-.07
Control Group	6	-.39	-.22	.31
Total	12	-.41	-.16	.12

being useful in helping teachers to develop more effective explanations. In the final chapter, ideas for further research on this question and ways of improving the treatment are considered.

CHAPTER V

QUESTIONNAIRE RESPONSES

The main focus of this study has been on determining whether the experimental group's explanations differed significantly, on four rated dimensions, from those of the control group, and whether the groups also differed on specific dimensions of explaining behavior stressed in the training manual. Another question that should be explored is whether the experimental group liked the training and whether there was anything about it that they felt could be improved. If these subjects had serious reservations about the training, then there could be a real question about its value even though there was an improvement. If the subjects felt that parts of the training were weak, those parts could receive very sharp scrutiny in making adjustments for the future.

Subjects' reactions to the training can be gauged from their responses to a series of questionnaires administered during the training. To encourage an honest evaluation, students were asked to reply anonymously to the questionnaires. Eleven questionnaires were completed, one for each of the five written lessons in the "How to Explain" manual, one for each of the five practice sessions, and one final, comprehensive questionnaire. The questionnaires contained both fixed and free response questions. This format gave the subjects the opportunity to respond in both a structured and an unstructured manner, so as to provide a variety of information about each lesson.

This chapter will summarize the responses to the various questionnaires and the conclusions derived from analysis of these responses.

Appendix E contains the 11 questionnaires and the responses to both the objective and subjective sections.

Lesson Questionnaires

The lesson questionnaires from the subjects on each lesson in the "How to Explain" manual were obtained. Subjects were asked a series of questions to which they responded by checking the answers that they felt were most appropriate. In addition, subjects were asked to respond to three open-ended questions. Basically these open-ended questions asked if there was anything that the subjects particularly liked or disliked and called for other comments about any aspects of the training they had just completed. The fixed response questions in each questionnaire are presented in Appendix E along with the percentage of the 30 subjects who checked each possible answer. The open-ended questions of each questionnaire are presented in Appendix E along with the responses made by the subjects.

The remainder of this section will review the major points made in the responses to each questionnaire. Detailed discussion of specific conclusions will be left to the final section of this chapter in order to draw together the results of all the questionnaires. The questionnaires on the lessons of the "How to Explain" manual are presented in the order that they were given.

Lesson 1. The responses to the questionnaire for Lesson 1, were generally positive. Most of the 30 subjects felt that this lesson helped them appreciate listening skills (97%), improve their performance as a teacher (73%), organize spoken statements better (63%), and improve listening skills (87%). The subjects felt that the level of the lesson

was suitable (63%), that they learned more than (53%) or the same as (43%) they would have learned from a teacher in the same amount of time, and that the exercises were suitable (70%). Their comments suggested that they liked the clarity, organization, and practical aspects of the lesson. The main problem in Lesson 1 appeared to be the exercise of listening to a radio or TV talk show. Some subjects felt that it was difficult to find an appropriate talk show. Perhaps this approach could be offered in the form of a suggestion, rather than an exercise.

Lesson 2. The responses to the questionnaire for Lesson 2, while again generally positive, contained the first real substantial criticism of the program. Most subjects felt that the lesson helped them appreciate the importance of structuring (90%), would improve their performance (83%), would make their organization of spoken statements more effective (53%), and would improve their skill in identifying "things" (80%), relationships (83%), and principles (73%). Most felt that the teaching level was suitable (63%), that they learned more than (47%) or the same as (33%) they could have from a teacher in the same amount of time, and that the exercises were suitable (60%). In the subjective section of the questionnaire, it appears that the section of this lesson on the identification of the general principle was not adequate. A large number of comments referred specifically to confusion about what a general principle was and how it could be used. The replies to the open-ended questions brought into focus a problem that needs to be corrected in the future development of the manual. The subjects felt that the concept of a general principle was useful,

but was not adequately explained.

Lesson 3. In the responses to the questionnaire on Lesson 3, the subjects were again positive. Most felt they better appreciated the importance of application (97%), validity (77%), simplicity (80%), and clarity (80%). They also felt that this lesson would improve their performance (77%), make the organization of their spoken sentences more effective (73%), and improve their skill in application (80%), and in seeking validity (73%), simplicity (87%), and clarity (87%). They felt the lesson was suitable (73%), that they learned more than (30%) or the same as (53%) they could have from a teacher in the same amount of time, and that the exercises were suitable (80%). The replies to the open-ended questions indicate that more examples of appreciation, validity, simplicity, and clarity would be useful. The concept of a general principle is mentioned once more with some subjects reporting their lack of understanding of this aspect inhibiting their development.

Lesson 4. The responses to the questionnaire on Lesson 4 indicate that the subjects felt the lesson helped them to better appreciate the importance of focue (97%), rule-example-rule (90%), avoiding vagueness (87%), and summarizing (87%). They also felt that the lesson would improve their performance (80%), make the organization of their spoken statements more effective (67%), improve their skills in developing focus (87%), rule-example-rule (77%), summarizing (83%), and increase their ability to avoid vagueness (77%). The subjects felt that the teaching level of the lesson was suitable (87%), that they learned more than (50%) or the same as (37%) they could have from a teacher in the same amount of time, and that the exercises were

suitable (77%). In the open-ended responses, the major concern that appeared is that the rule-example-rule pattern could be better explained. Apparently, the explanation of rule-example-rule in the manual needs revision and clarification. Perhaps some exercises which would focus on practicing this pattern could be added.

Lesson 5. The responses to the questionnaire on Lesson 5 were also very positive. The subjects felt that they could better develop a complete explanation after this lesson (83%), that this would help improve their performance as a teacher (67%), that their organization of a complete explanation would be more effective (80%), and that the lesson improved their skill in developing a complete explanation (83%). The teaching level of this lesson was seen as suitable (90%), the subjects felt they learned more than (50%) or the same as (30%) they could have from a teacher in the same amount of time, and the exercises were seen as suitable (87%). The general response to Lesson 5 was very favorable. It appears that the strong positive response is related to the fact that this lesson ties all of the previous lessons together and provides a unified summary. The negative responses that appear refer to the questions in the exercises. Perhaps by the final lesson it would be wise to eliminate the written exercises and rely on the practice session for the practical application.

Practice Session

The questionnaires on the practice sessions attempted to obtain information about the subjects' feelings toward each practice session. The responses to these questionnaires will be discussed in the same format as that used in the previous section. The responses will be summarized and the results for each questionnaire briefly discussed.

The more detailed interpretation of specific conclusions from all of the questionnaires will be left until the final section of this chapter.

Practice Session 1. The responses to the objective section of the questionnaire on Practice Session 1 were quite positive. The subjects felt that they now better appreciated the importance of listening skills (100%), that this would improve their performance as a teacher (93%), that their organization of spoken statements would be more effective (60%), and that their listening skills had improved (100%). They felt that the teaching level of the course was suitable (73%), that listening to all of the statements was useful (70%), and that they were better able to summarize remarks after completing the session (97%). In response to the audio-programmed mode of instruction, most felt that they had learned more than (70%) or the same as (27%) they would have learned from a teacher in the same amount of time, and that they like this type of instruction more than the regular classroom method (67%). However, only 40% of the subjects felt that they could adequately summarize spoken remarks as the speakers proceeded, while 60% felt they could not. The responses to the open-ended questions indicate why the subjects felt they were not better at summarizing as the speakers proceeded. Subjects felt, in general, that this program was too long and drawn out, and that they probably did not derive the most benefit from the later speakers. It might be desirable to shorten the program or leave time for a break in the middle.

Practice Session 2. Responses to the questionnaire for Practice Session 2 were again positive. Most of the subjects felt the session

improved their performance of the skill involved (93%), that the instructions were adequate (97%), that the tape recorder was useful (90%), and that it was helpful to work with a partner (100%). Most felt that the practice session was suitable (77%), liked the practice session method more than the regular classroom method (90%), and that the questions asked were suitable (80%). The open-ended responses were very positive. The use of a partner, tape recorder, and critique session appeared to be very successful. Again, since this practice session related directly to Lesson 2, the problem of not completely understanding the concept of a general principle surfaced. The discussion of general principles appears to be a segment of the program that definitely needs revision and clarification.

Practice Session 3. Practice Session 3 responses continue the positive evaluation of the practice session. The subjects felt that their performance of the skills involved improved (93%), the instructions were adequate (100%), the tape recorder was useful (83%), and their partner was helpful (100%). They felt the level of the session was suitable (83%), they liked the practice session method more than the regular classroom method (90%), and they felt that the questions used were suitable (77%). Comments about the practice session were very favorable with the use of the partner, tape recorder, and critique session being singled out. Again comments were inserted about the need for the general principle concept to be clarified.

Practice Session 4. Subjects indicated that in Practice Session 4 their performance of the skill involved improved (90%), the instructions were adequate (97%), the tape recorder was useful (83%),

and their partner was helpful (100%). The level of the session was suitable (80%), the reteach was considered useful (80%), and the questions used suitable (90%). In the comments, the reteach and critique opportunities were singled out as very useful. The main problem appears to be a lack of time. This indicates that the amount of material in the session could be reduced or the time period extended.

Practice Session 5. The subjects felt that the final practice session improved their performance in developing a complete explanation (97%), and had adequate instructions (100%), that the tape recorder was useful (70%), and that their partner was helpful (100%). They also felt that the level of the practice session was suitable (90%), the reteach was useful (73%), and the questions used were suitable (83%). The comments indicated, again, that the partner, tape recorder, and critique sessions were generally well received and that the general program was perceived as being useful and interesting.

Final Questionnaire

The final questionnaire was intended to get an overall picture of how the subjects felt about the total "How to Explain" program. This included both the manual (5 lessons) and the practice sessions (5 practice sessions). The responses to this questionnaire will be discussed in the same manner as the previous sections with the highlights being briefly discussed. The detailed interpretation will follow this section and draw together all of the questionnaires.

Final Questionnaire. In general the subjects felt they learned more than they would have from a teacher in the same amount of time (70%), and that the program would improve their performance as a teacher (90%). The subjects felt the teaching level of the program was suitable (80%), and that the organization of their spoken statements would be more effective (80%). They felt the manual was helpful (63%), and either somewhat interesting (47%) or interesting (37%). The subjects liked the practice session method of teaching more than the regular classroom method (73%), felt the level of the practice sessions was suitable (87%), that the practice sessions improved their performance of the skills involved (93%), that the tape recorder was useful (87%), the instructions for the sessions were adequate (100%), and that their partner was helpful (97%). The subjects indicated that they were basically comfortable (60%) in the practice sessions, felt that the sessions were useful (63%) or very useful (27%), and that the questions used were suitable (87%). The subjects felt the training period was generally just right (53%), giving this activity a rating of good (73%), and felt that it was generally interesting (somewhat interesting 37%, quite interesting 43%, and very interesting 17%). In the responses to the open-ended questions a variety of problem were mentioned. One comment that could be considered in improving the program is the possibility of practicing with more than one person. It would be possible to get the group together to discuss and compare divergent answers. On the positive side, the subjects appeared to like the general organization and focus of the training process and felt they got something out of the

manual, working with a partner, and critiquing answers.

Interpretation

The responses to the 11 questionnaires have been presented and the highlights briefly discussed. It is now possible to interpret the more important and useful results and comments. In order to follow a logical pattern this section will discuss the results as they relate to (a) the "How to Explain" manual, and (b) the practice sessions, and (c) the final questionnaire.

"How to Explain" Manual. In general, the manual appeared to elicit very positive responses. Nearly all the questionnaires support the inference that the subjects considered the lessons of the manual to provide useful learning experiences. However, there were definitly some specifics that could be improved, and this is where the greatest benefit is derived from the questionnaires.

From all of the suggestions, it appears that the section on the general principle (Lesson 2) needs the most revision. There was a great deal of confusion about what the general principle was and how it could be used. This confusion, when carried over to subsequent lessons, made many of the subjects feel that they were not getting as much as they should out of the manual and practice sessions. There is no doubt that the general principle section needs to be expanded and reworded in any future revision of the manual. Exercises should be added to give the subjects practice in developing the general principle. In addition, the practice session that concentrates on Lesson 2 (Practice Session 2) should be revised so as to concentrate more on the development of the general principle. In this way the

partners could help each other work on and better understand this aspect of the program.

Another major concern that appears in the comments is that the rule-example-rule pattern could be better developed. The lesson in the manual (Lesson 4) appeared to leave some confusion as to what the rule-example-rule pattern was and how it could best be used. It appears that this section of Lesson 4 could be written so that it gives a clearer picture of what the rule-example-rule pattern is and also gives some concentrated practice in the exercises.

Also, there was an expressed desire to have less written work in the manual. The subjects seemed to feel that the written work was not as useful as the practice sessions. A good suggestion was that the written exercises be given a time limit. In a future revision of the manual it probably would be more useful to reduce the written exercises and limit the time spent on them. The exceptions to this would be those areas that definitely need more practice, i.e., the general principle and rule-example-rule.

The manual in general was well received. With a few exceptions it appears that the format should remain very much as it is. The positive statements indicated that the basic format was successful.

Practice Sessions. The practice sessions were, like the "How to Explain" manual lessons, generally regarded in a positive light. However, there were some suggestions that should be taken into account which would make the practice session experience even more positive.

In the first place, Practice Session 1 was definitely too long. While the subjects felt that the session was worthwhile, they also

felt that it was too long and drawn out. This could be remedied by omitting some of the items to shorten the listening program or establishing a five to ten minute break halfway through the program.

Again, as in the manual, the general principle caused problems. The fact that the general principle was not clear in the manual caused the subjects to have problems in the practice session. The root of this problem was, of course, in the manual, and most of the problem could be cleared up by reworking this section of the manual. However, Practice Session 2 could have additional exercises written into it which would focus on the general principle and force the partners to work out any problems they might have.

Practice Session 4 had a special problem in that there apparently was not enough time to effectively complete the session. The amount of activities that are required in this session could be reduced to solve this problem.

In the more general sphere, there were some comments about not having the opportunity to share practice session experiences with the entire group or at least with a number of different people. While the partner concept was supported very strongly, there was still a desire to have a session or two with a larger group. This could easily be accomplished by having all or parts of two or three sessions built around larger groups. Also a suggestion that the subjects be allowed to ask some original questions that were of real interest to them could easily be incorporated into the practice sessions.

With the exceptions discussed above, the practice sessions were well received. Singled out quite often for praise were the tape

recorders, partners, critique sessions, general instructions, and overall organization and focus of the sessions.

Final Questionnaire. The responses to the final questionnaire were very positive. Both the positive and negative comments mirror the results of the lesson and practice session questionnaires. The major concerns about general principle, rule-example-rule, time, and working with larger groups were repeated. Also, as in the other questionnaires, there were individual concerns which really characterized only one or two subjects, e.g., fear of tape recorders. These individual concerns should be dealt with on an individual basis. This emphasizes the importance of allowing for flexibility in the training program so that various individual problems can be dealt with. The main emphasis of this chapter was to focus on those concerns that indicated there was a real problem. To this end, the questionnaires were successful in revealing shortcomings which should be rectified in the future development of the "How to Explain" program.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The objectives of this chapter are to summarize the purpose, procedures, results, and conclusions of the study and discuss the implications of the study for teacher training and future research.

Purpose and Procedures

The purpose of this study was to develop and evaluate a manual for the improvement of teacher effectiveness in explaining. The manual was designed to help the teacher understand the major aspects of good explanations and to give him practice in improving those aspects. The manual itself was divided into two main sections. The first section, consisting of the first two lessons, focused on the logical organization and selection of content. The second section, consisting of the last three lessons, focused on application or the actual giving of the explanation.

The training manual was investigated in this study through an experiment in a pre-service teacher training program. A class of 60 beginning teacher trainees was randomly divided into two groups. All subjects completed a pretest which consisted of answering orally and extemporaneously three questions asked by an experimenter. All questions and answers were tape recorded. After the pretest, one half of the class, the experimental group, received the "How to Explain" manual as the basis for training. This group did the five lessons in the manual on successive days in five one-hour practice sessions. Each lesson with its written exercises was handed out on the day before the

practice session. Each practice session called for the subjects to have read the lesson in advance and to have completed the exercises in the assigned material for that session. The other half of the class, the control group, was not given the training manual. Instead they were given a list of stimulus questions and told to think about how they would respond to questions such as these. The control group followed these instructions during the time the experimental group was in the practice sessions. All subjects, after training, completed a posttest which required their answering three different questions orally and extemporaneously.

After the collection of the pretest and posttest data, each subject's answers to both the pretest and posttest stimulus questions were transferred to another tape in random order. The six answers for each subject were then played in the random order to ten 7th and 8th grade student raters. The student raters, using a rating sheet, then rated each answer on four dimensions: (a) organization, (b) clarity, (c) quality, and (d) rank among the six answers for that subject. Any one rater rated only one subject; therefore 600 student raters were used (10 raters per subject and 60 subjects). The organization, clarity, and quality dimensions were rated on a five-point scale, with 5 representing Excellent to 1 representing Very Poor. The rankings were made after the other three dimensions were rated. The ranks were from 1 to 6 with 6 being the best and 1 being the worst answer for that subject.

After the rating of the stimulus questions was completed, six experimental and six control subjects were randomly selected. The

three posttest answers of the twelve subjects were transcribed. The result was 36 transcribed explanations (12 subjects with 3 posttest explanations each subject). These 36 posttest explanations were then coded by three coders using prepared coding manuals on six dimensions which had been stressed in the "How to Explain" manual: (a) content validity, (b) logical structure, (c) verbal emphasis, (d) rule-example-rule, (e) lesson divisions, and (f) vagueness. If it were possible to relate the content of the sample explanations to these six dimensions, and if performance on these dimensions was better in the explanations of the experimental group, then there would be some basis for concluding that the manual -- rather than more practice -- played a role in making the experimental group's explanations better than those of the control group.

In an attempt to find out how the experimental subjects felt about the training, the investigator administered 11 questionnaires to the subjects under anonymous conditions as they progressed through the program. These questionnaires proved useful in obtaining some personal evaluation of the entire program.

Results and Conclusions

The results of the analysis of variance of the posttest means for the experimental and control groups showed the ratings of the experimental group to be significantly more favorable at the .01 level on all four dimensions. It was also noted that the ratings on organization, clarity, and quality were highly correlated (r_s = about .90). This finding indicates that the three separate ratings may properly be regarded as ratings of one general dimension.

These results suggest that the training procedure was effective in helping the experimental subjects improve their effectiveness in explaining.

