

ABSTRACT

THE EFFECTS OF COMMUNICATION STYLE AND LEVEL OF STUDENT DOGMATISM UPON THE ACADEMIC ACHIEVEMENT AND INTERPERSONAL RELATIONSHIP OBJECTIVES OF EFFECTIVE TUTORING

By

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This research was conducted to study the effects of communication style and level of student dogmatism in regard to synthesis learning achieved during an initial tutorial session and in regard to the task and interpersonal attraction objectives of a continuing tutorial relationship.

The measurement of synthesis learning consisted of the subjects' total scores earned after playing a word formation game which required novel solutions to be created by abstracting and integrating specific operations from six concepts. A split-half reliability coefficient of .81 was found by the Spearman-Brown prophecy formula for the subjects' points earned during the different phases of the game.

Two dimensions of a student's preference to maintain a continuing tutorial relationship were measured in this study: task attraction

and interpersonal attraction. The task attraction dimension concerned the student's perception of the tutor's success in generating interest and enthusiasm in the content material. The interpersonal attraction component included personal attraction, coordination of effort, and satisfaction with tutorial outcomes. The reliability and content validity of the sixteen questionnaire items measuring task and interpersonal attraction were determined by factor analysis.

Since it was not possible to secure subjects who were receiving tutorial assistance during the ten-week summer session, the subjects were drawn from an introductory freshman course. The seventy-one subjects received ten-minute tutorial sessions in which the experimental tutor performed either the one-way or the two-way communication style. In the one-way communication style, $62\% \pm 10\%$ of the tutor's total verbal communication consisted of information and direction giving behavior while $31\% \pm 10\%$ consisted of questioning and clarifying statements. In the two-way communication style these percentages were reversed. Also, in both the one- and two-way styles praise or encouragement and corrective feedback constituted $5\% \pm 4\%$ and $2\% \pm 2\%$, respectively, of the tutor's total verbal communication behavior. Two independent coders found the performance of the behaviors within the error margins and the inter-coder product-moment reliability coefficient was .91.

For the low dogmatic subjects it was hypothesized that the two-way communication style would significantly increase task and interpersonal attraction and synthesis learning. However, for the high

dogmatics it was predicted that the one-way style would significantly increase task and interpersonal attraction, but only slightly improve synthesis learning.

The data were not significant for any of the hypotheses tested by the treatments-by-levels analysis of variance design. The communication style and dogmatism main effects were also non-significant, although for synthesis learning the communication style effect approached significance (.06). Though not reaching statistical significance the findings favored the two-way communication style rather than the one-way style for synthesis learning and interpersonal attraction for both the high and the low dogmatic students.

In future research it was felt that the amount of information and direction giving in the two-way style should be reduced. It was also felt that the effects of the tutor's nonverbal communication behavior should be studied with both communication styles. In addition, it was recommended that a treatments-by-subjects design be used to reduce the random variability of subjects' responses and that the content material selected for the two tasks be derived from courses in which the subjects were enrolled. This latter recommendation recognized the difficulties of developing two equivalent learning tasks and of measuring entry knowledge.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Communication

1971

ACKNOWLEDGEMENTS

To Professor Lawrence Sarbaugh, my Chairman and Thesis Adviser, I wish to express my deep gratitude for the counseling and supervision he willingly gave throughout this research. Great appreciation is also extended to him and to Professors Mason Miller, David Ralph and Everett M. Rogers for the confidence they have shown in me.

I also wish to thank Mr. Lonnie Hopson who served as the experimental tutor in this study. His interest, cooperation and dedication as an assistant in this research were vital to its completion. Indebtedness is also due research assistants Barbara Walker and Cheryl Shurch.

To my wife Gayl, it is impossible to express the full extent of my deepest appreciation and gratitude. Her efforts as my chief research assistant during the experiment were magnificent and her encouragement and support throughout these years of graduate study have been invaluable.

And finally, thanks are extended to my son Will for delaying his arrival in the world for two weeks so that this research might be completed.

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CHAPTER I

INTRODUCTION

The processing of information in dyadic interpersonal communication systems may be appropriately studied in marriage, friendship, business, education and the helping professions. Differences are often found in the functions served by such systems and in the role relationships and homophily of the system components. Superordinate-subordinate role relationships such as manager and worker, tutor and student, and physician and patient emphasize the performance of such task functions as supervision, instruction and/or amelioration for participants who are often heterophilous or unlike each other in regard to age, education, social status, values, beliefs, etc. (Rogers, in press). Dyadic peer relationships, on the other hand, like husband and wife, adult and adult, child and child tend to place greater emphasis upon maintenance functions involving the disclosure of internal feeling states among members who are generally homophilous or similar to one another in regard to age, education, etc. In addition, it is generally recognized that task and maintenance functions are interdependent so that the achievement of either one often requires the accomplishment of the other as well.

In superior-subordinate and peer role relationships the cycle of messages between the interdependent interactants are designed to produce the information needed to reduce the level of uncertainty within the communication system concerning task and maintenance functions (Cherry, 1961). The physician and tutor transfer messages to identify and resolve the medical or academic problem of the patient or student, and the patient and student seek to determine the cause and remedy for their difficulties. The manager transmits messages to insure that certain employment performance standards are met; and the worker, in turn, wishes to determine the range of his rights and obligations as a member of the system. Similarly, in relationships such as husband and wife the partners encode messages to ascertain and/or confirm their mutual responsibilities and feelings of affection for one another. Thus each of the interactants in these dyads is dependent upon the other for messages which will reduce the level of uncertainty within the communication system.