Content Analysis Data. The first dimension investigated was content validity, or the rating of the degree to which the explanation was true, correct, and accurate. The difference between the two groups was significant ($p < .01$) with the experimental group exhibiting the higher mean rating. This suggests that the section of the "How to Explain" manual that was concerned with validity did have an effect. The experimental group subjects presumably were made more aware that the accuracy and truth of the explanation was important and were more successful in making their explanations as complete and valid as possible.

The second dimension was logical organization or the organization of the explanation in terms of the identification of "things," a relationship, and a general principle. Although the experimental subjects were not specifically instructed to verbalize the things, relationship, and general principle, it was felt that their explanations would have a high probability of containing such statements because of the focus on these matters in the manual. In two of these aspects, the verbalization of "things" and relationship, the coding showed that the experimental group did have a significantly higher frequency ($p < .01$ and $p < .05$, respectively) than the control group. This result suggests that the content of the manual that focused on logical organization had an effect on the experimental group's explanations.

The third dimension, verbal emphasis, referred to those teacher verbal behaviors that are intended to focus student attention on a subsequent or foregoing point, idea, fact, concept, principle, distinction, etc., which was important to the answer. The results showed that the experimental group exhibited significantly ($p < .01$) more verbal emphasis than the control group. This finding indicates that the section in the manual that focused on the act of calling attention to important points while giving an explanation did affect the experiment group's explanations. Presumably the experimental subjects were made more aware of the importance of emphasizing key points in their explanations.

The fourth dimension, rule-example-rule, referred to a pattern in which a structuring statement is presented first, examples follow, and a structuring statement is then presented. Frequencies of rules before and after examples, examples with rules before only, examples with rules after only, and examples with or without rules were determined by the coders. The frequencies of examples with rules before and after, examples with rules before only, and examples with rules after only were not significantly different in the experimental and control groups. However, the mean frequencies for the total number of examples with or without rules were significantly ($p < .01$) greater for the experimental group than the control group. It seems that while the manual did not effect striking differences between the two groups in the rule-example-rule pattern, it did stimulate significantly more examples with or without rules in the experimental group, and this result could have the effect of improving the overall quality of an explanation.

The fifth dimension, lesson divisions, referred to the occurrence of clear divisions and a summary in the explanations. Two visibility scores were obtained from this scoring procedure: (a) the visibility score for the introduction, and (b) the visibility score for the summary. Very few instances of an introduction were identified in either group, and there was no difference between the groups. On the summary visibility dimension, the experimental group obtained significantly higher ratings ($p < .01$). This indicates that the manual had an effect on the experimental group's tendency to use a summary in their explanations.

The sixth dimension, vagueness, was defined as a style characterized as presenting qualifications, or indicating haziness and ambiguity. Examples are "more or less," "some," and "might." The categories in the vagueness dimension were coded by a computer using a vagueness dictionary developed by Hiller (1969). A vagueness ratio was determined by counting all instances of vague words and dividing the total count by the total number of words in each explanation. The vagueness ratio did discriminate between the two groups at the .01 level, with the control group using a significantly larger proportion of vague words. Another category, anaphoric references, (defined as pronouns which refer to a preceding word or group of words, such as other, they, those, them, him, her) may also be confusing for the listener. The anaphoric reference variable discriminates between the two groups at the .01 level, with the control group exhibiting more instances of such behavior. The results for vagueness and anaphoric references indicate that the manual probably had the effect of reducing these kinds of verbal behavior on

the part of the experimental group.

Two other variables of interest provided by the computer were total number of words and total number of sentences. Both of these variables discriminated between the two groups at the .01 level, with the experimental group using more words and sentences than the control group. The word and sentence statistics seem to indicate that the manual, by focusing on the explaining act and offering suggestions for improving explanations, tended to make the explainer use a larger number of words and sentences than he would have normally.

Questionnaire Responses. Eleven questionnaires were anonymously completed by the experimental subjects as they progressed through the training in order to ascertain their opinions and feelings about the training. In general, the responses to the lessons in the manual and the practice sessions were positive. However, the questionnaires did prove to be valuable in identifying some areas that could be improved. The major improvement needed appears to be in the definition and explanation of a "general principle" (Lesson 2 in the "How to Explain" manual). There was a great deal of confusion about what the general principle was and how it could be used. This confusion carried over, for many subjects, to subsequent lessons and practice sessions, causing them to feel that they were not getting as much as they should out of the manual and practice sessions. It is clear that exercises should be added that concentrate on giving the subjects practice in developing the general principle. If sections of the practice session were revised so as to concentrate on the nature of the general principle, then the partners could help each other better understand this aspect of

explaining.

Another major concern, brought to light by the questionnaires, was the development of the rule-example-rule pattern. The subjects felt confused about what the rule-example-rule pattern was and how it could best be used. In addition there were some suggestions that the amount of written work should be reduced and that time to work in larger groups should be provided.

The questionnaires seemed to be somewhat successful in revealing some problems which should be met in any future development of the "How to Explain" program.

Summary. The results of the rating of the pre- and posttest answers, the coding of the random sample of experimental and control explanations, and the responses to the questionnaires, indicate that the manual probably had an effect on the experimental group's explanations. This does not suggest that the manual alone was the reason for the significant differences reported between the two groups. Rather it was the manual and the practice program to which it was attached that led to the differences. The results do support the hypothesis that the total treatment has an effect. The manual and its associated practice sessions show promise of being useful in helping teachers to develop more effective explanations.

Implications for Teacher Training

While no part of the present study may be said to give "definitive" answers to problems in the development of teachers, it suggests some positive practices. The "How to Explain" manual, itself, suggests a format that appears to be successful and well received. This format

is one of taking certain implications or findings of educational research and translating them into easily understood terms. In the present study, the aspect of teaching was that of explanation; however, many other aspects of teaching, such as questioning, lecturing, discussion, and group work, could be treated in a similar manner. Also, the idea of practicing the aspect of teaching under consideration, immediately after reading about it, appears to be successful and well received. It seems that this practice could be easily incorporated into the present-day curriculum if teachers are willing to reevaluate the function of class periods. Clearly, reading material can be handed out at the end of one class period so that the lessons in that material can be practiced during the next class period. Another practice in the study that was well received was that of working with a partner. The arrangement whereby each person was able to interact with another person on an equal level was highly praised. The subjects felt that the use of a partner was an effective way to get them really involved in the activity at hand. Also the use of the tape recorder was singled out as extremely useful. It is interesting to note that the tape recorder was not used simply to listen to something, but was used as a device for self-criticism. This might suggest that some audio-visual equipment had much more use than that of simply transmitting knowledge. Perhaps teacher trainers need to look at some alternative uses for audio-visual equipment in order to use such equipment to its full value.

Another important point is that the focus of the study, that of improving explanations, was a practicel focus. This was something that the teachers could use in their teaching and therefore was identified as

worth learning. Since it appears that a novice teacher is keenly interested in those aspects of his training that appear to have practical utility, teacher educators would be well advised to develop the practice aspects of teacher training.

Implications for Future Research

The research project, like most projects, leaves a number of interesting questions unanswered. One could easily build a case for the replication of this investigation in order to establish the consistency of the findings. But, this investigator feels that more useful research would not merely test the findings of the present study but would also open new horizons, i.e., study different aspects of teaching (questioning, discussion methods, group work) using a similar format. The question of the persistence of the improvement in the experimental group could be investigated. From the present study one can say only that the experimental subjects exhibited significant improvement immediately after the training. Relevant future research could determine whether the experimental subjects were significantly better a month and a year or more after completing the training.

The analysis of teachers' explanations in the real classroom situation would provide useful information. Such a study would compare actual classroom explanations of teachers who had participated in the "How to Explain" program with those of teachers who had not. This comparison would give information about the transfer value of the training program for explaining in the classroom. Not only should effects on real classroom teacher explanations be investigated, but

also effects on student understanding or achievement as an outcome of teacher explaining.

An area of research which has been developing rapidly and could have great influence on studies such as this is psycholinguistics. The basic purpose of psycholinguistics seems to be the description of the psychological processes that go on when people use words and sentences. These processes include those of hearing, matching, accepting, interpreting, understanding, and believing an utterance. Psycholinguistic processes are defined not only in terms of the listener but also in terms of the speaker. One problem that psycholinguists face is that of whether speaking and listening are two separate abilities, similar but distinct, or manifestations of a single ability. The application of psycholinguistic research to the present study could provide information about the relationship of the explainer to the explainee and the effect of linguistic patterns on understanding.

Investigation into different ways of presenting the "How to Explain" manual could prove profitable. Presently the manual is associated with extensive and somewhat complicated practice sessions. It is possible that teachers could still improve explanations if the manual was associated with simpler means of practice. Perhaps the manual could have built into it individual practice programs which would be as good as the present two-person practice sessions.

In the long run, the success of this study will be determined by whether it stimulates useful ideas for further research and also provokes empirical tests of those ideas.

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APPENDIX A

"HOW TO EXPLAIN MANUAL"

HOW TO EXPLAIN

"I never realized how difficult it was to explain a simple concept." "You forget how difficult it is to make sure every student understands." "I thought I was explaining it clearly, but I was wrong!" These are just a few representative statements from teachers who had just tried to explain a phenomenon (Why it is colder in winter than in summer.) to a class. The responses from their classes showed the teachers that they often set up unnecessary stumbling blocks to understanding.

Yet teachers are called upon every day to explain things to their students. Usually these explanations are extemporaneous. A student suddenly thinks of a question and asks the teacher. The quality of the teacher's explanation is important. The teacher wants the student to get a

clear, not a cloudy, understanding of what he has asked about.

This manual is designed to help you make your explanations more understandable. Important skills are discussed in each of its five lessons. Each lesson has exercises to let you practice what you have learned. It also has questions designed to encourage you to use all of the skills discussed.

The total "How to Explain" program has two parts. Reading this manual is one part. Practice sessions after each lesson are the second part. You will read each day's lesson, and preceding lessons, before the classroom practice sessions, for each of the five days of the course. In the classroom practice sessions you will work with a partner, using a tape recorder as an aid, in order to practice and criticize the skills just studied.

THE MANUAL

The lessons in this manual will take you through a series of steps that will improve your explanations. Each lesson contains helpful information, examples, and exercises. Each lesson covers only a portion of the total systematic approach to explaining. Each lesson builds on the preceding lessons. The final lesson gives you the opportunity to put all of the skills together and practice them as a unit. Here is an outline of the five lessons and the main topics included in each:

Outline of Lessons and Topics

A. Logical organization and selection of appropriate content.

Lesson 1 1. How to listen to questions.

Lesson 2
2. How to pick out the main "things" in the question.
3. How to determine the relationship between these things.
4. How to determine the general principle involved.

B. Application

Lesson 3
1. How to apply the principle to the relationship.
2. How to make the explanation valid.
3. How to make the explanation clear.
4. How to make the explanation simple.

Lesson 4
5. How to focus attention on important points.
6. How to use the rule-example-rule pattern.
7. How to avoid vague words.
8. How to summarize.

Lesson 5
9. How to put the entire explaining act together and practice it as a whole.

This manual has been developed to help you, as a teacher, to improve your explaining behavior. The five lessons in the manual will help you to understand the major components of good explanations and give you practice in improving these components and the whole act of explaining.

1 LISTENING

A good explanation must have a logical organization. It must also have appropriate content. Both the organization and the content must be related to the question that calls forth the explanation. This lesson deals with the first step in the development of an explanation:

Listen to the question carefully.

If you are going to explain something, you must know what the question was in the first place. Unless you concentrate completely on the question, you may miss something or misunderstand the question. It is of extreme importance to listen, and listen carefully. Look at the student, concentrate on what he is saying, and take in every word.

An example of a good listener is the announcer on a radio show where people phone in

questions. He attempts an answer only after he is positive he understands the question. He uses many techniques to improve his understanding:

- He may ask the caller to repeat the question.
- He may repeat the question back to the caller.
- He may repeat the main point of the question back to the caller and ask if that is right.
- He may rephrase the question and ask if that is right.

In short, he is listening to the question carefully in an attempt to understand it fully.

While you are listening to a question, you should remember that some things are being assumed by the student in every question. This manual basically deals with the cases where the assumptions of the question are adequate, therefore you are free to supply what the question asks for. Yet, you can, and often should, question the question. For example, in the question, "Why is it that man cannot travel faster than the speed of light?", you may wish to, and should, question the students basic

assumption. Yet once you and the student agree upon the assumptions in the question, you would then answer the revised question.

EXERCISES

Here are some exercises to do tonight to begin to sharpen up your listening ability and prepare for tomorrow's practice session.

1. Turn on your radio to a radio talk show. Listen to how the announcer handles questions that are directed to him. Try to identify the different techniques used by the announcer to make sure that he understands the question completely.

2. While listening to the radio or television talk show, try to concentrate on a question that is being asked. As soon as the person finishes the question, turn the volume down. Then see if you feel you understand the question and if you heard the main points. Do this at least ten times.

3. Have your husband, wife, roommate, or anybody nearby help you on this next exercise. Have this person ask you the questions that follow, one at a time. Look at the person, concentrate on what he is saying, listen carefully. If you feel that what he is asking is clear to you, go on to the next question. If not, try some of the techniques that the talk show announcer might have used. At this point you don't need to be able to answer these questions. Just listen and understand.

a. Why is a compass so useful?
b. Why is freedom so important?
c. How is tax money used today?
d. Why do we have day and night?

e. Why is spring rain important to a farmer?
f. Why is air pollution a greater problem now than in the past?
g. Why are long range plans for a city important?

h. What are the advantages to some insects in being born alive rather than hatched from an egg?
i. Why was the idea of racial "superiority" or "inferiority" important to the defenders of slavery?
j. Why did the speed of construction become an important factor for men who built the railroads in the West?
k. Why did it take people so many years to find out that the earth is shaped like a ball?

l. Why did American opposition to British rule make it difficult for many people to hold a position in favor of slavery?
m. Why can people use plants and animals in more ways than any other kinds of living things can use them?

STRUCTURING

You have practiced the first phase in developing an explanation, that of listening. Yet good listening is not enough. You need to look deeper into what is being asked.

In this manual, an explanation is considered to be a statement about (a) the relationship, between (b) two or more things. Many kinds of relationships are possible, and we shall discuss some of them. But first, you need to learn how to spot the "things" involved. Then you need to be able to pinpoint the relationship between these things. Finally, you need to be able to identify the general relationship or principle that covers the specific one that you are trying to explain.

So the three steps to be developed in this lesson will help you organize and select the content of your explanations. The three steps are:

(1) Pick out the main "things" in a question.

(2) Determine the relationships between these things.

(3) Determine the general principle involved.

Each will be discussed in order.

Pick out the main "things" in the question

Once you have listened to the question carefully, you should attempt, in your own mind, to pick out the main "things" in the question so that they are clear to you. The main "things" in a question are those concepts. variables, ideas, and so on, that the question deals with.

Unless the main things in the question are clear to you, it will be difficult to formulate an appropriate explanation. Suppose a student asks you, "How could pollution controls increase the price of a new automobile?" The main things in this question are (a) pollution controls and (b) price of a new automobile. Another example might be, "Why does candy contribute to bacterial growth and tooth decay?" The main things are (a) candy and (b) bacterial growth and tooth decay. A third example

is,"Why is cooperation necessary in the growth of a country?" The main things are (a) cooperation and (b) growth of a country. If you could not pick out the main things in these three questions, or in any question a student asks you, you would find it almost impossible to give a good explanation.

EXERCISES

1. Turn on a radio or television talk show and listen for questions. When one of the participants asks a question, listen carefully; then turn down the volume. In your mind, try to pick out the main things in the question. Do this until you can easily pick out the main things.

2. Read the following questions and write (in the space under the question) what you think are the main things involved.

   a. Why should man go into space?

   b. What keeps the earth in orbit?

   c. Why does a spacecraft get hot when it returns to earth?

   d. Why were most of the early railroad lines built in the Eastern United States?

   e. In what ways did the railroads cause change in the manufacture and sale of goods?

Determine the relationship between these "things."

Now that you can listen carefully to the question and pick out the main things in the question, you need to be able to see and understand the relationships between these things. This is important if you are going to have a clear, logical, and meaningful explanation. This again is done in your own mind, to help you structure your explanation.

Let's take the examples we used in the first section. To the question, "How could pollution controls increase the price of a new automobile?", the main things are pollution controls and price of a new automobile. The relationship between pollution controls and the price of a new automobile is that the controls could <u>increase</u> the price. In the second example, "Why does candy contribute to bacterial growth and tooth decay?", the things are candy and bacterial growth and tooth decay. The relationship between these is that candy <u>contributes</u>

to bacteria and decay. In the third example, "Why is cooperation necessary in the growth of a country?", the main things are cooperation and growth of a country. The relationship is one in which cooperation is necessary for the growth of a country.

EXERCISES

In the following questions (a) pick out the main things in each question and (b) determine the relationships between these things. Write the things and their relationship in the space between the questions. The first one has been done to give you an example.

a. Why is water so important to industry?

Things	Relationship
a. Water b. Industry	The importance of a to b.

b. Why is it important to conserve our forests?

Things	Relationship

c. How did railroads affect the use of stagecoaches?
Things Relationship

d. Why was barbed wire so important to the farmers of the west?
Things Relationship

e. Why is herding the main activity in nearly all deserts of the world?
Things Relationship

f. Why does a person die if he stays under water with an artificial breathing apparatus?
Things Relationship

Determine the general principle involved.

The processes you have practiced so far have been listening, determining the main things in the question, and discovering the relationship between these things. Now you will carry this process a step farther. You will work on determining the

general principle involved in the relationship with which the question deals. If you are going to develop a meaningful answer to the student's question, you must know what the general principle is. Then you need to show the student how the relationship he asked about is an instance of the general principle. By determining the general principle, you will have a clear idea of exactly what it is you must explain. Then by applying the general principle to the relationship asked you will develop a meaningful explanation.

Let's look at the three examples again and pick out the general principle. First, "How could pollution controls increase the price of new automobiles?" The main things are pollution controls and the price of new automobiles. The relationship is that of causing an increase in the price. The general principle is that if something extra is added to a unit then the price of that unit will increase in proportion to the cost of the addition. Notice that the general principle is more than a simple extension of the relationship.

In the second question, "Why does candy contribute to bacterial growth and tooth decay?", the things are candy, on the one hand, and bacterial growth and tooth decay on the other. The relationship is that of candy contributing to bacteria and decay. The general principle is that certain kinds of food matter such as that containing sugar, can help the growth of germs which can destroy healthy tissue.

In the third example, "Why is cooperation necessary in the growth of a country?", the things are cooperation and the growth of a country. The relationship is one in which cooperation is necessary for the growth of a country. The general principle is the difficulty of achieving growth without cooperation among the groups or individuals attempting to achieve growth.