Rationale

This research sought to study the messages which effectively reduce the level of uncertainty concerning the task and maintenance functions of the tutor-student dyad communication system. The tutor-student dyad has become a particularly relevant communication system in recent years because of changes that have occurred in the admissions policies of many American colleges and universities. In the past five years more than five hundred colleges and universities have developed programs to attract minority students (Walker, 1968).

In response to this situation a number of tutorial programs were organized for minority students at Michigan State University.¹ The goal of these tutorial programs has been to provide effective tutoring for students. Effective tutoring consists of the performance of communication behaviors by a tutor which enables a continuing relationship with a student to be established and helps the student to master the educational skills that are necessary for him to succeed academically. Thus the maintenance function of effective tutoring concerns the tutor and student's continuing interpersonal relationship while the task function relates to the student's improved academic performance.

The accomplishment of the task function often requires that the tutor supervise the student's day-to-day and week-to-week study habits. To enable a student to succeed academically a tutor must help a student learn specific knowledge and/or skills and to transfer or apply those skills in new problem solving situations. In addition, a tutor should frequently review with the student the newly acquired knowledge and/or skills to insure that they will be retained by the student. This supervision is necessary for the tutor to adequately determine that the student's academic progress is satisfactory and that the goal of academic success will be achieved.

¹During the 1968-69 academic year, a group of graduate students organized one tutoring program known as Stride; a husband-wife team who are University faculty members administered a second program. During the summer of 1969 the Center for Urban Affairs at Michigan State University assumed the responsibility of organizing and administering a single tutorial program for all students studying at the University. This program is designed primarily, but not exclusively, to serve the needs of minority students. It is possible for any student needing academic assistance to secure a tutor through the Center.

It is unlikely that a tutor will be able to help a student to resolve his academic difficulties in a single meeting. Thus it is essential for a student to wish to continue to meet with the tutor in future tutorial sessions. The duration of a continuing relationship would depend upon the student's own or the student and tutor's joint decision concerning the number of weeks or months for which tutorial assistance might be necessary and/or beneficial for the student. Thus a continuing tutorial relationship may be defined as a relationship which is founded upon the preference of the student to meet again with the tutor after the initial session and as one that varies in its duration according to the perceived need of the student.

It has been felt that tutors have often lacked the experience and knowledge to perform the communication behaviors that would both enable a continuing relationship with a student to be established and help a student to master the necessary skills to achieve academic success. Thus there is a need for communication research to focus on tutor communication behavior leading to more effective tutoring.

Purpose of the Study

The purpose of this research was to identify the communication behaviors which will enable tutors to be more effective in achieving task and maintenance objectives. The study was designed to integrate and extend previous research dealing with teacher communication behavior and student learning and satisfaction.

Focus of the Study

One area of research into student learning and satisfaction by the communication style researchers has studied teachers' performance of different classroom behaviors while largely ignoring student personality variables. A second concentration of research has examined student personality variables such as anxiety, need for independence, dogmatism, etc., while failing to precisely measure or control for the communication styles used by classroom teachers. In addition, both the communication style and the personality researchers have treated academic learning as a unitary dimension and have not differentiated educational objectives according to specific levels within the cognitive domain. Therefore, this research sought to integrate and extend previous research by focusing upon both communication style and personality factors which are directly pertinent to student satisfaction and achievement at the synthesis level of the cognitive domain.

Communication Style Research

The communication style researchers created several constructs to dichotomize the behavior of teachers in classroom settings: "integrative and dominative" (Anderson, 1937), "learner-centered and teacher-centered" (Withall, 1949), and "indirect and direct" (Flanders, 1960). Integrative, learner-centered and indirect communication styles emphasized question asking, praise or encouragement, and the acceptance and clarification of the students' feelings and ideas, while dominative, teacher-centered and direct styles stressed criticism and information and direction giving.

The strength of the communication style research is found in the precise measurement of the proportions of teachers' total classroom communication allocated to the performance of each of the different behaviors. The research findings have shown that teacher communication styles which emphasized praise, question asking, and the clarification of students' feelings and ideas produced significantly greater learning of academic material and significantly more favorable attitudes toward teachers (Anderson, et al., 1946), (Withall, 1949), (Perkins, 1951), (Cogan, 1958), (Flanders, 1959, 1965, 1968), (Soar, 1965), (Amidon and Giammatteo, 1967), (Amidon and Hough, 1967), (Pankratz, 1967), and (Robbins, 1967).

The weakness of this work lies in the failure of these researchers to clearly differentiate the effects of positive and negative reinforcement from the effects of questioning and clarifying statements and from information and direction giving behavior. Thus it is not possible to determine whether the findings of the communication style research resulted from the administration of questions and clarification statements, information and direction giving, or whether the findings were an artifact of the relative amounts of praise and criticism performed by classroom teachers.

Individual Differences Research

When the individual differences among students have been controlled for in terms of such personality variables as intra- and extra-punitiveness, anxiety, dependency, compulsivity, and dogmatism, a broader picture of the effectiveness of different teacher communication

behaviors has emerged. Low anxious, low compulsive, independent and extra-punitive students were found to prefer and learn more under instructor communication styles which stressed the asking of questions and the clarification of student ideas, while the achievement and satisfaction of highly anxious, highly compulsive, dependent, and/or intra-punitive learners were facilitated by communication styles stressing lecturing and the giving of directions (Wispe, 1951), (Smith, 1954), (Patton, 1955), (Smith et al., 1956), (Grimes and Allinsmith, 1961). In research with the dogmatism construct, studies by Zagona and Zurcher (1964) and by Byrnes (1968) indicated that high dogmatic students may prefer a communication style which emphasizes lecturing and direction giving while low dogmatic students may prefer a style which stresses questioning and clarifying statements. However, previous research was not conducted to determine whether high and low dogmatic students might also learn more under encoding styles which emphasize the performance of these different behaviors.

The strength of the personality variable research lies in the fact that it has demonstrated the relevance of individual differences to an understanding of how teacher communication behaviors affect student learning and satisfaction. One of the weaknesses of the personality focus concerns the fact that like the communication style researchers these researchers also failed to differentiate between the effects produced by praise and criticism and the effects produced by questions and clarification statements, and by lecturing and direction giving behavior. In addition, the personality researchers did not

employ reliability procedures to measure or control for the proportionate performance of these different behaviors in communication styles described as "directive--non-directive," "structured--unstructured," and "subject-matter-centered--student-centered." Thus it is not possible to determine how much of the teachers' total classroom communication was allocated to the performance of these different behaviors.

Measurement of Learning

Academic achievement has been measured by the communication style and personality researchers through the use of tests which determined the students' knowledge of course content materials at the junior and senior high school and college levels. However, these tests were not constructed to measure student learning at different levels of the cognitive domain: rote learning, comprehension, application, analysis, and synthesis (Bloom, 1956). Thus it is not possible to determine from the findings of these research foci whether specific teacher communication behaviors and/or student personality characteristics affect student learning at one or more of these levels of the cognitive domain. Also when instruction is directed to a specific level it is not possible to determine whether student attitudes toward a teacher are affected by teacher communication behaviors and/or student personality characteristics.

Summary

This study sought to integrate and extend previous research by focusing upon the effects of both tutor communication style and student dogmatism in regard to learner satisfaction and achievement at the synthesis level of the cognitive domain. This level was selected because academic success in college necessitates that students accomplish educational objectives requiring the selective delineation and integration of course content materials. The dogmatism construct was selected as the control variable because it was the only personality variable which previous work had shown to be related in a conceptually meaningful manner to student preference and achievement at the synthesis level.

This experimental study sought to overcome the weaknesses of the previous research by the communication style and personality variable researchers. A reliability procedure was utilized to control for the administration of positive and negative reinforcement. In addition, the performance of other communication behaviors relevant to student achievement and preference at the synthesis level were experimentally manipulated as proportions of the tutor's total communication behavior. This was achieved by the researcher's development of a one-way tutor communication style emphasizing information and direction-giving behavior and a two-way communication style stressing questioning and clarifying statements. Also a synthesis learning task was devised in order to measure student achievement.

Review of the Literature

This section will present a review of prior research dealing with the effects of student dogmatism level and teacher communication style upon the academic achievement in and the preference of students for different learning situations. This review will be divided into two subsections, the first of which will cite findings from research upon student dogmatism level and academic achievement. The second subsection will examine studies pertaining to the achievement and satisfaction of students of different dogmatism levels with varying teacher communication styles.

Dogmatism and Learning

The dogmatism construct refers to the acquisition of and/or the resistance to change of systems of knowledge or belief. A central proposition of Rokeach's (1960) theory of belief-disbelief systems is that the cognitive systems of closed-minded (high dogmatic) persons are more resistant to change than the cognitive systems of open-minded (low dogmatic) persons. The closed-minded person tends to view information from a narrow time perspective and to compartmentalize the various beliefs that he holds. However, the open-minded person tends to evaluate knowledge along a broad time dimension and to integrate these various knowledge or belief structures together. Thus the dogmatism construct enables predictions to be made about the probable acquisition of new systems of knowledge by evaluating the relative abilities of persons to bring together the various parts of their belief systems when assessing new information.

The cognitive task of bringing together the various parts of knowledge or belief systems requires the individual to perform the mental processes of analysis and synthesis. Analysis involves the breakdown of knowledge or belief systems into their constituent elements or parts and the detection of the organization and relationships among the parts (Bloom, 1956). Synthesis is a process of working with the elements or parts of knowledge or belief systems and of selectively combining these elements or parts to form a pattern, whole, or structure not clearly formulated before (see pages 50-52).

The literature contains both experimental and non-experimental studies which have attempted to show how the analysis and synthesis skills of low and high dogmatic subjects affect learning. Experimental studies by Rokeach, McGovney and Denny (1955) and by Rokeach and Vidulich (1960) which utilized the Denny Doodlebug problem showed that low dogmatic subjects significantly outperformed high dogmatic subjects in synthesis skill. However, no significant differences were found for analysis. Thus these researchers found no significant differences between high and low dogmatic subjects in their ability to analyze or break down each of the concepts involved in the Denny Doodlebug problem into their constituent operations, elements, or parts so that these operations, elements, etc. might be identified and discriminated (distinguishing "positive" and "negative" instances) (Berlyne, 1965). However, these researchers did find significant differences in the abilities of these subjects to synthesize or selectively delineate and integrate specific operations from the concepts to form a solution to the problem.

When the relationship between dogmatism and learning has been studied in classroom situations, however, the results have been contradictory. Studies by Ehrlich (1961), Frumkin (1961), Zagona and Zurcher (1965), and Byrnes (1968) have found an inverse relationship between dogmatism and academic achievement in introductory college courses. However, other researchers have found no significant differences (Christensen, 1963), (Costin, 1965, 1968) between dogmatism and learning. In addition, two studies have produced inconclusive results. Rokeach and Norrell (1966) examined this relationship in thirty-three college courses and found that seventeen of the courses provided significant negative correlations between dogmatism and final course grades. White and Alter (1967) found an inverse relationship between dogmatism and final examination grades in six out of fourteen sections of an introductory college course.