Let's look at another example. "What is the difference between segregation de jure and segregation de facto?" The main things are two types of segregation, de jure and de facto. The relationship

is the difference between them. The general principle is that something occurring as a matter of fact differs from something caused by adherence to a law.

EXERCISES

In the following questions, pick out the main things, the relationship, and the general principle and write them in the space below the question. The first one has been done to provide an example of how you should proceed.

a. Why are many words in widely scattered languages so much alike?

Things a. Words in one language
b. Words in other languages

Relationship

Similarity

Principle Words that come from the same origins, such as Latin or Greek, tend to be similar.

b. Why is the globe a good tool for studying the world?

Things

Relationship

Principle

c. Why is it important for a country to have good fuel resources?

Things

Relationship

Principle

d. Why is moonlight really sunlight?

Things

Relationship

Principle

e. Why is water so important to industry?

Things

Relationship

Principle

f. How does trade help the growth of towns?

Things

Relationship

Principle

APPLICATION

VALIDITY

SIMPLICITY

CLARITY

The skills that you have practiced so far need to be applied to the making of the actual explanation. This lesson contains four sections. The first section deals with the way in which you should apply the general principle to the relationship. The next three sections develop three general rules for better explanations. The four sections will provide a beginning in the development of the actual explanation.

Apply the principle to the relationship

So far you have learned that you listen carefully, and then determine the main things, the relationship, and the general principle. Now it is necessary to use words to apply the principle to the relationship and thus make a verbal explanation.

This is an extremely important step. This is the translation from the organization that has been done in your mind to the actual verbal explanation. You now apply the general principle to the relationship asked about in the original question.

Let's apply the general principle to a few relationships without going into a full explanation. (We will develop the full explanation during the following lessons.) Remember, for the question, "Why could pollution controls increase the price of new automobiles?", the general principle was that as something extra is added to a unit the price of that unit will increase in proportion to the cost of the addition. Now that we know the general principle we need to apply it to the actual question. To do this, we can say that pollution controls will add equipment to the automobile and that these additions will increase the price.

In the question, "Why does candy contribute to bacterial growth and tooth decay?", the general principle is that food matter helps the growth of

germs which can destroy healthy tissue. When this is applied to the question you can say that the sugar in candy stimulates the growth of germs which in turn destroy tooth enamel.

In the third question, "Why is cooperation necessary in the growth of a country?", the general principle is the difficulty of achieving growth without cooperation among the groups or individuals attempting to achieve growth. When this is applied to the actual question, we could point out the areas of social and economic growth that would be difficult, if not impossible, to expand without the cooperation of the various segments of a country.

The key to applying the principle to the relationship is the translation of the general principle into the terms, or the "things" and "relationship," of the original question. If you can do this, then your chances of developing a complete and understandable explanation are excellent.

EXERCISE

Using the questions in the last exercise of Lesson 2, translate the general principle that you had developed into an actual explanation. Write your answers in the space below.

a. _____

_____

_____

b. _____

_____

_____

c. _____

_____

_____

d. _____

_____

_____

e. _____

_____

_____

f. _____

_____

_____

Validity

You are now at the point where you can, in fact, use words to tell the student something. The question is, how well can you do this? You have structured your answer and selected the content. This is good. Yet there is more to a good explanation than just this. One aspect is validity. By validity we mean that your answer must be true, correct, and accurate. You don't help students by giving them false explanations, nor do you help them by giving them half-truths.

You see this problem every day. Have you ever been at an accident, an anniversary party, a wedding, or any newsworthy activity only to read about it later and comment that the facts are true, but the story did not portray the situation accurately?

You should make an honest attempt to make your explanation as true and accurate as possible. For instance if you were to say that man cannot travel at the speed of light because it is impossible, this would be true according to what we know today. However, it would not be a very adequate explanation. There is more true and pertinent information that could be added to make the statement more adequate. Along the same line, if you were to answer that candy is bad for your teeth, this would be true. But your explanation would be more adequate if you added information on the relationship between candy, bacteria, and decay.

Simplicity and Clarity

The English language can be utilized in such ways as to debilitate the listener's capacity to comprehend the speaker's intended significances. The abiding predilection among practitioners in variegated fields of specialized endeavor is to manifest their cerebrations in unnecessarily esoteric phraseology which obfuscates their formulations and renders them almost incomprehensible.

All right, what did we just say? After trying to see through the maze of fuzzy words and confusing phraseology, we hardly know. But we shall attempt a translation: "English can be used to make things harder to understand. People in many areas of learning often use such weird language that few people can understand them."

Teachers have not been immune to this tendency to make explanations much more difficult and confusing than they need to be. Rather than use difficult forms, you should always attempt to use simple terms. Consider the knowledge and the experience of your students. You must speak to them in words and terms that they understand.

Don't say: "Carbohydrates in the crevices of the teeth facilitate the growth of caries-producing organisms, and this bacterial metabolism and growth in the mouth lead to destruction of both tooth enamel and dentin. Therefore it is now generally agreed that dental caries are unquestionably of bacterial origin." It would be better to simplify your explanation by saying that carbohydrates, such

as the sugar in candy, help harmful bacteria to grow, and these bacteria help cause tooth decay.

"In group situations, Johnny demonstrates a marked tendency to relieve his latent anti-social hostilities with aggressive manifestations." (Translation: Johnny gets into fights with other children.)

"The committee has concluded that non-preferential treatment of persons in the lower socioeconomic brackets is a causative factor in a not inconsiderable number of animosities." (Translation: Many poor people who aren't treated fairly get angry.)

Why do people smear clear thoughts with verbal sludge? One reason might be that their ideas are not clear. Unnecessarily complex explanations make excellent camouflage for fuzzy thoughts. If the students aren't clear as to what the teacher is saying, they can't judge his thoughts.

Clarity is important in an explanation. If you are not clear, it makes no difference how good

your facts are or how accurate your explanation is. You won't be understood anyway. When you are developing an explanation, try to leave out information that will only muddle the explanation. And seek simplicity.

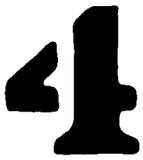
Don't say: "Controls which will mitigate the noxious elements in the air will require adding expensive equipment to an automobile and in turn will increase its net cost." All you need to say to make your point and keep the explanation clear is that "Pollution controls on cars cost money to produce and install. So this extra equipment will add to the cost of the car."

EXERCISE

From the exercises in Lessons 1 and 2, choose any three questions that you feel you can most effectively answer. Write out the answers on the paper provided below. Then, go back over the written answer looking for ways to improve its accuracy, simplicity, and clarity.

FOCUS

RULE-EXAMPLE-RULE



VAGUENESS

SUMMARIZING

You have had the opportunity to read about and practice the skills of organization, content selection, application, validity, simplicity, and clarity. By this time you should feel confident about your ability to explain. You have a right to feel confident. You have covered and practiced a great deal of material.

This lesson will develop four more skills. When these skills are used together with what you have learned so far, you will have a strong basis for making explanations. The four skills are those of (1) focusing attention on important points, (2) using the rule-example-rule pattern, (3) avoiding vague words, and (4) summarizing the explanation.

Focus attention on important points.

During your explanation you want to make sure that the student is aware of the most significant points in the explanation. If you do not make a conscious effort to focus his attention on the important points, there is a good chance that he will not catch them.

An announcer on a radio talk show uses a number of effective methods to insure that his audience is aware of the main points in his answers. Sometimes he will raise the tone of his voice when he comes to an important point. At other times he will lower the tone of his voice. He might pause before a key point in order to let his listeners know an important point is coming up. He might very well repeat an important point a couple of times. Many times he will repeat all of the main points at the end of an explanation. Sometimes he will simply stop after an especially important point and ask if everyone understands.

The main thing is that you consciously stress

the important points in your explanation. You can do this either by verbal emphasis or repetition. Whatever method or combination of methods you use, make it useful in assuring that your students are focused in on the essentials of the explanation.

EXERCISE

Turn once again to a radio or television talk show. Listen to the answers to questions that are asked during the course of the show. In your own mind try to determine if the person answering the question is emphasizing his major points. If he is, how is he doing it? What techniques is he using for emphasis? If not, what would you do in order to emphasize his main points and make them stand out?

Rule-example-rule

An extension of the idea of focusing on important points is the rule-example-rule pattern. Essentially the rule-example-rule pattern is the presentation of a statement, followed by details, and concluded by the structuring statement. This pattern has

been shown to be effective in teaching. It gives you a pattern which can easily be followed. For example, if you were talking about the problem of inflation, you might begin with a general statement such as "The Secretary of the Treasury is attempting to deal with problems of inflation." You would follow this general statement with a number of examples, (1) controlling price rises, (2) recommending an increase in interest rates, (3) meeting with big business, (4) requesting the public to cut back on luxury purchasing. You would close by restating the general statement, such as, "So you can see that they are dealing with the problem of inflation." You could restate the principle indirectly by beginning the next sentence with "In addition to dealing with the problem of inflation...."

The question of pollution controls and the price of new automobiles lends itself to this pattern. A general statement in your explanation might be that pollution controls add extra equipment to the automobiles. Some examples that you might give after

this explanation are better muffler linings, better exhaust manifolds, more efficient piston action, better spark plugs, and recycling of exhaust fumes. You could point out that this extra equipment has an effect on the price and go on to explain why.

The rule-example-rule pattern gives you something to hang on to. This pattern not only focuses attention on the point that you want to get across, but also gives some useful structure to your explanation.

EXERCISE

Take the three questions that you used in the last exercise of Lesson 3. Rework the three explanations so that you use the rule-example-rule pattern at least twice in each. Use the paper provided below.

Vagueness

Let's turn vagueness loose on American history. Patrick Henry's ringing "Give me liberty or give me death" then becomes "Under many circumstances, I would prefer to be in a situation where some of my freedoms are to a large degree unimpeded. Lacking that, I might prefer a somewhat more rapid ending of my existence."

It is unfortunate that some people feel that the use of vague words, phrases, or sentences makes what they say more impressive. But, by being vague, you confuse. The example above has more things wrong with it than just vague words. It also has problems with clarity and simplicity which we discussed earlier.

More often vagueness is characterized by an excessive proportion of qualification, haziness, and ambiguity in an explanation. It is much more subtle than the example given at the beginning of this section. An explanation that has a large number of words such as "more or less," "pretty much," "quite a bit," "might," "possibly," "more often

than not," "usually," and "most of the time" will tend to make what you are trying to say vague to the listener. When you are developing an explanation you need to be careful not to use words that make your meaning vague. In an explanation you could say, "More often than not pollution controls might add some extra equipment to a car, and most of the time this would probably cause the price to rise a bit." However, chances are that an explanation as vague as this would cause confusion among your students. It would be better to say, "Pollution controls add extra equipment to a car, and this extra equipment will increase the price of the car."

EXERCISE

Take out the explanations you have written out for the last exercise in Lesson 3 and the previous exercise on rule-example-rule. Go over these explanations, identifying and correcting places where you have used vague words.

Summarizing

By this time you should be able to develop a well thought through, logical, and clear explanation. You should be able to give this explanation in a way that is understandable to your students. But there is one more step worth including, especially when your explanation has been long and detailed. This is summarizing your explanation. This practice is useful because (1) it gives you a chance to review the main points of the explanation to see if anything has been left out, (2) it gives the students a review of the main points, (3) it will clarify the answer for those who did not quite understand.

Summarizing is basically boiling down the explanation to its essential facts and details. Therefore, in choosing what to include in the summary, you are also deciding what to omit. Pick out the main ideas and the most important or colorful supporting facts in your explanation.

Once you have done this you can present your summary. Do it crisply. Avoid long sentences and excessive use of conjunctions, especially "and."

Let's look at the question, "Why does candy contribute to bacterial growth and tooth decay?" After developing your explanation, your summary would include:

a. Candy has sugar in it.

b. Sugar stimulates the growth of bacteria.

c. Bacteria destroy tooth enamel.

EXERCISE

Develop and write out a summary for the three explanations you used in the previous exercise. Use the space provided below.

CHECK

ON

YOURSELF

All right, it's time to take a look back and see how well things have been going. This lesson will check out your understanding of the important ideas we have developed. It will give you the chance to apply your knowledge to some complete explanations. But first, let's develop an explanation from the beginning. This will give you a chance to review before you set out on your own.

Suppose a student asks, "Why does the side of a mountain nearest to the ocean get the most rainfall?" You have listened to the question carefully and you have fully understood it. Now it is time to apply our lessons to answering the question, taking into account the skills of accuracy, clarity, simplicity, focus, rule-example-rule, avoiding

vagueness, and summary. In your mind you decide that:

(1) the main things are mountain, ocean, and rainfall,

(2) the relationship is that one side of the mountain, in this case that one nearest the ocean, gets more rainfall than the other side,

(3) the general principle involved is that air cools as it rises, and cool air cannot hold as much moisture as warm air.

Now you verbally develop the explanation:

Air cools as it rises. Cool air cannot hold as much moisture as warm air. As winds climb mountains and cool off, the clouds begin to drop their moisture. Much of it falls as rain or snow on the windward side of the mountains.

We can use as an example the region of the Pacific ocean and our country's West Coast mountains. Most of the winds from this region blow from the Pacific Ocean. They are called westerly winds because they blow from the west.

The westerly winds pick up moisture as they blow over the Pacific. Some of the moisture can be seen in the form of clouds. When these winds, full of moisture, reach the land they find their way blocked by mountains. Up the winds go -- over the mountaintops!

When the winds reach the eastern side of the mountains, there is only a little moisture left in them. Only a few clouds can be seen. That is why the lands just east of the mountains get so little rain.

Be sure to remember that winds pick up

> moisture from the ocean. When the winds reach the mountains they go up. The air cools as it rises. Cool air does not hold as much water as warm air. Thus most of the water falls as it rises on the ocean side of the mountain.

The explanation is accurate. The language is kept simple. The information is clear. It is not cluttered with unnecessary information. The organization of the explanation follows the rule-example-rule pattern. The explanation lends itself very well to verbal and tone-of-voice emphasis. There is a conscious attempt not to include vague words such as more or less, pretty much, usually, and so on. The summary is quick, concise, and to the point.

The manual has attempted to equip you with tools that will enable you to explain effectively. You have had opportunities to practice fielding questions, however, it is more difficult to field questions posed to you in the actual classroom situation. You need a great deal of self-discipline if you are to provide concise, clear, and valid responses. When you are asked a question, take the

time to think about what is being asked. If you need to, ask the student to clarify the question or his assumptions. Try to formulate the answer in your mind before you answer the question. It may take more time, but your answer will be better understood and that's what counts.

Now that we have done a quick review of the main points, it is time for you to develop some explanations.

EXERCISE

Three questions were introduced in the first lesson of this manual; we have returned to these questions in each lesson. Take two of the three questions and write out complete explanations below. Be sure to include all of the skills we have discussed. The three questions are:

1. How could pollution controls increase the price of a new automobile?
2. Why does candy contribute to bacterial growth and tooth decay?
3. Why is cooperation necessary in the growth of a country?

POSTSCRIPT

You may be interested in some of the material that was used in developing this manual. If some sections intrigued you, you may wish to do some further reading on your own. I will cite and briefly comment on the materials used. The complete reference list follows this section.

As in the development of any material, there must be a beginning. In this case, the idea was developed from the work of Gage and his associates (1968). This research has been exploring the teacher's effectiveness in explaining. This research in turn had been preceded by such studies as those of Hart (1934), Smith and Meux (1962), and Hyman (1968). These researchers had found that explaining was indeed an important aspect of the teaching act.

The first section of this manual, on the logical organization of an explanation and the selection of content, is based on treatments of

logic and teaching by Swift (1961), Smith and Meux (1962), Thyne (1963), Bellack and his associates (1966), Copi (1968), and Ennis (1969). These writings give clear and concise information on the logical structure of teaching and selection of content. They also expand these topics beyond the realm of explaining.

The second section of the manual, that of general application, was developed from a variety of sources. Swift (1961), Thyne (1963), Hempel (1965), and Copi (1968) develop in detail the ideas of validity, clarity, simplicity, and summary. Focusing attention on important points was found to be related to effectiveness in teaching by Shutes (1969) and Pinney (1969). The rule-example-rule pattern of teacher behavior was identified as important in teacher effectiveness by Rosenshine (1968, 1969). Hiller, Fisher, and Kaess (1969) developed the notion of vagueness and its detrimental effect on learning.

The form of the manual relied heavily on

readability research, or determinations of the variables in prose which correlate with ease of reading comprehension. Research by Funkhouser (1967) on problems in communicating science materials to non-scientists was used as a basis for the manual development. His study cites many of the major readability studies.

The practice procedures used during the training sessions were developed from pilot work done by Bryce Hudgins and his students at Washington University in St. Louis.

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APPENDIX B

ADMINISTRATIVE PROCEDURES FOR THE "HOW TO EXPLAIN" PROGRAM

Administration Manual for "How to Explain" Program

Practice Session Instructions and Questions

Sample Transcripts of Videotaped Instructions

ADMINISTRATION MANUAL
for
"HOW TO EXPLAIN" PROGRAM

Objectives of the Program

The "How to Explain" program has been designed to help teachers improve their explaining behavior. The five lessons in the manual help the teacher understand major aspects of good explanations, and give practice in improving these aspects. To successfully complete the program, one must follow certain procedures. These procedures will be discussed in the following sections.

Training Requirements

Materials. Training supervisors should check to see that they have the following training materials:

- "How to Explain" Manual (one per trainee)
- Pretest and Posttest questions
- One tape recorder for each two trainees
- Two one-hour tapes for each trainee
- Videotape instructions
- Instruction packets for each practice session
- Packet of questionnaires for each trainee

Facilities. Minimum physical requirements for administering the "How to Explain" program are:

- One large-group meeting place with videotape equipment
- Enough space for pairs of trainees to work without interruption
- Small rooms for administering the pretest and posttest

Administration

Orientation. The administration of the "How to Explain" program will be complicated by the fact there will be an experimental group and a control group. During the orientation session the experimental group will view Introductory Videotape A. The control group will view Introductory Videotape B. Both groups will receive instructions on when the report for their pretest. The introductory videotapes inform each group of its duties during the "How to Explain" program.

Pretest. After the orientation, the pretest will be administered to all subjects according to the scheduled times. All subjects will explain something in response to stimulus questions asked by the training supervisor. Each subject will be asked to explain three things. All questions and explanations will be tape recorded. The procedure will be:

- Tell the subject to imagine he is explaining the questions to students in a class and to answer the stimulus questions from that point of view.
- Turn on the tape recorder and ask the first question.
- Allow the subject to respond.
- Follow the response immediately with the second question.
- Follow the second response immediately with the third question.
- After the third response, turn off the tape recorder.
- Ask the subject not to discuss the questions with other subjects until after the program is completed.
- Take the tape out of the tape recorder and mark it with the subjects name.
- Place a new tape in the recorder and follow the same procedure with the next subject.