These inconclusive results concerning the relationship between dogmatism and classroom learning present a problem of interpretation. It is difficult to interpret the on-again--off-again character of these findings because of the composition of the test items used to measure the relationship between dogmatism and classroom learning. In their multiple choice and true-false examinations, Ehrlich (1961), Frumkin (1961), Costin (1965 and 1968), Zagona and Zurcher (1965), and White and Alter (1967) treated analysis and synthesis as a unitary dimension of learning. They did not treat learning objectives as a hierarchical cognitive domain where synthesis would represent a higher order of cognitive process than analysis in that synthesis presupposes analysis while the latter does not presuppose the former. Thus these

researchers have not formulated criteria by which to judge whether their examination test items measured high and low dogmatic students' abilities to perform synthesis or merely analysis skill. Therefore, it appears that these classroom studies have failed to either confirm or disconfirm the findings of research conducted by Rokeach, McGovney and Denny (1955) and Rokeach and Vidulich (1960) that low dogmatics only significantly outperform high dogmatics in synthesis learning.

There have been two studies, however, which have measured the relationship between dogmatism and learning by restricting the examination content to items requiring the performance of synthesis ability. In an early study Christensen (1963) measured this relationship with an essay examination. Christensen found no significant differences in learning between the high and low dogmatic students in an introductory psychology course on the essay test. In a later study, however, Byrnes (1968) did obtain significant results. Byrnes measured classroom learning by content analyzing solutions to a communication consultant problem proposed by subjects who were drawn from an introductory communication course. The students whose proposed solution emphasized the setting up of a committee were classified as evidencing an inability to apply the subject matter of the course in solving the communication consultant problem while students who suggested several communication variables in addition to the setting up of a committee were classified as having such an ability.

Byrnes found that the low dogmatic subjects demonstrated significantly greater ability than the high dogmatic subjects in performing the synthesis skill required to solve the communication consultant

problem. In addition when the results of the Byrnes study were examined in the light of findings from an earlier laboratory study by Rokeach, Oram, Laffey and Denny (1960), the two studies together provided a possible explanation as to why the essay test in the Christensen study might have failed to yield the expected inverse relationship between dogmatism and learning. The studies by Byrnes and Rokeach et al. suggested that the encoding style of a teacher might function as an intervening variable which affects the relationship between dogmatism and synthesis learning. In the following section a rationale is developed for the probable effects of different teacher communication styles upon students of high and low dogmatism.

Dogmatism and Communication Style

Several research studies indicated that the academic achievement of students of varying levels of dogmatism might be influenced by the manner in which information is presented in the classroom. In a study by Rokeach, Oram, Laffey and Denny (1960) the high and low dogmatism subjects solved the Denny Doodlebug problem in two experimental conditions--the "working through" and the "silver platter" conditions. In the silver platter condition the three clues necessary to achieve the correct solution were provided at the beginning of the problem. However, in the working through condition the three information clues were only provided at five minute intervals if the subjects had not already figured out these clues for themselves. In addition, the subjects in both conditions were allowed to ask questions to which the research assistants provided either yes or no answers.

The results showed that in the analysis phase of the study the high and low dogmatics did not differ significantly in their problem solving ability. Analysis skill was measured by comparing the time required by the high and low dogmatism subjects in the working through condition to discover each of the three clues. The authors reasoned that there was no analysis phase in the silver platter condition since the three clues necessary to achieve problem resolution were initially given to the subjects.

Synthesis skill was measured in both experimental conditions as the time required to integrate the three clues and achieve a solution to the problem under study. Thus in the working through condition the synthesis phase of the experiment consisted of the time required for problem resolution after the three 5-minute clue analysis periods had been concluded. In the silver platter condition the synthesis phase consisted of the problem solving time required after the initial presentation of the three clues.

The authors found that for the synthesis phase of problem resolution, the time taken by the low dogmatic subjects in the working through--but not the silver platter--condition was significantly less than that taken by the high dogmatic subjects in both experimental conditions. In addition, the authors found that for the low dogmatics the time required for problem resolution was significantly less in the working through condition than in the silver platter condition.

For the high dogmatic subjects the working through condition did not have a positive effect upon learning. The time taken by the high dogmatic subjects in the working through condition was the same as that taken by the low dogmatic subjects in the silver platter condition.

In addition, the high dogmatics required a longer period of time to achieve problem resolution in the working through condition than they did in the silver platter condition. Furthermore, the high dogmatics in the silver platter condition also took less time to solve the problem than the low dogmatics did in the silver platter condition. These latter two findings did not, however, reach the .05 significance level.

The results of this study indicated that for the synthesis phase of the problem solving, the working through condition greatly facilitated the learning of the low dogmatic subjects and slightly inhibited the learning achieved by the high dogmatics. The silver platter condition, on the other hand, only slightly improved the performance of the high dogmatics and significantly hindered the performance of the low dogmatics.