Practice sessions. The experimental group will use the manual as the basis for training. The five lessons in the manual will be done on successive days in five one-hour sessions. Each lesson with its written exercises will be handed out the day before the practice session. Each practice session will call for the subjects to have read in advance and completed the exercises in the assigned material for that session. In Lesson 1 the practice procedure will follow a programed Xerox Listening Tape. In the other four practice sessions the subjects will work with a self-selected fellow trainee. Trainee A will ask Trainee B to explain a specific given matter. All practice explanations will be tape recorded. This will be followed by a critique led by Trainee A, in which both trainees listen to and discuss the tape recording of the explanation. This same procedure will be then reversed with Trainee B asking the stimulus question and Trainee A responding. Trainee B then leads the critique as both listen to the tape recording. Videotape instructions and packets for the subjects for each lesson will be provided.

The control group will not be given the training manual. Instead they will be given a list of stimulus questions and told to think about how they would respond to questions such as these. The control group will do this during the time the experimental group is practicing in pairs.

Posttest. The subjects, after training, will be required to take a posttest conducted exactly like the pretest, except that the simulus questions will not be the same as those for the pretest.

Summary of Practice Session Instructions

Practice Session 1

Materials:

- One tape recorder
- Xerox "Effective Listening" Program and booklets
- Xerox Administration Manual

Facilities:

- One large group meeting place

Procedure:

- Follow the instructions in the Xerox Administration Manual
- Distribute and collect Listening Questionnaire
- At end of session distribute Lesson 2

Practice Sessions 2, 3, 4, and 5

Materials:

- One tape recorder for each two participants
- Videotape equipment
- Demonstration Videotapes C, D, E, F
- Instruction packet for each participant for each practice session
- Practice Session Questionnaires

Facilities:

- One large-group meeting place with videotape equipment
- Enough space for pairs of trainees to work without interruption

Procedures:

- Distribute training packets for appropriate practice session
- Distribute tape recorders and tapes
- Play appropriate Demonstration Videotape (C, D, E, or F)
- Divide into teams and begin training procedure as demonstrated on videotape
- Distribute and collect Practice Session Questionnaire
- At end of Practice Session distribute appropriate Lesson for next day
- At end of Practice Session 5 distribute time schedule for posttest

INSTRUCTIONS FOR PRACTICE SESSION 1

During this session you will follow the procedures outlined for you in the Xerox Effective Listening Program manual that you have on your desk. Do not open this manual until instructed to do so by the instructor. Once the session gets underway be sure that you listen carefully to the instructor and follow his directions. This is a self learning program and in order to get the most benefit from it you will need to follow instructions carefully.

INSTRUCTIONS FOR PRACTICE SESSION 2

During the remainder of this session, you will follow the practice procedure which was just demonstrated on the videotape. Below is an outline of the main points developed on the videotape. These are provided as a reminder and for guidance on procedure. Read the entire outline before beginning.

Practice Procedure:

- Take a few minutes and review the exercises both of you completed last night. If there is any disagreement discuss and resolve the problem.
- Read the instructions on the Question Card.
- Start the tape recorder.
- The person with the yellow card will ask the first question.
- After the response, rewind the tape in preparation for the critique session. Then begin the critique session.
- After the critique session the person with the blue card asks the next question.
- Alternative asking questions until all questions on both cards have been asked, answered, and criticized.

Critique Session. During the playback of the response to the question, you should follow the same procedure and focus on the same points as were illustrated in the demonstration videotape. The points were:

- Did you pick out the correct main "things" in the question?
- Could you determine the correct relationship between these things?
- Were you able to determine the general principle involved?

QUESTION CARD - LESSON 2

Read the following instructions aloud to your partner before you turn on the tape recorder and ask the first question.

Listen to the question I am going to ask you. As soon as I ask it, tell me three things:

1. What were the main things in the question?
2. What was the relationship between these things?
3. What was the general principle involved?

Yellow Question Card:

Question #1 - "Why do you need joints in your body?"

Question #2 - "Why is the sun important to us?"

Question #3 - "Why did the Indians attack the colonists?"

Blue Question Card:

Question #1 - "What use is an index?"

Question #2 - "Why is the amount of rainfall important to a country?"

Question #3 - "Why is Alaska so sparsely populated?"

INSTRUCTIONS FOR PRACTICE SESSION 3

During the remainder of this session, you will follow the practice procedure which was just demonstrated on the videotape. Below is an outline of the main points developed on the videotape. These are provided as a reminder and for guidance on procedure. Read the entire outline before beginning.

Practice procedure:

- Briefly review exercises done last night and resolve differences.
- Read the instructions on the question card.
- The person with the blue card will ask the first question.
- After the response, rewind the tape and begin the critique session.
- Alternate asking questions until all questions on both cards have been asked, answered, and criticized.

Critique session. During the playback of the response to the question, you should follow the same procedure and focus on the same points as were illustrated in the demonstration videotape. The points were:

- Was the principle applied properly to the relationship?
- Could the explanation be made more valid?
- Could clarity be improved in the explanation?
- Was the explanation kept simple enough?

QUESTION CARD - LESSON 3

Read the following instructions aloud to your partner before you turn on the tape recorder and ask the first question.

Listen to the question I am going to ask you. As soon as I ask it, do four things:

1. Tell me what the main things in the question were.
2. Tell me what the relationship is between these things.
3. Tell me what the general principle involved is.
4. Apply the principle to the relationship by giving me an explanation to my question.

Be sure to consider the validity, simplicity, and clarity of your explanation.

Yellow Question Card:

Question #1 - "Why do you need exercise and rest?"

Question #2 - "Why did the settlers move West?"

Blue Question Card:

Question #1 -"Why do we have to pay taxes?"

Question #2 -"Why is soil one of our most important resources?"

INSTRUCTIONS FOR PRACTICE SESSION 4

During the remainder of this session, you will follow the practice procedure which was just demonstrated on the videotape. Below is an outline of the main points developed on the videotape. These are provided as a reminder and for guidance on procedure. Read the entire outline before beginning.

Practice procedure:

- Briefly review exercises done last night and resolve differences.
- Read the instructions on the Question Card.
- The person with the yellow card will ask the first question.
- After the response, rewind the tape and begin the critique session.
- After the critique session the person with the yellow card asks the question again. The other person then responds again, attempting to improve on his first response.
- This procedure will be repeated until all questions on both cards have been asked, answered, and criticized twice.

Critique Session. During the playback of the response to the question, you should follow the same procedure and focus on the same points as were illustrated on the demonstration videotape. The points were:

- Were you verbally focusing attention on the important points?
- Did you use the rule-example-rule pattern effectively?
- Did you avoid the use of vague words?
- Could the summary be made more effective?

QUESTION CARD - LESSON 4

Read the following instruction aloud to your partner before you turn on the tape recorder and ask the first question.

Listen to the question I am going to ask you. As soon as I ask it, determine the things, relationship, and general principle in your own mind. Then give me an explanation to my question paying particular attention to:

1. Focusing attention on important points.
2. Using the rule-example-rule pattern.
3. Avoiding vague words.
4. Developing a summary.

Yellow Question Card:

Question - "Why have we set aside lands for parks and recreation?"

Blue Question Card:

Question - "Why should you call the doctor if you are sick?"

INSTRUCTIONS FOR PRACTICE SESSION 5

During the remainder of this session, you will follow the practice procedure which was just demonstrated on the videotape. Below are the main points of the videotape, provided as a reminder and for guidance. Read the entire outline before beginning.

Practice Procedure:

- Read the instructions on the question card.
- The person with the blue card will ask the first question.
- After the response, rewind the tape and begin the critique session.
- After the critique session, the person with the blue card will ask the question again. The other person will respond again, attempting to improve on the first response.
- Next, the person with the yellow card will ask the question.

Critique session. Follow the same procedures and focus on the same points as were illustrated in the demonstration videotape. The points were:

- Did you pick out the correct main "things" in the question?
- Did you determine the correct relationship between these things?
- Were you able to determine the general principle involved?
- Was the principle applied properly to the relationship?
- Could the explanation be more valid?
- Could the clarity or simplicity be improved?
- Were you verbally focusing attention on important points?
- Did you use the rule-example-rule pattern effectively?
- Did you avoid the use of vague words?
- Could the summary be made more effective?

QUESTION CARD - LESSON 5

Read the following instructions aloud to your partner before you turn on the tape recorder and ask the first question.

Listen to the question I am going to ask you. As soon as I ask it, determine the things, relationship, and general principle in your own mind. Then give me as complete an explanation as you can, taking into account all of the aspects of effective explanation that you have read about and practiced up to this point.

Yellow Question Card:

Question - "Why do industries spend huge amounts of money on advertising?"

Blue Question Card:

Question - "Why should everyone be concerned with water pollution?"

VIDEOTAPE TRANSCRIPTS

Introductory Videotape A

INSTRUCTOR: During the next week you will have an opportunity to practice an aspect of teaching that is usually ignored. This aspect is the ability to explain orally and extemporaneously. Every day teachers are asked to explain something to their students. Usually these explanations are extemporaneous. A student thinks of a question to ask and asks it. The quality of the teacher's explanation is important. The teacher wants to make sure that the student gets a clear and not a cloudy picture of what he asks. The training which you are going to participate in during the next week is designed to help you explain more effectively. You will have the opportunity to read about a number of ways to explain effectively. You will also have the opportunity to explain what you have read. You will be asked to do a number of things during this next week. It is of the utmost importance that you be in the proper place at the assigned time. If you do this, you will be able to start and finish on time. Because this training is being run on an experimental basis, we are going to ask you not to discuss either the questions asked or the material covered with other students in the class. Others will be given some of the same questions and some of the same material only at different times.

INSTRUCTOR: Thus it is very important that you refrain from discussing the training procedure, the questions, or the material that you have covered until after we have completed the entire training program. I'm sure that you are going to get a great deal out of this training program. Now we will pass out the time schedules for tomorrow and give you the opportunity to ask any questions that you may have.

Introductory Videotape B

INSTRUCTOR: During the next week you are going to have the opportunity to practice an aspect of teaching that is largely ignored. This aspect is the ability to explain orally and extemporaneously. Every day teachers are asked to explain something to students. Usually these explanations are extemporaneous. A student thinks of a question and asks the teacher. The quality of the teacher's explanation is important. The teacher wants to make sure that the student gets a clear and not a cloudy picture of what he wants to know. The training which you are going to participate in during the next week is designed to help you explain more effectively. You will be asked to do a number of things during this next week. It is of the utmost importance that you are on time; that you report to where you are supposed to be at the assigned time. If you do this everybody will be able to start and finish

INSTRUCTOR: on time. Because this is an experimental training program we are going to ask you not to discuss your activities with other members of the class. Some of the questions that you are going to be asked will be asked to others at different times. So please refrain from discussing any of your activities or any of the questions that you deal with during this training period with any members of the class. You may discuss it with them after we have finished the entire week-long training program. I think you are going to get a great deal out of this program. So now we will hand out your time schedules for tomorrow and answer any questions that you may have.

DEMONSTRATION VIDEOTAPE C

INSTRUCTOR: Today you are going to follow a procedure that is different from the procedure that you followed yesterday. Today you will be working with your partner and a taperecorder. Now you all know who your partner is and you also know how to operate a taperecorder, so this is no problem. What we will do on this videotape is demonstrate to you the practice procedure that you will follow today. We will do this so that everybody will understand exactly what they are to do. The first thing that you will receive today will be a packet. In this packet there will be:

(1) Instructions for today.
(2) A question card.

One of you will have a blue question card and the other will have a yellow question card. There are different questions on these two cards, and you will see why in just a moment. Rather than attempt to go through a detailed explanation of what we expect you to do today, we thought it would be better if we gave you a demonstration of the procedure that we want you to follow. So we will have two people demonstrate this procedure on the video tape. Now, when they finish the demonstration, we will give you time for any questions that you might have before you go into your own practice.

Diane and Jerry, here are your two folders and you can go ahead with your practice session now.

Jerry: Let's see, we're supposed to take a few minutes and review the exercises that we were supposed to have completed last night. And if there are any disagreements or things of this sort we're supposed to discuss them and resolve the problem. I guess we can get through this pretty quickly. They weren't that hard. First, the "things" of the question, for question one: "Why is moonlight not as bright as sunlight?" I picked out moonlight and sunlight.

Diane: I got those answers too. The second one; "Why does a person die if he stays under water too long?" I got person and water.

Jerry: That's right. Those are very natural. For the relationship of the questions between the "things," I have; "Why is moonlight not as bright as sunlight?" One not being as bright as the other as relationship in the question.

Diane: Yeah. I got something similar to that. "Why does a person die if he stays under water too long?" I thought the relationship was a person staying under water too long.

Jerry: Right. I had something to that effect. For the "principle," in the first question, "Why is moonlight not as bright as sunlight?", I had; Refracted light not as bright as original light. The light coming off the sun bounces off the moon and sends it back to earth and that light is definitely not as strong as the original light coming from the sun. That's the broad scientific principle there.

Diane: Excellent! You impress me!

Jerry: The second one there.

Diane: "Why does a person die if he stays under water too long?" I think something like a living organism will die if it stays under water.

Jerry: That's good but the thing that comes to mind is that there are fish and other organisms which live under water, so I don't know if that's quite complete enough.

Diane: What could be better? I had trouble with that one too.

Jerry: Well the question refers to a human being so we might include that in the principle. Something on the fact that human beings will die from lack of oxygen. As the question suggests it's not necessarily staying under water, it's the length of time.

Diane: Yeah, that's much better.

Jerry: Let's see what else we have to do here. It says we're supposed to practice asking these questions and going through the same procedure. The person with the yellow card which I have here, is supposed to ask the first question. We're supposed to use this tape recorder. With this, record it and then critic each other's responses. Let me ask you the first question. Before I do that I will read the instructions to you. It says: Listen to the question I'm going to ask you. As soon as I ask it tell me three things:

1. What were the main things in the question?
2. What were the relationships between these things?
3. What was the general principle involved?

I'll turn on the tape recorder and ask you these questions and you can go from there. "Why is water so important to industry?"

Diane: I guess the "things" would be water and industry. And then the

relationship would be the importance of water to industry. And the principle would be that water is the source of energy used by industry.

Jerry: OK. I'll rewind the tape and see if I have to critique it. Sounded pretty good, Diane.

REPLAY OF TAPE

Diane: OK, I have the blue sheet so I'll ask you the next question. Want to turn the tape recorder on? "Why are the Steppe regions so sparsely populated?"

Jerry: Well, Steppe regions would be one of the "things" and population would be the other. And sparseness in population of these regions would be the relationship. And for principle, something like, I guess, altitude is a factor in population growth.

REPLAY OF TAPE

Diane: That's good. I wonder if the greater question isn't really that the Steppe regions are in a low altitude area. Because there are Steppe regions at all different altitudes. So maybe it should be specified.

Jerry: That's a good point, I should have included it because it was in the question.

Diane: That's good. Altitude is definitely one of the factors we're concerned with here. Something I think there might be a blotter principle. Something in addition to altitude principle is greater, maybe that comes into play here.

Jerry: Well, that's good. We might use as a principle something in those areas that don't support life easily, don't attract very many people.

Diane: That's good.

Jerry: OK, let me ask you the next question. Why is it difficult . . . .

INSTRUCTOR: You have now watched the procedure for a practice session. Exxentially this procedure consists of:

1. Reading the instructions in the packet.
2. Reviewing the exercises you completed last night and resolving any differences.
3. Using the tape recorder, the person with the yellow question card asks a question and the person responds in the way he was instructed to respond. The tape is then rewound and played back.

INSTRUCTOR: During this playback both of you will critique the response in an attempt to correct flaws. After the critique session the person with the blue card asks the next question and the other person responds. You alternate asking questions until all questions on both cards have been asked, answered, and criticised. Remembers, you are not expected to answer all of the questions accurately. This is why you have a critique after each question, to discuss how you could develop a more accurate answer. Now, we will answer any questions you may have and then we will have you begin your practice sessions.

APPENDIX C

RATING AND CODING INSTRUCTIONS

Student Rating Manual

Student Rating Sheet

Transcripts of Sample Pretest and Posttest Answers

Coding Manuals for Content Analysis

- Content Validity
- Logical Organization
- Lesson Divisions
- Verbal Emphasis
- Rule-Example-Rule

STUDENT RATING MANUAL

Rating Session

The rating session is designed to obtain student ratings of the six questions that they will be listening to. In order to obtain useful and meaningful ratings it is necessary to follow certain specified procedures. These procedures will be discussed in the following sections.

Rating Requirements

Materials. Rating supervisors should check to see that they have the following materials:

- Tape recorder
- Cassette tape containing randomized questions
- Rating sheets
- Pencils

Facilities. Minimum physical requirements for administering the rating procedure are:

- An acoustically sound room so that all student raters can adequately hear the tape recorder.
- Enough room so student cannot observe each others ratings.

Rating Session Instructions

Once the students are in the room, explain to them that they will be rating six questions. At this point pass out the pencils and a practice rating sheet to each student rater.

Starting at the top of the rating sheet explain the rating procedure and define the terms used in the rating sheet. The general procedure will be:

- Explain that there will be six answers to rate. They will listen to each question and its corresponding answer and then rate the answer on four dimensions.
- The first dimension is organization (point this out on the rating sheet). Organization is defined as how well the answer is structured or organized so that it develops a smooth and logical argument for or answer to the question. A well organized answer will proceed toward a conclusion in an orderly fashion and will not "skip all over the countryside" with loosely connected facts. This dimension will be rated on an excellent, good, average, below average, and very poor scale. In other words, if you thought an answer was excellently organized you would circle "excellent" on the rating sheet. On the other hand, if you felt the answer was only average you would circle "average" on the rating sheet. (At this time point out the question referring to organization on the rating sheet and ask if there are any questions.)
- The second dimension is clarity (point this out on the rating sheet). Clarity is defined as whether or not the ideas or concepts that the teacher is trying to explain are easily understood by the listener. If you are having trouble understanding exactly what is being said or are consistently being confused by the words or phrases the teacher is using, the explanation is not very clear. Clarity will be rated on the same scale as organization - from excellent to very poor. (At this time point out the

question referring to clarity on the rating sheet and ask if there are any questions.)