If it may be assumed that the silver platter condition is analogous to a college classroom situation where information is given by lectures to students while the working through condition is analogous to a classroom environment where the students reason out the information themselves in a more or less Socratic relationship with the teacher, the results of this study also offer a possible explanation for the finding of the Christensen study. Christensen (1963) failed to find a significant difference between the high and low dogmatics' performance on an essay examination. The students in the Christensen study were taught by the lecture method which it is assumed is analogous to the silver platter condition in the study described above. Since Rokeach et al. found no significant differences in the synthesis learning of the high and low dogmatics in the silver platter condition,

one would not have expected Christensen to have found any significant differences either. One would have only expected Christensen to have found a significant difference between the high and low dogmatic subjects on the synthesis demands of an essay test if the students had been taught in classroom discussion sections in which a Socratic discussion method was utilized.

Tentative support for this possible explanation is provided by the Byrnes study in which the low dogmatics significantly outperformed the high dogmatics in applying course concepts to a communication consultant problem which required the demonstration of synthesis cognitive skill. In addition, he also found that the classroom discussion sections slightly inhibited the synthesis learning of the high dogmatic students and greatly facilitated the synthesis learning achieved by the low dogmatic students. However, due to small cell sizes, Byrnes was not able to run a statistical test to determine whether the observed interaction was significant.

These three studies taken together offered implications for effective tutor communication behavior when dealing with high and low dogmatic students. The high dogmatic student might benefit slightly from tutor lecturing or information giving behavior which provides the solution for problems necessitating synthesis skill. However, the low dogmatic student might demonstrate greater academic achievement upon learning tasks requiring this cognitive skill when the tutor utilizes a Socratic, questioning and clarifying communication style.

The Byrnes study and a study by Zagana and Zurcher (1964) also offered implications about the probable effects that tutor

communication style might have upon the preference of high and low dogmatic students to maintain a continuing tutorial relationship. Byrnes found that the high dogmatic students significantly preferred the televised sections of a course taught by the lecture method and that the low dogmatic students significantly preferred the class discussion sections taught by the Socratic method. Zagona and Zurcher found the same results for a sample of high and low dogmatic subjects who had been drawn from an introductory psychology course in which the students attended two lectures and one discussion class per week.

In the latter study, the authors observed for four months the discussion class communication behavior of the thirty highest and lowest scorers on the Dogmatism scale (Rokeach, 1960). These students had been assigned to separate discussion classes composed of homogeneously high or low dogmatic subjects. The authors observed that the high dogmatic subjects were unsponaneous and unresponsive to the section instructor's questioning and clarifying communication behavior. In addition, the authors noted that the high dogmatics preferred to have the section instructor provide them with explicit directions rather than leave decisions about discussion group activities to the class members themselves. The low dogmatic subjects, on the other hand, seemed very responsive to the questioning and clarifying Socratic teaching method of the discussion class instructor and were also eager to volunteer suggestions about the topics they wished to cover during the discussion group classes. Thus the results of the Zagona and Zurcher study indicated that the low dogmatic student may prefer a tutor communication style which emphasizes a two-way flow of

communication between the tutor and student. However, high dogmatics may prefer a communication style which emphasizes the one-way flow of information and direction giving from the tutor to the student.

Although classroom interaction was not specifically studied in the Byrnes study, his findings appeared to confirm this inference about the probable preference of low and high dogmatic students for two- and one-way tutor communication styles. It seems reasonable to assume that in a televised lecture a professor would perform information giving and direction giving behavior far more frequently than in a class discussion where the Socratic method was used. In a televised lecture which has been previously filmed on video tape, as were the lectures in this course, a professor has no verbal or visual means during the lecture itself by which to determine whether the students have grasped the relevance of his comments to the course content. Therefore, it might be assumed that a professor would intersperse his information giving with frequent direction giving (i.e., "Now I would like for you to turn your attention to this point...") to insure that the students are continually aware of the precise content materials being covered. However, in a class discussion taught by the Socratic method one might assume that a professor would perform far more questioning and clarifying behavior than he would during a televised lecture. It appears axiomatic that a professor using the Socratic method would both frequently ask questions to stimulate discussion and make statements that clarify, develop or paraphrase in order to maintain or continue the interaction.

Summary

In studies by Rokeach, McGovney and Denny (1955) and Rokeach and Vidulich (1960) it was shown that the analysis abilities of high and low dogmatics did not differ significantly, but that low dogmatics significantly outperformed the high dogmatics in synthesis skill. In addition, four other studies were reviewed (Rokeach, Oram, Laffey and Denny, 1960; Christensen, 1963; Zagana and Zurcher, 1964, 1965; Byrnes, 1968) which indicated that particular tutor communication behaviors might affect the preference for and achievement within a synthesis learning situation of high and low dogmatic students. The studies by Rokeach et al. and by Byrnes showed that high dogmatic subjects solved synthesis problems slightly more efficiently when information was given to them than they did when they had to reason it out for themselves. This finding was not surprising since high dogmatic subjects would be expected to have greater difficulty with a learning task requiring synthesis cognitive skill. However, these studies showed that low dogmatics solved synthesis problems more efficiently when they could work through or reason out information for themselves. In addition, it was suggested that the failure of the low dogmatics to demonstrate superior synthesis skill in the Christensen study might have resulted because this introductory course was taught by the lecture method. Thus these three studies suggested that the synthesis achievement of high dogmatic students might be slightly improved by a one-way communication style which emphasizes the flow of information and direction giving from the tutor to the student. However, the synthesis performance of low dogmatic students might be significantly

facilitated by a two-way communication style which emphasizes the tutor's frequent use of questioning and clarifying behaviors to assist students to reason out information themselves.

In regard to a student's preference to receive continuing academic assistance from a tutor, the findings of the Byrnes and Zagana and Zurcher studies suggested that high dogmatic students might significantly prefer a one-way communication style where the flow of information and direction giving minimized the extent to which the student had to verbally interact with the tutor. In addition, these two studies also indicated that low dogmatics might significantly prefer a two-way communication style which increased the total amount of student talk and tutor-student verbal interaction during a tutorial session.

Development of One-Way and Two-Way Communication Styles

One-way and two-way tutor communication styles were developed by the researcher to determine whether the satisfaction and achievement of high dogmatic students were enhanced by information and direction giving and whether these objectives were facilitated for low dogmatics by questioning and clarifying behaviors. In the one-way communication style 62% of the tutor's total communication behavior consisted of information and direction giving while only 31%, or half as much,

consisted of questions and clarifying statements.² The two-way communication style was characterized by the opposite proportions of these four behaviors. Sixty-two percent of the tutor's verbal behavior consisted of questions and clarifying statements while information and direction giving comprised only 31% of the total.

There were of course other communication behaviors that a tutor might perform during a tutorial session that might also affect the preference for and achievement within a synthesis learning situation of high and low dogmatic students. These behaviors were affective clarification and acceptance, praise or encouragement, corrective

²Information giving: This behavior included all tutor statements about content or procedure that gave fact, data, and/or opinion; it also included the use of rhetorical questions.

Direction giving: This behavior included the requests, orders or commands of the tutor with which the compliance of the student was expected.

Question asking: This behavior pertained to all tutor interrogatory statements for which student answers were expected.

Cognitive and skill clarification and acceptance: This behavior included the statements of the tutor which developed or built upon the ideas or suggestions of the student. Statements that repeated or paraphrased what a student had said or that were designed to help a student think through what he had said or done were included in this category.

feedback, and criticism and rejection.³ A pilot study conducted by the researcher, however, indicated that tutors did not make statements of criticism and rejection to the students in the tutorial sessions.

There was reason to believe that low dogmatics might be more receptive than high dogmatics to a tutor's performance of affective clarification and acceptance behavior. Research studies conducted by Ehrlich and Bauer (1966) and by Hallenbeck and Lundstedt (1966) showed that high dogmatics tend to repress feelings of fear, anxiety, frustration, etc., more than low dogmatics. Thus the performance of affective clarification and acceptance behavior might interfere with the measurement of the effects of the tutor's relative administration of information and direction giving and questioning and clarifying

³Affective clarification and acceptance: This behavior included the recognition, understanding, and approval of a student's internal state. Statements which dealt with student emotions and feelings (i.e., fear, anger, anxiety, frustration, happiness, pleasure, etc.) were included in this category. These statements might recall or predict a student's feelings or might be a reaction to the current internal state of the student.

Praise or encouragement: This behavior included statements of approval or support directed at student behavior. Tutor statements for current behavior as well as for past or predicted future behavior were included in this category. Tutor statements which indicated agreement with student ideas were also included in this category.

Corrective feedback: This behavior consisted of phrases such as "No," "That's incorrect," etc., when such phrases were followed by tutor information and direction giving behavior which informed a student of the incorrectness or inappropriateness of the latter's behavior by making reference to clearly identifiable authority (i.e., definition, common convention or empirically validatable fact).

Criticism and rejection: This behavior consisted of phrases such as "No," "You're wrong," etc., when such phrases were not followed by tutor information and direction giving behavior which gave reference to clearly identifiable authority.

statements upon the student's preference to maintain a continuing tutorial relationship. Therefore, in this experimental study it was necessary to eliminate the acceptance and clarification of students' feelings from the tutor's repertoire of communication behaviors.

It seemed reasonable to assume that both high and low dogmatic students would regard corrective feedback as being negatively reinforcing. In addition, it was assumed that this behavior would be performed more frequently during a discussion class than during a lecture. The data from the studies by Zagana and Zurcher and Byrnes which showed that high dogmatic students preferred lectures to class discussions might have indicated that high dogmatics have a lower tolerance for corrective feedback than low dogmatics. Thus to determine the high dogmatic students' preference and achievement within these two tutor communication styles it was necessary to control and minimize the tutor's performance of corrective feedback. In both the one-way and the two-way communication styles two percent of the tutor's total communication behavior was allotted for corrective feedback.

It was also assumed that both the high and low dogmatic students would perceive praise and encouragement as positively reinforcing. However, since the high dogmatic student might have greater difficulty and experience more frustration in the process of learning a new system of knowledge requiring synthesis cognitive ability, it was assumed that the high dogmatic might be more adversely affected than the low dogmatic by a tutor's infrequent performance of praise or encouragement. Therefore, in controlling for this behavior in both styles, a sizeable proportion of the tutor's total communication behavior was

allocated to the performance of praise or encouragement. It was specified that in both the one-way and the two-way communication styles five percent of the tutor's total communication behavior would consist of praise or encouragement.

The one-way and the two-way communication styles have now been described. It was felt that these two communication styles might affect the preference for and achievement within a synthesis learning situation of low and high dogmatic students. The different proportions and error margins of the performance of the six communication behaviors in the two styles are summarized below. The error margins given recognized that it was virtually impossible for a tutor to allocate an exact percentage of his total verbal communication to the performance of six behaviors.