- The third dimension is called quality. Here, we want to know your feelings about the overall quality of the answer. What did you feel about the quality of the explanation? Was it an excellent, good, average, below average, or very poor answer? You will circle on the rating sheet the appropriate rating. (At this time point out the question referring to quality on the rating sheet and ask if there are any questions.)
- The fourth dimension is rank. Rank is recorded after all of the explanations have been listened to. Rank is simply placing the answers in order from best to worst. You will use a 1 to 6 scale, with 1 being equal to the best answer and 6 being equal to the worst answer. (At this time point out the spot on the rating sheet where rank will be rated and ask if there are any questions.)
- Now play the practice question tape and have the student raters practice rating the three questions on the tape. After they have finished rating the practice questions check to see that everyone understands the procedure. Allow time for questions. Begin rating the experimental tape when all questions have been adequately answered.

Review Outline of Rating Session Procedures

Materials:

- Cassette tapes containing questions and answers.
- Tape recorder.
- Rating sheets.
- Pencils.

Facilities:

- A room large enough for 10 raters to work comfortably and easily hear the tape recordings.

Procedure:

- Introduce the rating task and the rating sheets to be used.
- Explain the rating procedure and the definitions of the four dimensions (organization, clarity, quality, and rank) to be rated.
- Play the practice tape and have each rater complete a practice rating sheet.
- Check to see that all raters understand the procedure.
- Begin the rating of the experimental tape.
- When the rating is completed, collect the rating sheets, dismiss the raters, and prepare for the next group.

STUDENT RATING SHEET

A. _____

1. The organization of the answer was:
   Excellent Good Average Below average Very Poor

RANK ____

2. The clarity of the answer was:
   Excellent Good Average Below average Very Poor
3. I felt that this explanation was:
   Excellent Good Average Below average Very Poor

B. _____

1. The organization of the answer was:
   Excellent Good Average Below average Very Poor

RANK ____

2. The clarity of the answer was:
   Excellent Good Average Below average Very Poor
3. I felt that this explanation was:
   Excellent Good Average Below average Very Poor

C. _____

1. The organization of the answer was:
   Excellent Good Average Below average Very Poor

RANK ____

2. The clarity of the answer was:
   Excellent Good Average Below average Very Poor
3. I felt this explanation was:
   Excellent Good Average Below average Very Poor

D. _____

1. The organization of the answer was:
   Excellent Good Average Below average Very Poor

RANK ____

2. The clarity of the answer was:
   Excellent Good Average Below average Very Poor
3. I felt this explanation was:
   Excellent Good Average Below average Very Poor

E. _____

1. The organization of the answer was:
   Excellent Good Average Below average Very Poor

RANK ____

2. The clarity of the answer was:
   Excellent Good Average Below average Very Poor
3. I felt this explanation was:
   Excellent Good Average Below average Very Poor

F. _____

1. The organization of the answer was:
   Excellent Good Average Below average Very Poor

RANK ____

2. The clarity of the answer was:
   Excellent Good Average Below average Very Poor
3. I felt this explanation was:
   Excellent Good Average Below average Very Poor

Sample Transcript - Sequence A

Pretest Question 1

Why does climate affect the way people dress?

People have to dress according to their needs. The weather and the climate affect the people. That means however hot it is or however cold it is, they have to dress according to that. You come to school with a jacket when it's colder. You come to school without a sweater when it's warmer. Therefore, you can tell that, according to the weather and the climate you dress to meet their needs.

Sample Transcript - Sequence A

Pretest Question 2

Why must we conserve our trees?

There are several important reasons why we should try to conserve our trees. One is from the beauty aspect that, um, that trees are very pretty and they could be tourist attractions. Another would be, uh, to prevent erosion. If trees are taken up then, uh, possible erosion of the land could take place. Also, uh, trees help if there are any floods, to stop waters. Also trees have green leaves on them to help produce the, uh, help our air produce the oxygen for our air for breating purposes.

Sample Transcript - Sequence A

Pretest Question 3

Why are good transportation facilities important to farmers?

Well primarily because, uh, most farm crops, uh, um, can't last very

long. They're perishable, most of them and it's necessary that they get them to market as quickly as possible get them to the consumer. They put them aboard refrigerator-trucks, refrigerated rail cars, eh, refrigerated trucking facilities to get, um, get, um, to market as quickly as possible. Even in the supermarkets they have vast facilities to keep the lettuce, tomatoes, and what have you cool and, uh, that's the primary reason because they're perishable.

Sample Transcript - Sequence A

Posttest Question 1

How did the growth of factories affect the growth of cities?

How does the growth of factories affect the growth of cities? Well, people go where there are jobs available for them or they have good opportunities to find work. And where, uh, factories are built, they need a lot of people to take over the jobs in them, so people naturally migrate to places where there are jobs, that is where there're factories, so the more factories there are in one location the more people will be going there and eventually you will, uh, start to have, uh, big populations around this area. Now for example, um, it's possible that like ten years ago there would have been a city on the peninsula which wasn't even existing then, but by having industry coming in and having factories being built there, people naturally wanted to go there because they could find jobs and therefore, the community started to grow and there became a community there where there wasn't one before. So, um, factories are very important, in, um, affecting the growth of the city.

Sample Transcript - Sequence A

Posttest Question 2

Why did men first settle in river valleys?

Men first settled in river valleys because when, uh, most of the settlement of the world occurred it was people settled to farm. River valleys provide better land. One example is compare river valley to a desert where you have the water to irrigate your fields and, uh, keep the land rich. It's much worse where you don't have the water and you have to find some way of getting the water there. It's also, um, probably more pleasant climate to live in because when there is more water the air would be cooler and more enjoyable. Primarily it was because of the, the, ability it would give the people to farm and to do to have prosperous farming.

Sample Transcript - Sequence A

Posttest Question 3

Why is air pollution a greater problem now than in the past?

Air pollution is a greater problem now than in the past, uh, partly because of the growth of the country. There are more people who can create more air pollution and who can be more affected by air pollution. The cities are larger, there are more cities and there are, uh, more industry in the cities, because of the increase in size. And all these things combine to make the air more impure than it was twenty years ago. So basically, the reason that we have more, the reason that air pollution has a more serious problem, is because of the increase in population which can pollute the air and can be

affected by the pollution.

CODING MANUAL: CONTENT VALIDITY

I. INTRODUCTION

A. THE BEHAVIOR - The behavior is the degree to which the content of the explanation is related to the right answer. The ability of the explainer to develop a valid explanation is discussed in Lesson 3 of the "How to Explain" manual. Please refer to the manual and read the section on Validity, pp. 24-25.

B. CODING TASK - To rate the relative validity of the explanation and to underline, on the transcript, the statements that support or influence the rating.

II. RULES AND PROCEDURES

A. CONTENT VALIDITY

1. Content validity refers to whether or not the explanation is considered valid or accurate. In other words, is the explanation the <u>right</u> explanation.

2. You will make some judgments about the explanations you will be evaluating. Thus, it is necessary to determine what constitutes an adequate answer. Below are listed some aspects of each question that could go into a correct answer.

   a. "Why are good transportation facilities important to farmers?" A correct explanation could contain one or more of these concepts: (1) distance from market, (2) produce can be grown in one place but not another, (3) need to get perishable items to market, and (4) need to get equipment to farm.

b. "Why does climate affect the way prople dress?" The explanation could include one or more of the following concepts: (1) relationship of climate to temperature, (2) need to keep body at a proper operating temperature, (3) comfort, (4) relationship of clothing to temperature, and (5) health aspects.

c. "Why must we conserve our trees?" The explanation could include one or more of the following concepts: (1) time it takes a tree to grow, (2) beauty, (3) soil preservation, (4) difficulty to replace, (5) scarceness, (6) need for future, (7) provision of oxygen by trees, and (8) use of lumber in our economy.

B. SCORING

1. Not all of the concepts listed above will be found in a particular explanation. It will be your task to determine if the concepts expressed in a particular explanation are accurate or not, and if they answer the question adequately or not.

2. You will choose one of the following statements as your assessment of the explanation.

   a. States the right answer adequately. (RA)

   b. States right answer though not adequately. (RANA)

   c. States an answer that is sufficiently related to the right answer so it will not prevent the learner from understanding the right answer at a later time. (RAS)

d. States an answer that is not related to the right answer. (NRA)

e. States an answer that is wrong. (W)

C. PROCEDURES

1. Read through the explanation once, to get a feeling for the response, style, and idiocyncracies of the explainer.
2. Reread the explanation, this time (a) bracket those statements, phrases, or words that you feel support your contention that explanation is accurate and adequate (Place an "A" above the first bracket in this case), and (b) bracket those statements, phrases, or words that you feel support your contention that the answer is not adequate or accurate (place a "NA" above the first bracket in this case).
3. After you have examined and marked the explanation, record at the top of the transcript your assessment of the explanation (refer back to Scoring and use either RA, RANA, RAS, RNA, or W).

CODING MANUAL: LOGICAL ORGANIZATION

I. INTRODUCTION

A. THE BEHAVIOR - The idea of logical organization is drawn from Lesson 2 of the "How to Explain" manual. Lesson 2 (Structuring) discussed the logical organization of an explanation as it relates to the identification of the "things" involved, the relationship between these "things,", and the general principle involved. At this point, please refer to the "How to Explain" manual and read Lesson 2, pp. 9-19.

B. PURPOSE - To determine the degree to which the explainer has logically organized his material as defined by whether the explainer clearly indicates the "things", relationship, and general principle involved.

C. CODING TASK - To determine and clearly identify whether the explainer indicates the things, relationship and general principle in the explanation.

II. RULES AND PROCEDURES

A. DEFINITIONS

1. "Things" - The "things" in an answer are those concepts, variables, or ideas that the question deals with. For example, in the question, "How could pollution controls increase the price of a new automobile?" the main things are (a) pollution controls and (b) price of a new automobile. Another example might be, "Why does candy contribute to bacterial growth and tooth decay?" The main things are (a) candy and (b) bacterial growth and tooth decay.

2. Relationship - This refers to the relationship between the "things" in the question. To the question, "How could pollution controls increase the price of a new automobile?" The relationship between pollution controls and the price of a new automobile is that controls could increase the price. In the second example, "Why does candy contribute to bacterial growth and tooth decay?", the relationship between the things is that candy contributes to bacteria

and decay.

3. Principle - This refers to determining the broader concept involved in the relationship with which the question deals. Let's look at the two examples again and pick out the general principle. First, "How could pollution controls increase the price of a new automobile?" The general principle is that if something extra is added to a unit then the cost of that unit will increase in proportion to the cost of the addition. In the second question, "Why does candy contribute to bacterial growth and tooth decay?", the general principle is that certain kinds of food matter, such as that containing sugar, can help the growth of germs which can destroy healthy tissue. Notice that the general principle is more than a simple extension of the relationship.

B. CODING PROCEDURES

1. "Things" - Read the explanation to determine whether the explainer verbalizes the things in the question. Only code as "things" statements that show that the explainer is focusing on or clarifying the main "things" in the question. Do code statements such as, "What we are talking about here is pollution controls and the price of a new automobile," "Let's see, pollution controls and price of a new car," or "pollution controls and new car." Do not code as "things" statements which are simply part of the explanation, such as, "The price of a new car will increase when pollution controls ...," or "Pollution controls do increase the price of a new

car because..."

2. Relationship - Code as relationship only those statements that show that the explainer is clearly attempting to draw attention to the relationship between the things in the question. Do code as relationship such statements as, "We are talking about how controls could increase the price," or "The important aspect here is the increase caused by controls."

3. Principle - Code as principle only those statements that clearly indicate that the explainer is attempting to verbalize a higher principle than the simple relationship between the things in the question. Do code as principle such statements as, "In more general terms I think we are talking about increases determined by...," "Actually we are discussing the addition of extra materials which...," or "In another context we could say that additional components add to...."

C. PROCEDURES

1. Read the transcript carefully. Underline the section or sections that indicate to you that the explainer is verbalizing the "things" in the right margin opposite your underlining.

2. Once you have determined whether or not the "things" are present, re-read the explanation to determine if the relationship between these things are verbalized. If so, underline the statements you feel indicate this and write "Relationship" in the right margin.

3. Again, re-read the transcript to determine if a more general principle than the simple relationship is verbalized. If so, underline it and write "Principle" in the right margin.

D. SCORING

1. At the top of the transcript write:

Things

Relationship

Principle

2. Circle the ones that you found to be present in the explanation.

CODING MANUAL: LESSON DIVISIONS

I. INTRODUCTION

A. THE BEHAVIOR - Lesson divisions really focuses on two sections of the manual. The first section is Lesson 2 (Structuring) of the manual. Here, it is possible that the Structuring lesson could influence the development of clear divisions in the explanation. The second section is the section of Lesson 4 referring to how to summarize an explanation. At this point, please refer to the "How to Explain" manual and read Lesson 2, pp. 9-19, and Lesson 4, pp. 40-41.

B. PURPOSE - To discover, mark on the transcript, and rate for visibility the main divisions of the lesson (Introduction, Body, Summary).

C. CODING TASK - To identify the sentences where the introduction ends and the body begins, and where the body ends and the

summary begins.

II. RULES AND PROCEDURES

A. DEFINITIONS

1. An introduction may contain a variety of preliminary statements. For example, the explainer may state the general topic of the lesson, summarize the main ideas of the lesson, give background information, and so on.
2. The body of the lesson begins with the first point that is fully developed. Sometimes it will be marked by an expression such as, "The first point...," "To begin...," "Now the main idea is...," "We had better start by...," or similar phrases.
3. The body of the lesson ends when the last new piece of content has been completed and any remaining discourse consists of questions, summaries, repetitions, recapitulations, or the pronouncement that the lesson is over. Sometimes the teacher will say, "That concludes the main ideas (points, etc.)...," "I think we have the last point in hand...," "Now are there any final questions?" or "To summarize..." Sometimes there will be no verbal marker, only a summary statement. And sometimes the conclusion will consist simply of a statement that the lesson is over.

B. SCORING

1. If the lesson begins immediately with the first main point, score the Introduction zero.

2. If the introduction can be separated from the body only by careful reading that notes a change in direction, but the body is not verbally marked by any clear statement, score the Introduction "1".
3. If the introduction is clearly separated from the body by an expression that announces the first main point, score the Introduction "2".
4. If the summary occurs at the last sentence which develops the final point or consists merely of an announcement that the lesson is over, score the summary zero.
5. If the summary can be separated from the body of the lesson by careful reading that notes the beginning of repetition, summary, or review but is not marked by any clear statement, score the summary "1".
6. If the summary is clearly separated from the body by a statement that announces that the main ideas have all been disclosed and then goes on to prompt recall, review, or application of points in the lesson, score the summary "2".

C. PROCEDURES

1. First, skim through the answer noting, in the right-hand margin, where the introduction ends and the body begins. As a general rule, you will find that the body of the lesson begins when a first point in the actual answer of the question is dealt with. Read closely to assure yourself that such is the case, remembering that the body of the lesson begins with the first point that is substantially developed.

Mark the dividing point with a horizontal line extending into the left hand margin beneath the line of type that contains the end of the introduction. Write "Intro Ends" above the line you draw and record a score for the introduction according to the directions given on the basic instruction sheet.

2. When you have identified where the introduction ends, skim on through the rest of the answer, looking for the point where the explainer stops developing new content and turns instead to summary, review, and applications. Note, however, that summaries may occur periodically through the lesson and do not necessarily signal that the conclusion is beginning. Sometimes a major point will be thoroughly reviewed before the next new content is introduced. Usually, however, the teacher will announce that the body of the answer is over and that what follows is review. If any minor new information is introduced after that, either through a digression or the catching of an oversight, you may ignore that as unintentional and mark the "Summary Begins" where the explainer signals it. Mark the dividing point as you did the introduction's end, and score it according to the directions given on the basic instruction sheet.

CODING MANUAL: VERBAL EMPHASIS

I. INTRODUCTION

A. THE BEHAVIOR - Verbal emphasis refers to those teacher verbal behaviors that act to focus student attention on a subsequent

or foregoing point, idea, fact, concept, principle, distinction, etc., which is important to the answer. This behavior is drawn from the section of Lesson 4 in the "How to Explain" manual which discusses focusing attention on important points. Turn to pages 32-33 in the manual and read this section.

B. CODING TASK - The coding task is one of recognizing and coding all valid instances of this behavior, according to the rules and procedures outlined below.

II. RULES AND PROCEDURES

A. VERBAL MARKERS OF IMPORTANCE - These are words and phrases used by the explainer to mark the importance of a subsequent or preceding point, idea, fact, concept, etc., which is central to the lesson.

1. Code as VMI all instances in which the explainer uses any of the words and/or phrases identical or very similar to those listed in Section B below.

2. Due to variations in explainer's style, be careful not to overlook valid phrases that indicate importance. The list below does not exhaust the possible combinations of words that can indicate importance.

3. Although the list reflects the words and phrases often used to highlight importance, not all instances of these are used for this purpose. For example, you are not to code as VMI the following types of uses of words in the list: The condition of the dollar at that time was very critical." "He was a very profound man, and of prominent stature in this

critical area."

4. Do not code the words "one," "two," "first," "second," etc., when used as parts of an example or illustration. "Let's say we have <u>two</u> boys. <u>One</u> takes the high road and the <u>second</u> takes the low road."
5. You are to make no qualitative judgments as to the validity or legitimacy of drawing attention to a particular statement. If the explainer uses a VMI, it should be coded as such, irrespective of your notion of how really important the point is.
6. The explainer may use more than one focusing word, phrase, or clause for any one statement. In such instances each focus is coded independently of the others. The decision is made on the basis of whether or not the word, phrase, or clause would be coded if the other were not present. That is, it could stand by itself.

B. TYPICAL VERBAL MARKERS OF IMPORTANCE

1. <u>Words</u> - first, second, third, firstly, secondly, basic, basically, cardinal, central, chief, emphatic, essential, critical, crucial, fundamental, key, main, important, major, notable, principle, paramount, profound, primary, prime, salient, significant, vital, notice, remembers, exactly, etc.
2. <u>Phrases and Clauses</u> - The first point (fact, thing, concept, etc.), We start with, Next we come to, Now we must look at, I want to emphasize, I repeat, I can't state too strongly,

That is the whole point, What this all adds up to, I want you to remember, I want you to learn, I want you to understand, Try hard to get this, You should be thinking about, Don't forget that, That is the thing to know, etc.

3. Questions - Often timesan explainer will pose very brief questions which he answers himself. These tend to highlight a point, concept, relationship, etc. Examples of instances such as these are: "Why?", "So what happens", "What's the cause?", "What has to come next in this sequence?", "What is the key factor here?".

4. Repetition - Often times an explainer will emphasize a point, concept, relationship, etc., by repeating key words, phrases, clauses, or sentences nearly verbatim. The basic decision rule is that in order to qualify as a simple repitition, the word, phrase, clause, or sentence must be repeated nearly verbatim, i.e., with only minor changes in word composition or order.