	<u>One-Way</u>	<u>Two-Way</u>
1. Information giving)		
)	62% ± 10%	31% ± 10%
2. Direction giving)		
3. Corrective feedback	2% ± 2%	2% ± 2%
4. Praise or encouragement	5% ± 4%	5% ± 4%
5. Question asking)		
)	31% ± 10%	62% ± 10%
6. Cognitive and skill clarification)		
and acceptance)		

Two primary sources were utilized in making the decisions as to what proportions of the tutor's total communication behavior should be

allocated to each category in the one-way and two-way communication styles. Reference was made to an article by Amidon and Flanders (Amidon-Hough, 1967) in which the authors present summary data for the performance of these behaviors by direct and indirect classroom teachers. Their conclusions represent a compilation of the data collected from numerous studies conducted at the elementary, junior high and senior high school levels. Reference was also made to an experimental study conducted by Amidon and Flanders (1961) in which the performance of many of these behaviors was systematically varied in direct and indirect influence teaching styles.

Amidon and Flanders have reported that when teachers utilizing indirect and direct influence styles were compared, it was found that indirect teachers performed about twice as much questioning and clarifying behavior and that direct teachers often performed about twice as much direction giving. In addition, praise or encouragement generally constituted about two to five percent of the instructor communication behavior. Corrective feedback levels were found to range from one to five percent.

Hypotheses

As noted in the preceding pages, research relating dogmatism level to academic achievement has produced mixed results. Two variables that have often not been controlled for in these studies have been the communication style of the teacher and the cognitive skill level required of the student.

The research of Amidon, Flanders, Hough and their students succeeded in rigorously differentiating between the proportionate performance of various communication behaviors in direct and indirect influence teaching styles. However, their studies failed to control for the personality or belief system variables of learners. Thus the present research was designed to determine how the differential performance of selected communication behaviors affected the preference for and achievement within a synthesis learning task of high and low dogmatic students.

The research findings of Rokeach, Oram, Laffey and Denny (1960), Christensen (1963), Zagona and Zurcher (1964, 1965), and Byrnes (1968) were shown to indicate that high dogmatic students might significantly prefer but only achieve slightly more with a one-way communication style which emphasized the giving of information and direction and minimized the necessity for verbal interaction with the tutor. However, these same research studies suggested that low dogmatics might show both significantly greater preference and achievement with a two-way communication style which emphasized the tutor's performance of questioning and clarifying behavior and also increased the student's amount of verbal participation in a tutorial session. Thus it was felt the two-way communication style would significantly facilitate the synthesis learning of low dogmatic students and slightly inhibit that learning for high dogmatics. In addition the two-way communication style would significantly increase and decrease the respective preferences of the low and high dogmatic students to maintain a continuing tutorial relationship.

A continuing tutorial relationship was defined as an interpersonal relationship which is founded upon the preference of the student to meet again with the tutor after the initial session and as one that varies in its duration according to the perceived need of the student. Previous research concerning interpersonal attraction (Festinger, Schachter, and Back, 1950; Schachter, 1959; Glass, 1964; Berscheid, Boye and Darley, 1968) had found it to be associated with the satisfaction of individual needs for affection, approval, support and prestige, and also correlated with the facilitation and coordination of individual goal attainment (Thibaut, 1950; Gilchrist, 1952; Golembiewski, 1962; Zander and Wolfe, 1964; Hughes, 1965). In addition, a study by Costley (1964) of attraction in three-man discussion groups had shown that personal attraction, coordination of effort, and satisfaction with outcomes were highly intercorrelated while task attraction did not correlate significantly with any of the three measures. Therefore, in this study two dimensions of a student's preference to maintain a continuing tutorial relationship were measured: 1) task attraction and 2) interpersonal attraction.

The task attraction dimension concerned the student's perception of the tutor's success in generating interest and enthusiasm in the subject matter being studied. The interpersonal attraction component measured personal attraction, coordination of effort, and satisfaction with tutorial outcomes. Personal attraction concerned the needs of the student for consideration, support, and friendship. Coordination of effort referred to the ease with which the student and the tutor were able to work together as a problem solving team. Satisfaction

with outcomes concerned the extent to which the student perceived that his academic achievement was being facilitated by the tutor's assistance.

It was felt that the differential preferences of high and low dogmatic students to engage in verbal interaction with instructors would affect evaluations of task and interpersonal attraction when one- and two-way communication styles were experimentally manipulated. In addition it was felt that the emphasis upon information and direction giving and questioning and clarifying statements in the one- and two-way styles, respectively, would differently affect the synthesis learning of high and low dogmatic students. Thus the following hypotheses were made:

- H 1: For high dogmatic students, the one-way communication style is significantly more effective than the two-way communication style in achieving the task attraction dimension of a continuing tutorial relationship.
- H 2: For high dogmatic students, the one-way communication style is significantly more effective than the two-way communication style in achieving the interpersonal attraction dimension of a continuing tutorial relationship.
- H 3: For low dogmatic students, the two-way communication style is significantly more effective than the one-way communication style in achieving the task attraction dimension of a continuing tutorial relationship.
- H 4: For low dogmatic students, the two-way communication style is significantly more effective than the one-way communication style in achieving the interpersonal attraction dimension of a continuing tutorial relationship.
- H 5: For low dogmatic students, the two-way communication style is significantly more effective than the one-way communication style in achieving improved synthesis learning during an initial tutorial session.

CHAPTER II

METHODOLOGY

This chapter includes sections dealing, respectively, with the sample of subjects, the research setting and data collection procedures, the independent variables, the dependent measures, and the experimental design of the study.