C. SPECIAL PROCEDURES

1. Underline on the transcript all instances of verbal emphasis which you identify.

2. Read each line, sentence, and statement very carefully in order not to overlook valid instances of this behavior. As you finish reading each explanation, reread it to be sure that nothing has been overlooked and that those you have coded are valid instances of the behavior.

3. Do not count habitual words and phrases such as okay, now, all right, however, well, right, good, etc.
4. At the top of the transcript write the number of verbal emphases that you identified in the explanation.

CODING MANUAL: RULE-EXAMPLE-RULE

I. INTRODUCTION

A. THE BEHAVIOR - Rule-example-rule refers to a pattern which presents a structuring statement first, follows it with details, and concludes with a structuring statement. The rule-example-rule pattern is discussed in Lesson 4 of the "How to Explain" manual. Please refer to the manual and read the section on rule-example-rule, pp. 33-35.

B. CODING TASK - To classify each example or example series as having Rule Before and After, Rule Before only, Rule After only, or No Rule.

II. RULES AND PROCEDURES

A. EXAMPLES - Examples are generally signalled by such expressions as "for example", "for instance", "an example is", "A case in point would be...," and the like. Examples are not always so easily identified for an example can serve many purposes, as the following passages will illustrate.

1. To expand a definition.

"...foreign materials in the atmosphere can be called air pollution. Examples of air pollution would be smoke coming out of the back of automobiles, and burned wastes coming out of factories, incinerators, and fireplaces."

2. To make an abstract term concrete.

"...so the farmers need different types of transportation to get their goods to market. Some of these different types of transportation that are useful to the farmer are hauling tractors, large trucks, and railroad boxcars and flatcars."

3. To make a general case specific.

"The supply could go down. Say that we found a brand new use for trees. Well, maybe a fantastic demand for wooden ear plugs or something absurd. We know what would happen, all the trees would go into making wooden ear plugs. This would leave us fewer trees than before and therefore more valuable and expensive."

4. To illustrate a generalization.

"And secondly, factories help population growth. If a factory is successful and expands then it will need more workers. The increased workers will need increased services such as housing, clothing, and marketing facilities. In this way more and people are added to the existing population."

5. To illustrate a principle.

"Basically what we are talking about here is the principle of growth. By growth we mean that a factory expands, gets larger, increases output."

B. RULE - A rule is a statement which summarizes a series of illustrations and which is stated at a higher level of generalization than the illustrations. Typically, a rule makes an assertion about something most often in the form of a generalization or principle.

1. A conclusion-drawing statement may be coded as a rule. Such statements may contain "thus," "therefore," "how," or "so." Such as, "This is how they hope to preserve world peace," or "So this is the second part of their foreign policy."
2. A sentence can be coded as a rule even if the rule is not the main point of the sentence. In the sentence, "In addition to this policy, they also feel that trees should be saved for beauty's sake," the phrase "this policy" indicates that the preceding illustrations are examples of a policy. Therefore, the phrase "this policy" is an instance of a rule. If the word "this" were used alone, no rule would be counted.
3. To qualify as a rule, a statement must occur within three or four lines of the first or last illustration.

C. CODING PROCEDURES

1. Examples - All examples will be marked on a reading of the transcript. Mark the examples by underlining them in pencil. If an example takes more than one line, bracket all the lines that are included.
2. Rule-Example-rule - Find the first example marked on the transcript and scan the section around it. If a rule occurs ahead of the example, write "Rule Before" in the left hand margin opposite the statement of the rule. Bracket the passage of the text that contains the rule.

If a rule occurs after the example, write "Rule After" in the left hand margin opposite the statement of the rule and bracket the appropriate section of the text. Locate each successive example or series of related examples and follow the same procedure. You will find cases in which the rule occurs both before and after, only before, only after, and not at all. Most of the cases in which no rule can be found, the example will refer to a single word or short phrase coming before it that cannot qualify as a rule. To help yourself in scoring, you may wish to write "no rule" wherever one might occur but does not.

D. SCORING

After you have examined and classified each example as having rules preceding and/or following or having no rules at all, count and record on the Coding Sheet the number of cases falling in each of the following categories:

1. Rule Before and After
2. Rule Before only
3. Rule After only
4. No Rule

Note: On this coding we will not be concerned with cases of Rule Only. Deal only with examples already marked on the transcripts.

SAMPLE VAGUENESS DICTIONARY

all of this
all this
and other
and others
and so forth
and so on
and things
another thing
any kind
any other
any particular
any place
any time
any where
anything
anytime
aspect
all of them
different things
et cetera
etc
no particular
not any
not anything
or another
or other
other one
other people
other thing
same thing
same way
somebody
somehow
someone
something
sometime
somewhere
stuff
they say
type of thing
aren't necessarily
are not necessarily
can't really
cannot necessarily
cannot really
can't necessarily
doesn't necessarily
isn't necessarily
is not necessarily
isn't really
is not really
not absolutely
not all
not always
no as
not at all
not definitely
not entirely
not every
not everybody
not everyone
not many
not most
not necessarily
not particularly
not positively
not quite
not really
not specifically
not strictly
not so
not too
not usually
not very
not without
not withstanding
not often
not infrequently
not so many
not so much
not so very
not hardly
not especially
not involve
not involved
wasn't too
was not too
won't necessarily
about as
about the same
amounts to
almost
almost all
almost every
almost everyone
has kind of
is kind of
just about
just kind of
kind of a
half way
in a way
kind of
kind of like
kinda
largely
less than good
mainly
near to
nearly
not as
nearly all
nearly every
practically

APPENDIX D

TABLES FOR STATISTICAL ANALYSES OF RATED AND CODED DIMENSIONS

Analysis of Covariance Tables for Student Ratings of Organization, Clarity, and Quality Dimensions

Analysis of Variance Tables for Coded Content Analysis Dimensions

Analysis of Covariance for Means of Experimental and Control Posttests on Organization, Clarity, and Quality Dimensions

Source	Sum of Squares	df	Mean Square	F
ORGANIZATION DIMENSION				
Between Experimental and Control Groups (E)	2225.61	1	2225.61	22.73**
Between Sequence Groups (S)	104.24	1	104.24	1.06
Interaction (ExS)	279.90	1	279.90	2.86
Covariance Regression Test	1474.37	1	1474.37	15.06**
Error	5385.90	55	97.93	

Source	Sum of Squares	df	Mean Square	F
CLARITY DIMENSION				
Between Experimental and Control Groups (E)	3326.58	1	3326.58	33.14**
Between Sequence Groups (S)	326.60	1	326.60	3.25
Interaction (ExS)	291.78	1	291.78	2.91
Covariance Regression Test	2365.50	1	2365.50	23.57**
Error	5520.10	55	100.37	

Source	Sum of Squares	df	Mean Square	F
QUALITY DIMENSION				
Between Experimental and Control Groups (E)	3218.56	1	3218.56	28.65**
Between Sequence Groups (S)	142.18	1	142.18	1.27
Interaction (ExS)	220.83	1	220.83	1.97
Covariance Regression Test	2106.92	1	2106.92	18.75**
Error	6179.34	55	112.35	

**Significant at the .01 level.

Analysis of Variance Tables for Means of Experimental and Control Groups Ratings on All Content Analysis Dimensions

Source of Variation	Sum of Squares	df	Mean Square	F
Content Validity				
Between Experimental and Control Groups (E)	16.00	1	16.00	22.50**
Between Topics (T)	0.22	2	0.11	0.16
Interaction (ExT)	0.67	2	0.33	0.47
Error	21.33	30	0.71	
Total	38.22	35		
Logical Organization - Things				
Between Experimental and Control Groups (E)	2.78	1	2.78	16.67**
Between Topics (T)	0.23	2	0.11	0.00
Interaction (ExT)	0.22	2	0.11	0.67
Error	5.00	30	0.17	
Total	8.23	35		
Logical Organization - General Principle				
Between Experimental and Control Groups (E)	0.11	1	0.11	1.00
Between Topics (T)	0.56	2	0.28	0.25
Interaction (ExT)	0.56	2	0.28	0.25
Error	3.33	30	0.11	
Total	4.56	35		
Logical Organization - Relationship				
Between Experimental and Control Groups (E)	0.69	1	0.69	4.63*
Between Topics (T)	0.39	2	0.19	1.30
Interaction (ExT)	0.56	2	0.28	0.18
Error	4.50	30	0.15	
Total	6.14	35		
Verbal Emphasis				
Between Experimental and Control Groups (E)	20.25	1	20.25	17.28**
Between Topics (T)	15.17	2	7.58	6.46
Interaction (ExT)	2.17	2	1.08	0.92
Error	35.17	30	1.17	
Total	72.76	35		

** Significant at .01 level; * significant at .05 level

Analysis of Variance Tables for Means of Experimental and Control Groups Ratings on All Content Analysis Dimensions

Source of Variation	Sum of Squares	df	Mean Square	F
Rule-Example-Rule: Examples with Rules Before and After				
Between Experimental and Control Groups (E)	0.69	1	0.69	2.19
Between Topics (T)	2.06	2	1.03	3.25
Interaction (ExT)	0.72	2	0.36	1.14
Error	9.50	30	0.32	
Total	12.97	35		
Rule-Example-Rule: Examples with Rules Before				
Between Experimental and Control Groups (E)	0.11	1	0.11	0.32
Between Topics (T)	0.22	2	0.11	0.32
Interaction (ExT)	0.22	2	0.11	0.32
Error	10.33	30	0.34	
Total	10.88	35		
Rule-Example-Rule: Examples with Rules After				
Between Experimental and Control Groups (E)	0.028	1	0.028	0.38
Between Topics (T)	0.17	2	0.08	1.15
Interaction (ExT)	0.39	2	0.19	2.69
Error	2.17	30	0.072	
Total	3.01	35		
Vagueness				
Between Experimental and Control Groups (E)	0.0100	1	0.0100	31.90**
Between Topics (T)	0.0037	2	0.0018	5.78
Interaction (ExT)	0.0044	2	0.0022	6.92
Error	0.0095	30	0.0003	
Total	0.0276	35		
Anaphoric References				
Between Experimental and Control Groups (E)	.036	1	.036	7.72**
Between Topics (T)	.003	2	.001	2.58
Interaction (ExT)	.006	2	.003	.60
Error	.014	30	.005	
Total		35		

** significant at .01 level

Analysis of Variance Tables for Means of Experimental and Control Groups Ratings on All Content Analysis Dimensions

Source of Variation	Sum of Squares	df	Mean Square	F
Total Words				
Between Experimental and Control Groups (E)	16641.00	1	16641.00	21.51**
Between Topics (T)	2510.72	2	1255.36	1.62
Interaction (ExT)	234.48	2	117.24	0.15
Error	23219.19	30	773.64	
Total	42605.39	35		
Total Sentences				
Between Experimental and Control Groups (E)	81.00	1	81.00	30.50**
Between Topics (T)	1.39	2	0.69	0.26
Interaction (ExT)	8.17	2	4.08	1.54
Error	79.67	30	2.66	
Total	170.23	35		
Rule-Example-Rule: Examples Only				
Between Experimental and Control Groups (E)	2.78	1	2.78	8.33**
Between Topics (T)	0.72	2	0.36	1.08
Interaction (ExT)	0.39	2	0.19	0.58
Error	9.99	30	0.33	
Total	13.88	35		
Introduction: Frequency and Visibility				
Between Experimental and Control Groups (E)	0.25	1	0.25	1.04
Between Topics (T)	0.06	2	0.03	0.11
Interaction (ExT)	0.17	2	0.08	0.35
Error	7.17	30	0.24	
Total	7.65	35		
Summary - Frequency				
Between Experimental and Control Groups (E)	3.36	1	3.36	20.86**
Between Topics(T)	0.17	2	0.08	0.52
Interaction (ExT)	0.39	2	0.19	1.21
Error	4.83	30	0.16	
Total	8.75	35		

** significant at .01 level

Analysis of Variance Tables for Means of Experimental and Control Groups Ratings on All Content Analysis Dimensions

Source of Variation	Sum of Squares	df	Mean Square	F
Summary - Visibility				
Between Experimental and Control Groups (E)	10.03	1	10.03	20.28**
Between Topics (T)	0.50	2	0.25	0.51
Interaction (ExT)	1.39	2	0.69	1.40
Error	14.83	30	0.49	
Total	26.75	35		

** significant at .01 level

APPENDIX E

QUESTIONNAIRES FOR "HOW TO EXPLAIN" MANUAL

Lesson 1 Questionnaire - Objective
Lesson 1 Questionnaire - Subjective
Lesson 2 Questionnaire - Objective
Lesson 2 Questionnaire - Subjective
Lesson 3 Questionnaire - Objective
Lesson 3 Questionnaire - Subjective
Lesson 4 Questionnaire - Objective
Lesson 4 Questionnaire - Subjective
Lesson 5 Questionnaire - Objective
Lesson 5 Questionnaire - Subjective

Questionnaire for Practice Sessions

Practice Session 1 - Objective
Practice Session 1 - Subjective
Practice Session 2 - Objective
Practice Session 2 - Subjective
Practice Session 3 - Objective
Practice Session 3 - Subjective
Practice Session 4 - Objective
Practice Session 4 - Subjective
Practice Session 5 - Objective
Practice Session 5 - Subjective

Final Questionnaire

Objective
Subjective

LESSON 1 QUESTIONNAIRE - Objective Section

1. Do you feel that you better appreciate the importance of listening skills after reading Lesson 1?

*97% Yes
3% No

2. Do you feel that Lesson 1 would improve the performance of a teacher?

73% Yes
3% No
23% Don't know

3. Do you feel that the organization of your spoken statements will be more effective as a result of this lesson?

63% Yes
13% No
23% Don't know

4. In general, do you feel that this lesson has improved your listening skills?

87% Yes
13% No

5. Which term below do you feel best describes the teaching level of this lesson?

7% Too easy
30% Easy
63% Suitable
0 Difficult
0 Too Difficult

6. How successful do you think Lesson 1 is as a teaching method?

53% I learned more about listening than I could have learned from a teacher in the same amount of time.
43% I learned about the same as I would have learned from a teacher in the same amount of time.
3% I learned less about listening than I would have learned from a teacher in the same amount of time.

7. The exercise in Lesson 1 was:

3% Too Easy
20% Easy
70% Suitable
7% Difficult
0 Too Difficult

*Represents percentage of 30 subjects checking particular answer.

LESSON 1 - QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about Lesson 1 that you particularly liked?

- I enjoyed listening to the radio-talk programs. I feel I will be more aware of the question.

- The overall lesson is good. The exercises were very practical I thought.

- Yes. Rephrasing the question not only clarifies what is being asked, but also makes the student think about the way he asked the question.

- Yes, it made me listen better.

- In this lesson, I particularly like the clear-cut explanation made about listening and its importance as the very first step in the development of a good explanation. An appropriate and excellent example of a good listener was given together with every possible technique he uses as an exemplary listener.

- I enjoyed listening to the radio because I could hear for myself just exactly what was being discussed in Lesson 1.

- It stressed an often sadly neglected aspect of a teacher's function, the art of listening to a student carefully.

- I liked being left on my own to listen to and work with the questions until I felt I understood them.

- The manual was clear and definite as to what Lesson 1 entailed. The exercises gave you an opportunity to put into practice Lesson 1.

- The questions increased in difficulty of sentence structure and complexity of concepts.

- Yes. I think the alternatives given for understanding a question, e.g., repeat question, rephrase question, and ask if that's right helped me recognize the different ways to clarify your thoughts, without appearing mute and uncertain. Also exercises are good reinforcement.

- It was concisely stated -- with adequate example.

- I liked the example of the talk show because now I'll be more aware of the announcer's listening skills as well as my own.

- Yes. In simple and direct wording it focuses on a skill of prime importance to the classroom teacher.

- When you stop to listen carefully to a question and understand it fully you can gather information for your response instead of throwing statements out.

- This lesson re-affirms my opinion that most people don't listen to each other, even in ordinary conversation.

- I thought the exercises were very effective, they were a very practical follow-up for that lesson.

- Yes. The use of the radio and the exercise to introduce practical application. Doing, for me, is far better than being told about doing.

- Having eye contact with the questioner.

- Did force me to listen and understand. There is almost always more than one way to interpret what is meant by the asker.

- I enjoyed "listening" to the questions with this different aspect in mind.

- I liked the lesson itself and how it drew attention to listening more to the question than preparing the answer. The exercise of listening to a talk show was interesting and helpful.

- Use of boxes around main ideas. Good organization of material.

QUESTION 2: Was there anything about Lesson 1 that you particularly disliked?

- It did not have enough "meat" on the "bones" of the suggestions.

- Rather than dislike, I feared the questions asked at the end of the lesson. My ignorance of some of the topics made it difficult for me.

- The suggestion for listening to TV and radio talk shows can be difficult for those of us with families if there is a limited period of time. However, since this is a continuing skill, this listening practice can be extended over a long period of time.

- It was difficult to find an appropriate radio talk show. Most people call in to such shows with opinions, not questions.

- Listening to talk shows. Felt they manipulated the questioner rather than listening.

- Questions of only one type - out of context of any other conversation which is always a clue to the meaning of the question. Seems like both types would give broader spectrum of what to expect.

- I thought that some of the questions were difficult to follow perhaps only because I didn't have suitable answers.

QUESTION 3: Use the space below for any other comments which you may have regarding the lesson.

- The prescribed exercises at the end of the lesson are very appropriate, suitable, and practical to acquire the skill of good listening which is the whole idea of this lesson.

- The feeling that learning techniques of listening, comprehending, evaluating, and explaining are very important to a teacher. Communication of and correct transfer of thoughts are very important. Many very learned men make poor teachers because they are unable to help the student learn new concepts.

- It seems to have been unchallenging.

- I thought the lesson was useful because it made me aware of the fact that hearing is not necessarily listening.

- I have to admit that at first glance I thought this lesson was quite easy. However, after doing it I had to admit that it contained very essential facts regarding the skills of listening.

- Despite the fact that I'm sure most of us have "heard" this before, it is valuable to be made consciously aware of the techniques.

- What about the student who has a question, but cannot express it? Even repeating the question for him or mentioning the high points doesn't help in understanding what he is asking. How can a bridge of communication be created in such a situation?

- More than anything else it promoted the importance of listening acutely to questions and the realization that questions can be easily misunderstood.

- Probably don't understand the program yet. Doesn't seem like out of context questions relate very much to actual classroom situation. I do appreciate this much concentration on a subject worth thinking about.

- More work could be done with the art of asking questions to clarify the meaning of the original question.
  a) What are the specific elements of vague interrogation?
  b) Some talk shows aren't worth a damn - this seems like a secondary authority for the student than a primary one.
  c) How about a Socratic dialogue to illustrate proper definition of a question?

LESSON 2 QUESTIONNAIRE - Objective Section

1. Do you feel that you better appreciate the importance of structuring after reading Lesson 2?

   *90% Yes
   10% No

2. Do you feel that Lesson 2 would improve the performance of a teacher?

   83% Yes
   0 No
   17% Don't Know

3. Do you feel that the organization of your spoken statements will be more effective as a result of Lesson 2?

   53% Yes
   13% No
   33% Don't Know

4. In general, do you feel that this lesson has improved your skills in identifying?

"Things"	Relationships	Principles
80% Yes	83% Yes	73% Yes
20% No	17% No	27% No

5. Which term below do you feel best describes the teaching level of this lesson?

   0 Too Easy
   13% Easy
   63% Suitable
   23% Difficult
   0 Too Difficult

* Represents percentage of 30 subjects checking particular answer.

6. How successful do you think Lesson 2 was as a teaching method?

47% I learned more than I would have from a teacher in the same amount of time.
33% I learned about the same as I could have from a teacher in the same amount of time.
20% I learned less than I could have from a teacher in the same amount of time.

7. The exercises in Lesson 2 were:

0 Too Easy
10% Easy
60% Suitable
30% Difficult
0 Too Difficult

LESSON 2 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about Lesson 2 that you particularly liked?

- I thought the "general principle" exercises were very helpful.

- It has taught me how to pick the important points out of each statement much more quickly.

- I particularly like the questions asked in the drill exercise, so much so that they're just suitable to the lesson, and thus, I've learned more about it.

- I liked the organization of the material.

- I liked the number of exercises. Two or three of each would not have been enough.

- The exercises.

- Lots of problems to work - reinforcing the material presented.

- I was better able to understand the importance of structuring and organization of what a teacher says.

- 1) Integrating all three steps into one exercise as they were introduced. 2) Develop an awareness of the necessity of "thinking" before answering a question if one wants to be effective.

- It helped me to understand the different segments of a question and really how to break questions down to get to the "meat" of what was being questioned.

- The explanations prior to the exercises were very precise and clear.

- The exercises started with the familiar and went from there.

- I liked the lesson. It was something that was more or less a review but something often forgotten.

- Good organization.

- The way the exercise was set up in three parts.

QUESTION 2: Was there anything about Lesson 2 that you particularly disliked?

- How to ascertain correct principle was not clearly understood.

- It was difficult for me to discuss exactly what was to be included in the "general principle" category. I found myself trying to formulate specific answers -- not general principles.

- I feel more examples could have been used for the discussion of "relationships" -- or at least one from the previous lesson on things (others that would have shown in a similar light). It probably was sufficient although I had to reread the articles three times.

- I found it difficult to put into words the general principle involved.

- Verbal explanation would help at this point.

- There was no help when I needed it. The principle part left me confused and unsure of exactly what I should do and what was expected.

- Would like a better explanation of general principle.

- Principle is the "key" to entire program. Why treat it so lightly?

- I didn't think there was enough explanation for picking things, relationship, or principle.

- The exercises were a little confusing as I wasn't sure about general principles. Not sure exactly what was wanted.

QUESTION 3: Use the space below for any other comments which you may have regarding the lesson.

- I would have liked additional help on the "general principle" exercises in order to know whether or not I was handling it correctly.

- I am not sure I was able to clearly state the general principle so I hope we go over this in class or have more practice.

- I would have liked more help with the principle behind the question.

- I have never had any training of this sort. I see the importance of it in the training of teachers -- or persons in general -- this training could and should be done early in the education process for the greatest benefit to all.

- This was really enlightening. It would be nice to have some feedback from someone to help sort out the answers to problems I was unsure of.

- The exercises were suitable to concepts being developed, though I found identifying the general principle a challenge. The "do-it-yourself" manual approach plus practice seems to me to be far more effective and also increases the student's awareness of the steps involved for effective explaining to a much higher degree than a teacher lecturing.

- I was not really sure of what the principle would be in any question. I feel as this lesson might have confused my ability to understand and interpret questions rather than help it.

LESSON 3 QUESTIONNAIRE - Objective Section

1. After reading Lesson 3 do you feel you better appreciate the importance of:

Application	Validity	Simplicity	Clarity
* 93% Yes	77% Yes	80% Yes	80% Yes
7% No	23% No	20% No	20% No

2. Do you feel that Lesson 3 would improve the performance of a teacher?

77% Yes
0 No
23% Don't Know

*Represents percentage of 30 subjects checking particular answer.

3. Do you feel that the organization of your spoken statements will be more effective as a result of Lesson 3?

73% Yes
17% No
10% Don't Know

4. In general, do you feel that this lesson has improved your skill in developing:

Application	Validity	Simplicity	Clarity
80% Yes	73% Yes	87% Yes	87% Yes
20% No	27% No	13% No	13% No

5. Which term below do you feel best describes the teaching level of this lesson?

7% Too Easy
3% Easy
73% Suitable
17% Difficult
0 Too Difficult

6. How successful do you think Lesson 3 was as a teaching method:

30% Learned more than from a teacher in same amount of time.
53% Learned same as from a teacher in same amount of time.
12% Learned less than from a teacher in same amount of time.

7. The exercises in Lesson 3 were:

3% Too Easy
0 Easy
80% Suitable
17% Difficult
0 Too Difficult

LESSON 3 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about this lesson that you particularly liked?

- This lesson has an appeal to me because of its organization and it was made simple and clear for one to understand. Its ends are achieved through excellent means which are the exercises.

- The exerpt on validity and simplicity was very well written.

- I like working on the question used before in order to use thoughts not used before and improve the general outline of the answer.

- Finally we came to clarity. I thought it was the most important. That is why we answer questions after all.

- The stress on simple language. The illustrations.

- I again felt the explanations were well written and easy to understand and grasp. I think I have a very simple mind and like things short and to the point.

- The examples.

- There was enough space to write answers. The terms were carefully defined.

- "Thinking" was necessary.

QUESTION 2: Was there anything about this lesson that you particularly disliked?

- It would be helpful if some kind of sketch answer was given for Lesson 3 to help check for clarity, etc.

- The exercises were confusing.

- Not enough examples in last three areas. Too many things attempted at once; not enough time to concentrate on each.

- More explanation and examples are needed to translate the general principle to the relationship into a verbal explanation. The need for validity, simplicity, and clarity is already obvious.

- I found it hard and confusing to put the principle into application.

QUESTION 3: Use the space below for any other comments which you may have regarding the lesson.

- I am conscious that I need these speaking and writing skills so these exercises were beneficial for me.

- I disliked the validity section because I still have questions: What if I don't know the answer? What if the student said one thing but meant another, or is mistaken? ("Why are pearls found in South Africa?") How do I translate a question to make it answerable?

- I would like some comparison and criticism of my answers.

- Could use help in formulating clear, simple, answers. This is a big problem going from college to public schools.

- It seemed to me that I was doing the same thing in the Lesson 3, 1st exercise, as I did in the last exercises of Lesson 2. This leads me to believe that I don't understand the general principle and its application, although I can appreciate its importance.

- I think I would like to have the general principle explained again.

- I still have trouble with the principle part. Also, how can all these steps be handled in the time it takes to answer a student's question.

- More time should have been given to applying the general principle to our explanations rather than belaboring the portion on clarity.

LESSON 4 - QUESTIONNAIRE - Objective Section

1. After reading Lesson 4 do you feel that you better appreciate the importance of:

Focus	Rule-Example-Rule	Vagueness	Summarizing
*97% Yes	90% Yes	87% Yes	87% Yes
3% No	10% No	13% No	13% No

2. Do you feel that Lesson 4 would improve the performance of a teacher?

80% Yes
0 No
20% Don't Know

3. Do you feel that the organization of your spoken statements will be more effective as a result of Lesson 4?

67% Yes
7% No
27% Don't Know

4. In general, do you feel that this lesson has improved your skill in developing:

Focus	Rule-Example-Rule	Vagueness	Summarizing
87% Yes	77% Yes	77% Yes	83% Yes
13% No	23% No	23% No	17% No

5. Which term below do you feel best describes the teaching level of this lesson?

7% Too Easy
0 Easy
87% Suitable
3% Difficult
3% Too Difficult

6. How successful do you think Lesson 4 was as a teaching method?

50% I learned more than I could have from a teacher in the same amount of time
37% I learned about the same as I could have from a teacher in the same amount of time.
13% I learned less than I could have from a teacher in the same amount of time.

7. The exercises in Lesson 4 were:

0 Too Easy
10% Easy
77% Suitable
7% Difficult
7% Too Difficult

LESSON 4 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about this lesson that you particularly liked:

- I was better able to go about making my statements clear and to the point.

- I particularly like the exercises prescribed in the lesson. They were very suitable and excellent opportunities for practice as an application of the lesson.

- I could see the development of a good explanation in this lesson.

- I agree with the emphasis on the over-use of superfluous words in explanations.

- Becoming aware of the elements and fine points of a good explanation.

- The lesson did clarify the principle - its use.

- I liked rephrasing what I had previously stated. It gave me more to think about in the presentation of an explanation.

- Rule-example rule and when it can be applied.

QUESTION 2: Was there anything about this lesson that you particularly disliked?

- There is need for better directions on the assignments.

- Explanation of rule-example-rule confusing. Not quite sure I understand it completely. I don't believe it can be applied often.

- It gets a little monotonous explaining the same thing over. I would have preferred answering a new question from scratch.

- Too much covered. Not enough detail on material covered.

- Too repetitious by answering the same questions.

- Felt rewriting the answers I was losing simplicity and clarity.

- Too repetitious.

- I didn't understand the rule-example-rule and as usual didn't have any help.

- Although rephrasing was a good point, I found myself at a loss for different words and tended to lose simplicity.

QUESTION 3: Use the space below for any other comments which you may have regarding the lesson.

- I find it difficult to incorporate the rule-example-rule principle in most of the questions available.

- There is a great need for more and better examples in this section. The part about vagueness is far better than the clarity chapter in Lesson 4. Much more applicable.

- The explanations made were excellent and they were well organized. Every point was made simple and clear.

- This is very helpful to all people but especially to future teachers.

- In the exercise for the rule-example-rule pattern, you asked us to take the questions previously answered in #3 and apply this principle. This principle works well with a great deal of questions but not effectively with some. I ended up using the two questions I had worked orally in practice session #3 and I found this to be a good reinforcement. Maybe you could designate in the exercises for the person to apply whatever principle being studied to these questions he worked with that day at the practice session. In retrospect, you gain from your errors.

- Regarding questions 2, 3, and 4 -- the skills involved are improved by the written practice and by studying and becoming aware of the problems involved. For me, however, I find the oral and more extemporaneous practice sessions with the tape recorder even more advantageous. I find that I take a great deal of time organizing my response when I'm writing the answers. This makes me a bit uneasy as I do it because I realize that I would have mayhem or an empty classroom if I took 15 or 20 minutes to organize my response to a question. Could or should a time limit be imposed by the individual when doing the exercises to get a more realistic response?

- About this time I would like to get together with the total group and summarize main points. I have the uneasy feeling that I'm taking some things for granted that I shouldn't be.

- Did not find the explanation of rule-example-rule clear.

LESSON 5 QUESTIONNAIRE - Objective Section

1. Do you feel you can better develop a complete explanation after reading Lesson 5?

   *83% Yes
   17% No

2. Do you feel that Lesson 5 would improve the performance of a teacher?

   67% Yes
   13% No
   20% Don't Know

3. Do you feel that the organization of a complete explanation will be more effective as a result of Lesson 5?

   80% Yes
   7% No
   13% Don't Know

4. In general, do you feel that this lesson has improved your skill in developing a complete explanation?

   83% Yes
   17% No

5. Which term below do you feel best describes the teaching level of this lesson?

   3% Too Easy
   7% Easy
   90% Suitable
   0 Difficult
   0 Too Difficult

6. How successful do you think Lesson 5 was as a teaching method?

50% I learned more than I could have from a teacher in the same amount of time
30% I learned about the same as I could have from a teacher in the same amount of time.
20% I learned less than I could have from a teacher in the same amount of time.

7. The exercises in Lesson 5 were:

3% Too Easy
0 Easy
87% Suitable
7% Difficult
3% Too Difficult

LESSON 5 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about this lesson that you particularly liked?

- Concise review of principles used this past week.

- I am learning better how to organize my thoughts in a concise and clear manner.

- I do sincerely think that the way the whole set-up and organization of this lesson and the manual as a whole is excellent, especially in the way of how it achieves its goal of developing the skill of explaining in a beginning teacher most especially.

- Using the same questions and relatively simple ones made it easier to develop an explanation using the points discussed.

- I liked being able to construct a complete answer of my own.

- This series can be very helpful. I'm sure I can use more practice.

- Good examples.

- Reviewing and putting together the various sections.

- The example of a complete explanation was very helpful. Lesson 5 was good example of a summary. It effectively reviewed everything we have learned.

- Exercises.

*Represents percentage of 30 subjects checking particular answer.

- The summary of the steps.

- It was a good concluding lesson to tie all the ends together.

- I liked the way everything was explained in the example before going on to the explanation. Just with that outline of the main things, relationship, and general principle the whole week's lessons fell into place. Because of that I can finally understand what had me so confused all week.

QUESTION 2: Was there anything about this lesson that you particularly disliked?

- Writing questions. It is much more difficult and useful to practice answering someone's question.

- Felt that question #3 was difficult to answer for two reasons.
  1) Would like qualifications which would limit the questions.
  2) In my own mind cooperation between individuals is obvious.

- The questions that had to be answered at the end.

- I'm sick of questions.

QUESTION 3: Use the space below for any other comments which you may have regarding the lesson.

- The lesson was suitable, but I need more practice to feel confident as to the effectiveness of my explanations.

- Good course! Very helpful in presenting materials to students as well as in answering questions by students.

- This all seems to have helped me personally to organize my thoughts and since I consider it a very important task to answer questions well - it had been a big help. I would like to have had it more directed to specific age levels with perhaps a videotape of a real classroom situation - to see how kids reacted to different answers. It was, however, a very relevant unit.

- It was a good culminating lesson and I feel it did a good job of bringing all the main points together!

- Thanks for the postscript and bibliography.

- All the lessons put together seem to make an explanation the beginning of a lecture. I would have preferred a more compact lesson plan with left over time used to practice methods of involving students. Certainly helped me focus on main points though.

- Too long and drawn out. Programmed structure was a good idea.

PRACTICE SESSION 1 QUESTIONNAIRE - Objective Session

1. Do you feel that you better appreciate the importance of listening skills after completing the course?

*100% Yes
0 No

2. Do you feel that this course would improve the performance of a teacher?

93% Yes
0 No
7% Don't Know

3. Do you feel that the organization of your spoken statements will be more effective as a result of this course?

60% Yes
13% No
27% Don't Know

4. In general, do you feel that this course has improved your listening skills?

100% Yes
0 No

5. Which term below do you feel best describes the teaching level of this course?

0 Too Easy
10% Easy
73% Suitable
17% Difficult
0 Too Difficult

6. In which of the following categories do you feel the course will provide the greatest improvement to your listening skills? (Check one)

0 Didn't help at all
70% Listening to all statements
3% Listening to general business statements
27% Listening to statements centering around a particular product or course of action

7. Before taking this course, were you able to adequately summarize spoken remarks as the speaker proceeded?

40% Yes
60% No

*Represents percentage of 30 subjects checking particular answer.

8. Were you able to summarize a speaker's remarks as he proceeded after taking this course?

97% Yes
3% No

9. How successful do you think audio-programmed instruction is as a teaching method?

70% I learned more about listening than I could have learned from a teacher in the same amount of time.
27% I learned about the same as I would have learned from a teacher in the same amount of time.
3% I learned less about listening than I would have learned from a teacher in the same amount of time.

10. Ho do you like audio-programmed instruction?

10% Less than the regular classroom method
23% The same as the regular classroom method
67% More than the regular classroom method

PRACTICE SESSION 1 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about the "Listening" program that you particularly liked?

- I found the organization aspect of picking out main points and supporting arguments especially helpful in improving listening.
- We were forced to concentrate on the spoken word.
- Organizing main points in mind while speaker elaborates.
- The varied types of speech and background noise.
- Made me listen more closely.
- The exercises provided are very suitable and practical for the achievement of what is aimed for.
- Variety of topics.
- Variety -- rapidity of learning experience.
- The actual practice in listening is valuable.
- The variety of listening skills to practice.
- The different types of voices made it evident that one must listen carefully.

- It really made me aware of my own tendency not to listen well.

- Variety of examples.

- It gave examples of people speaking in different situations, noisy backgrounds, under emotional strain, etc.

- The challenge -- awareness of need after listening once or twice.

- Very clear and concise points.

- The program was varied. It seems like it would be good for students to take in college as it would be an advantage in notetaking.

- Challenging. Taught to be concise in summarizing.

- Many different areas covered not just one field. This kep people alert.

QUESTION 2: Was there anything about the "Listening" program that you particularly disliked?

- Some of the speakers were hard to understand.

- Too long. Became tediously repetitious; content of little or no interest, although this emphasized the points learned.

- Too long.

- Hard to understand.

- Tape was fuzzy at times.

- An hour is a long time to listen intently to questions.

- Repetition of announcer - but not too bad.

- At first the voices were not clear enough.

- As a new skill, perhaps a minute or five break after the first 30 minutes would help.

- Not always able to understand what was being said.

- Too lengthy. Boring in places. I had to force the last few parts. Could achieve the same effect in a shorter lesson.

- Too long.

- Too much repetition of instructions. Should include statements that weren't so organized.

- I found it very difficult to understand the voices on the tape clearly.

- It became too long.

QUESTION 3: Use the space below for any other comments which you may have regarding programmed instruction.

- It would have been ideal if each oral response could have been performed individually.

- Its great where appropriate.

- I profited from the lesson and I think it was beneficial.

- I enjoy this type of instruction, but would not like it all the time.

- Would be even better for teachers if were student type statements.

PRACTICE SESSION 2 QUESTIONNAIRE - Objective Section

1. Do you feel this practice session has improved your performance of the skills involved?

*93% Yes
7% No

2. Do you feel that the instructions for the practice session were adequate?

97% Yes
3% No

3. Do you feel that the tape recorder was useful in the practice session?

90% Yes
10% No

4. Do you feel that it was helpful to work with a partner during the practice session?

100% Yes
0 No

* Represents the percentage of 30 subjects checking particular answer.

5. Which term below do you feel best describes the level of this practice session?

0 Too Easy
10% Easy
77% Suitable
13% Difficult
0 Too Difficult

6. How do you like the practice session method of learning?

0 Less than the regular classroom method
10% The same as the regular classroom method
90% More than the regular classroom method

7. The questions on your Question Card were:

0 Too Easy
7% Easy
80% Suitable
13% Difficult
0 Too Difficult

PRACTICE SESSION 2 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about the practice session that you particularly liked?

- Having the opportunity of listening to my answer on the tape recorder to analyze the response was very enlightening. Also, I liked the opportunity of the critique.

- The directions were simple and clear. This is important.

- Working with a partner makes it easier to discuss problems than if one were in a room of people.

- It was good to review with another person this way. I got more out of it.

- It was the replaying of the tapes and from that I could hear my mistakes and also my good points. The instructions were simple and clear.

- The person I worked with was good.

- Brief and to the point.

- I liked the practice in speaking the answers instead of just writing them down.

- Working with a partner and going over the exercises together.

- It allowed for interaction and feedback.

- Having some feedback from partner.

- Working with another person.

- The team idea, use of tape recorder, and critique period.

- Working with a partner and discussing the "critique" of the questions helped a great deal.

- It's very helpful to work with one other person in this way.

- Working with a partner. Going over exercises.

- Chance to discuss general principle. Didn't really understand from just one lesson.

QUESTION 2: Was there anything about the practice session that you particularly disliked?

- The questions were not that clear which made it difficult to pinpoint the exact general principle concepts.

- I need more explanation as to what the general principle was.

- Not enough explanation on the basic principle of the lesson.

- Using the tape recorder tended to hasten me a bit. I felt I went too fast without taking time to think about the question first.

- I don't think the tape recorder playback is that helpful.

- It would be nice to have some way of seeing if our answers were on the right track -- particularly the general principle.

- If there could be a little more help on the principles as it is difficult not to be too specific or too general.

- I am not sure of the general principle and for that reason it was difficult to form our general principle answer.

- I still don't understand about the principle and I keep getting confused.

- The principles are still unclear to a certain extent.

QUESTION 3: Use the space below for any other comments which you may have regarding the practice session.

- The general principle concept should be explained more.

- Even with two of us we are not sure that our general principles are accurate. A general class discussion on this would be helpful.

- Added to the lesson is learning how your own voice sounds on tape. It looks like I can work on mine.

- I don't think the concept of general principle was discussed fully enough.

- This type of exercise is extremely useful because by hearing myself on tape I was able to pick out certain flaws and I am more conscious of them now.

- Realize more the necessity for determining the general principle.

- I find it difficult stating the principle involved.

- Think it is good to have these spaced lessons.

PRACTICE SESSION 3 QUESTIONNAIRE - Objective Section

1. Do you feel this practice session has improved your performance of the skills involved?

*93% Yes
7% No

2. Do you feel that the instructions for the practice session were adequate?

100% Yes
0 No

3. Do you feel that the tape recorder was useful in the practice session?

83% Yes
17% No

4. Do you feel that it was helpful to work with a partner during the practice session?

100% Yes
0 No

*Represents percentage of 30 subjects checking particular answer.

5. Which term below do you feel best describes the level of this practice session?

 0 Too Easy
 3% Easy
83% Suitable
13% Difficult
 0 Too Difficult

6. How do you like the practice session method of learning?

 3% Less than the regular classroom method
 7% The same as the regular classroom method
90% More than the regular classroom method

7. The questions on your question card were:

 0 Too Easy
 3% Easy
77% Suitable
20% Difficult
 0 Too Difficult

PRACTICE SESSION 3 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about the practice session that you particularly liked?

- Easier with practice sessions. It makes us realize we have to think before we begin explanations.

- Its good to be able to discuss your answers to the question asked with someone. This was a good different way of viewing the question.

- I liked the method of working with a partner so there's a good opportunity for the exchange of ideas.

- Working with a partner is really more helpful than in a classroom situation because I think it allows for more open and honest viewpoints.

- My partner was a big help in clarifying answers.

- I'm glad we had a second day of work with the same type of exercise.

- Yes. Reinforced the lesson (#3). I was unsure of the material when working with the manual but I gained some confidence in doing the material orally.

- Feedback from partner.

- Working with a partner.

- Still enjoy idea of partners and tape critique.

- I felt it was a good lesson!

- Use of the recorder.

- I think this has helped as far as organization goes.

- Partners suggestions for more complete answers. Hearing myself.

- The questions were interesting.

- The progression from previous practice sessions.

- The questions seem to be the kind which might be asked in a classroom -- thought questions rather than merely requiring facts.

QUESTION 2: Was there anything about the practice session that you particularly disliked?

- I would like more of an explanation as to what an explanation is.

- Sometimes really difficult to hear tape because of other groups in room.

- The questions are getting more difficult and it seems as if preparation would be necessary for good answers and explanations.

- The questions had too many possibilities for general principles.

- If my partner and I disagree about something we aren't sure how to resolve the problem.

- Not quite sure about the general principle yet, therefore application was made more difficult.

- Applying general principle to an explanation is still not clear. I am afraid I'm practicing it wrong thus I am not getting anywhere.

QUESTION 3: Use the space below for any other comments which you may have regarding the practice session.

- There is an artificiality about answering these questions. In the classroom even spontaneous questions would fall into some context and not be quite so "out of the blue." This gives me a feeling of unreality in doing these exercises.

- An excellent job is done on explaining the directions!
- It seemed to repeat yesterday's lesson but it was still helpful.
- I think it would be interesting to compare the general principles and answers that have been arrived at by the various groups.
- Still unclear as to how the general principle will help me answer the questions, although it may help me to understand the question.
- I feel this is an excellent way to develop skills -- plus you have an individual evaluation by your partner!
- I would like or I should say it would be more helpful to me to work with 2 or 3 other people rather than one.
- Would have liked one more question.
- Further explanation is needed on the general principle and its use.
- I feel mastery of the program is possible by continued practice and I feel more confident after each session.
- Would be more realistic if questioner asked an original question that he was really interested in. Then answer would need to respond to a real curiosity. Detail would be more important.
- The main principle seems to be a difficult concept to grasp and/or enunciate.

PRACTICE SESSION 4 QUESTIONNAIRE - Objective Section

1. Do you feel this practice session has improved your performance of the skills involved?

   *90% Yes
   10% No

2. Do you feel that the instructions for the practice session were adequate?

   97% Yes
   3% No

3. Do you feel that the tape recorder was useful in the practice session?

   83% Yes
   17% No

* Represents percentage of 30 subjects checking particular answer.

4. Do you feel that it was helpful to work with a partner during the practice session?

100% Yes
0 No

5. Which term below do you feel best describes the level of this practice session?

3% Too Easy
0 Easy
80% Suitable
17% Difficult
0 Too Difficult

6. Do you feel that the reteach of the same question was useful to you?

80% Yes
20% No

7. The questions on your Question Card were:

0 Too Easy
7% Easy
90% Suitable
3% Difficult
0 Too Difficult

PRACTICE SESSION 4 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about the practice session that you particularly liked?

- The practice session sure made us think.

- I like the idea of reanswering the question after the critique session.

- The whole practice session was a wholesome, excellent opportunity given us to improve our way and method of explaining to be ready for teaching.

- Having time to respond twice and the critique by other person did help.

- Having a partner to critique my answers.

- I liked having a second opportunity to answer the questions after discussing it with my partner.

- The tape recorder proved more valuable in this lesson.

- Being able to go over our questions thoroughly -- not having so many questions.

- I liked being able to repeat the answer after the critique.

- Reteaching same question after critique very helpful.

- Yes, reteaching of questions!

- The critique session with a partner are most helpful.

- It was helpful to go over the question a second time.

- Oral practice sessions are of more value to me than the written exercises have been.

- There was an explanation of the rule-example-rule process which clarified the problems I felt about it.

- The lesson better defined the rule-example-rule principle.

- Yes, more than any other time came closer to simulating a classroom situation.

- It was easier to formulate a first answer knowing you had a chance to do it over after. I felt more relaxed.

- The critique of each at the four points.

- Working with just one question but repeating it on the tape made me better.

QUESTION 2: Was there anything about the practice session that you particularly disliked?

- We didn't have enough time for each of us to redo our questions.

- We didn't have sufficient time to replay each other's tape during the critique session.

- Too many things required in an answer.

- Second time on the same question, we got hung up on words on the four parts.

- I didn't do my question again because I couldn't find a way to improve it (I'm sure it wasn't adequate enough). My partner wasn't critical enough.

- I saw little value in re-recording the improved explanation.

QUESTION 3: Use the space below for any other comments which you may have regarding the practice session.

- I feel that perhaps in the classroom I might be less inhibited than with the tape recorder. My answers hopefully will be more spontaneous.

- Wish there was time for many, many, more practice sessions with recorder.

- I would like to see each partner record the same question spontaneously. In that way other points and techniques for answering may come out better than in a critique.

PRACTICE SESSION 5 QUESTIONNAIRE - Objective Session

1. Do you feel this practice session has improved your performance in developing complete explanation?

*97% Yes
3% No

2. Do you feel that the instructions for the practice session were adequate?

100% Yes
0 No

3. Do you feel that the tape recorder was useful in the practice session?

70% Yes
30% No

4. Do you feel that it was helpful to work with a partner during the practice session?

100% Yes
0 No

5. Which term below do you feel best describes the level of this practice session?

3% Too Easy
3% Easy
90% Suitable
3% Difficult
0 Too Difficult

*Represents percentage of 30 subjects checking particular answer.

6. Do you feel that the reteach of the same question was useful to you?

73% Yes
27% No

7. The question on your Question Card was:

0 Too Easy
7% Easy
83% Suitable
10% Difficult
0 Too Difficult

PRACTICE SESSION 5 QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about the practice session that you particularly liked?

- Hearing question twice was helpful.
- I think working with a partner was very helpful.
- Questions written for us to answer were quite interesting.
- The practice was necessary -- it would have been nice to have more practice.
- Working with a partner. Being able to repeat answer.
- Felt more secure and relaxed working with tape recorder.
- Oral work better for me than written work.
- Having only one question.
- Found the critique particularly helpful.
- Working with partner. Chance to reteach some questions.
- The questions were good, they left much room for examples.
- Was good for organization.

QUESTION 2: Was there anything about the practice session that you particularly disliked?

- The tape recorder.
- It was difficult to draw on specific facts about a question. In the classroom the question would be at least somewhat related to material being discussed.

QUESTION 3: Use the space below for any other comments which you may have regarding the practice session.

- I think it is good to practice answering questions, however, I feel some of these questions could be used in discussion.

- I still find it difficult to gather all the information necessary to answer the questions in my mind, sort it out, and then answer, clearly and concisely. I am still composing the answer as I go along which results in many pauses.

- It would be good to hear more tapes like on the first day. So we could hear the question and use our "skills" on those varied voices. Then have a partner to discuss with, of course.

- The entire week has been beneficial to me. I thought the manual was written in a very interesting and clear manner. This helped me to understand the main points.

- Would like longer sessions with tape and partner.

- I feel these sessions have given us a better understanding of the techniques of explanation!

- I found the unit helpful and a good review of skills that are necessary in the classroom.

- Perhaps I have a mental block against tape recorders, but I found it very difficult to speak into it.

FINAL QUESTIONNAIRE - Objective Section

In order to get your reaction to the training you have just completed, will you please fill out the following questionnaire. As you are answering the questionnaire, attempt to think of the entire program you have completed, and answer from that frame of reference. There is ample space at the end for any additional comments or reflections you may wish to add.

1. How successful do you think this "How to Explain" program was as a teaching method?

*70% I learned more than I could have from a teacher in the same amount of time.

13% I learned about the same as I could have from a teacher in the same amount of time.

17% I learned less than I could have from a teacher in the same amount of time.

* Represents percentage of 30 subjects checking particular answer.

2. Do you feel that this program would improve the performance of a teacher?

90% Yes
0 No
10% Don't Know

3. How successful do you think semi-programmed instruction is as a teaching method?

67% I learned more about listening than I could have learned from a teacher in the same amount of time.
20% I learned about the same as I would have learned from a teacher in the same amount of time.
13% I learned less about listening than I would have learned from a teacher in the same amount of time.

4. Which term below do you feel best describes the teaching level of this program?

0 Too Easy
17% Easy
80% Suitable
3% Difficult
0 Too Difficult

5. Do you feel that the organization of your spoken statements will be more effective as a result of this program?

80% Yes
7% No
13% Don't Know

6. The manual was:

20% Very Helpful
63% Helpful
13% Somewhat Helpful
3% Not Very Helpful
0 Not Helpful At All

7. In general, the written material in the manual was:

7% Too Easy
13% Easy
80% Suitable
0 Difficult
0 Too Difficult

8. The written exercises in the manual were:

0 Too Easy
13% Easy
80% Suitable
7% Difficult
0 Too Difficult

9. The manual was:

0 Not Clear At All
0 Confusing
27% Somewhat Clear
63% Clear
10% Very Clear

10. In general, I felt the manual was:

0 Very Dull
10% Dull
47% Somewhat Interesting
37% Interesting
9% Very Interesting

11. How do you like the practice session method of learning?

3% Less than the regular classroom method
23% The same as the regular classroom method
23% More than the regular classroom method

12. Which term below do you feel best describes the level of the practice session?

0 Too Easy
10% Easy
87% Suitable
3% Difficult
0 Too Difficult

13. Do you feel this practice session improved your performance of the skills involved?

93% Yes
7% No

14. Do you feel that the tape recorder was useful in the practice session?

87% Yes
13% No

15. Do you feel that the instructions for the practice session were adequate?

100% Yes
0 No

16. Do you feel that it was helpful to work with a partner during the practice sessions?

97% Yes
3% No

17. With regard to the practice sessions, I felt:

0 Very Uncomfortable
23% Uncomfortable
7% Indifferent
60% Comfortable
10% Very Comfortable

18. The practice sessions were:

27% Very Useful
63% Useful
7% Somewhat Useful
3% Not Very Useful
0 Not Useful At All

19. The questions on your Question Card were:

0 Too Easy
3% Easy
87% Suitable
10% Difficult
0 Too Difficult

20. The training period was:

0 Much Too Short
17% Somewhat Too Short
53% Just Right
20% Somewhat Too Long
10% Much Too Long

21. The rating that best describes this activity is:

17% Excellent
73% Good
37% Average
7% Below Average
0 Very Poor

22. Regarding this activity as a whole, how interested were you in it? It was:

3% Very Dull
0 Dull
37% Somewhat Interesting
43% Quite Interesting
17% Very Interesting

FINAL QUESTIONNAIRE - Subjective Section

QUESTION 1: Was there anything about the practice session that you particularly liked?

- I enjoyed working with a partner, because it was informal and I was able to relax.

- I just enjoyed the pace that was set in terms of sorting out "things" etc. in a sentence and then progressing from there.

- During the practice session, my partner and I had the opportunity to replay each other's explanations on tape and afterwards, made comments on each other's method of explaining which paved the way for the exchange of ideas and thus, gave each other the motivation to do better in the next practice sessions.

- I enjoyed working with a partner. She was honest and therefore helpful in her critiques. I appreciated the help she gave me.

- Well organized, well planned.

- I found the practice with a tape recorder very useful.

- Working with a partner and the use of a tape recorder.

- A very well-organized course which can continue to help the teacher as she works with her classes. The manual can be referred to to refresh the teacher's memory of the form of good answers.

- Having someone to talk about the information with. Being able to practice the concepts we just studied.

- I really liked working with a partner and being able to have a critique session after each question. This, I feel, helped me to identify my mistakes.

- Focusing and "homing" in on a true classroom problem. Tape recorder practice sessions with partner. Step-by-step levels to develop skill, but at each step utilizing previous lessons.

- Working with a partner and going over your answers and discussing them.

- I liked working with a partner. It was helpful to discuss the exercises and how answers could be improved.

- I felt the sessions were well organized and gave us a good opportunity for practicing what we learned.

- Verbal practice was good.

- Working with partner. Having specific guidelines to follow.

- I liked working with a partner. Using the critique and the gradual development in the method.

- Tape playback was helpful.

- Feedback from partner. Chance to answer spontaneously, think, then answer again.

- Liked having the chance to speak and hear my spoken statement.

- I liked the opportunity to be able to criticize my work and to be criticized immediately after giving an explanation.

- The critiques given by each member were useful.

QUESTION 2: Was there anything about the practice session that you particularly disliked?

- I disliked the tape recorder.

- I did not always feel qualified to answer the questions.

- Not enough instruction to show how to improve while we were practicing.

- I don't feel the tape recorder was all that helpful. If the answers had been long and involved, then it would have been necessary to play back. However, in our practice sessions it was not difficult to remembers what the other person had said.

- I would have liked to have been able to practice with more than one person.

- Too long.

- Disliked the written section but can see the necessity of beginning with this.

- Some of the questions were too difficult, tape recorder was inhibiting but at the same time useful.

- The audience the speaker spoke to was another teacher and not a student. This has an effect on the kind of explanation given.

QUESTION 3: Use the space below for any other comments which you may have regarding the practice session.

- Practice sessions enabled me to acquire better skills in explaining through logically developed lessons provided by the manual.

- This was a useful endeavor because, although I felt I intuitively understood how to answer questions, it made me more aware of the process.

- I would like to compare our answers with others either at the end of one session or the beginning of the next.

- I don't feel that I improved that much through no one's fault but my own. I tend to freeze in front of a tape recorder. I believe, however, that I did learn a great deal from the course. I know how to organize an explanation and I feel that I could do it with greater ease in a natural classroom situation.

- Felt quite uncomfortable at the beginning of sessions but quite comfortable by final session.

- I felt that I would like to have longer oral practice sessions with tape recorder and partner.

- I feel it served its purpose greatly and helped in the organization of ones thoughts.

- In general, I think the practice sessions were helpful. The manual made me aware of the importance of listening, organizing thoughts, and explaining things in a clear and concise way.

- I would shorten the written portion of the exercises in the manual.

- Would have preferred shorter sessions with more opportunities to listen to how others answered the questions.

- I think I could have done much better and have been much more relaxed by taping this either in front of children or alone in a room. Then replaying and criticizing in other's presence would be helpful. Comparing my answers with theirs also brings forth new approaches.

- I think time could be cut down with more emphasis placed on speaking and less on writing. Would be helpful if a classroom situation could be simulated where questions could be seen in context of methods of answering, like thinking back for discussion and summing up discussion, could be experimented.

- I think general principle could have been explained a little more. I found it a little difficult and thus my applications were not as good as they could have been.

- Why not expand the current program to include a section on explaining through re-questioning?