Sample

The ideal population from which to sample for a study of effective tutoring would have been composed of students who were currently receiving tutorial assistance. However it was not possible to secure such a population during the ten week summer session because most students were away from the campus for the summer. Therefore an introductory freshman course, Anthropology 100, was designated to be the research population.

The subjects were selected on the basis of their scores on the twenty-item Dogmatism Scale (Troidahl and Powell, 1965) which was administered during regular class time to the two sections of Anthropology 100. One hundred and sixty-three completed questionnaires were received from the students. These were scored, rank ordered, and divided into tertiles consisting of 54, 55, and 54 low, intermediate and high dogmatic students. The range of the scores in the low,

intermediate and high dogmatic tertiles was 27-53, 54-63, and 64-106, respectively. Forty subjects were randomly selected from each tertile and randomly assigned to the two experimental treatments.

The experimenter returned to the two sections of this course two weeks later and read the names of the 120 students who had been randomly selected and assigned. Fifty-eight of these students volunteered to participate at this time and twenty more volunteered to participate after return visits to the classes and telephone requests were made. Only seven of these eighty subjects failed to appear, and one subject had to be dropped from the sample because he was a friend of the experimental tutor. Thus the total sample used in the study consisted of seventy-one subjects. The subjects were paid two dollars each for participating in the study. It was felt that the two dollar payment helped to secure subjects and prevent any major attrition of the sample. In addition, conversations with the subjects after the experiment revealed that most of them participated not for the money alone, but because the study aroused their curiosity. In fact, several of the subjects refused to accept the two dollar payment when it was offered.

Research Setting and Data Collection Procedures

This section will provide a description of the information which the subjects were given about the purposes of the study and a description of the experiment.

Communication to Subjects

At t_1 , when the twenty-item Dogmatism Scale (Troidahl and Powell, 1965) was administered during class time in Anthropology 100, and at t_2 , when the one hundred and twenty randomly selected persons were announced, the students were told that the experimenter needed students to evaluate an adult game in a summer pretest to determine whether it would be feasible to use the game in a research study to be conducted in the fall, 1970. The experimenter said he wanted to find out whether students found the game interesting and enjoyable and whether it was possible to utilize different methods to thoroughly teach students how to play the game in forty-five minutes to one hour. In addition, the students were told that the experimenter wished to randomly select persons having different attitudes about social and personal issues so that a representative sample of college students could be obtained. The latter point was added to provide a reason for the administration of the twenty-item Dogmatism Scale.

The Experiment

The experiment itself was conducted in classrooms on the first floor of the Auditorium between July 30 and August 15, during weekday evenings (6:00 PM--9:00 PM) and on Saturday mornings (10:00 AM--12:00 PM) (Figure 1). The five to eight subjects who participated each day were scheduled to arrive at fifteen minute intervals. This time interval between subject arrivals allowed the tutor a short break between tutorial sessions and prevented waiting periods for the subjects.

FIGURE 1.--Location of the rooms in which the experiment was conducted.

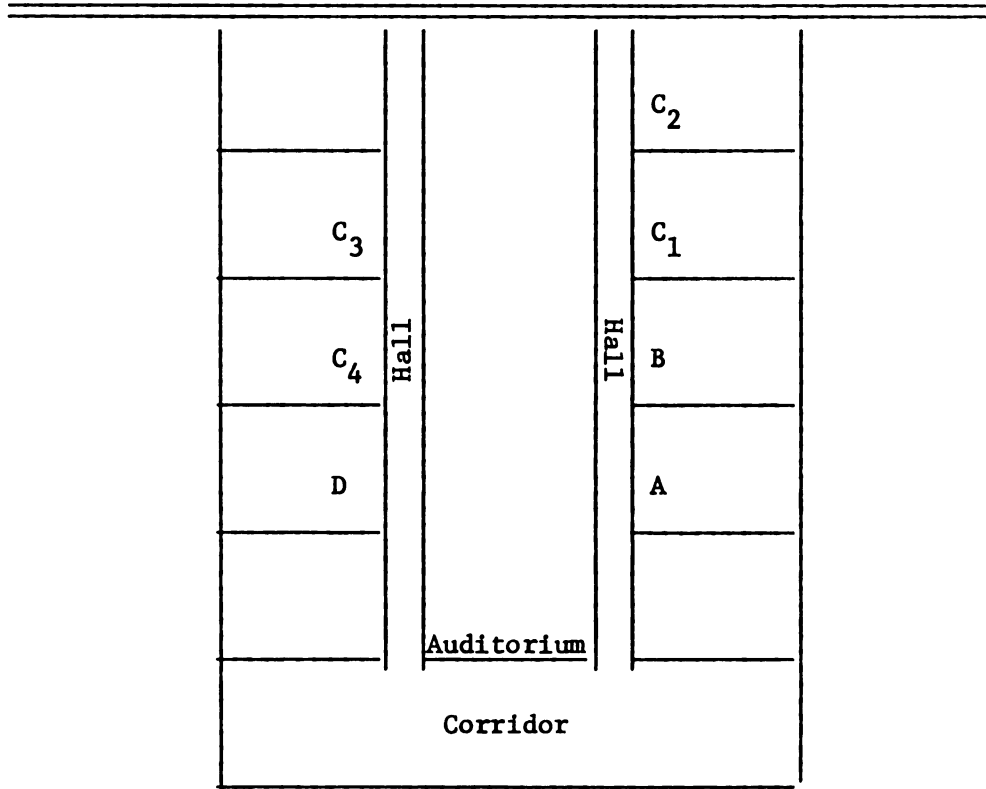


Table 1 shows the sequence of the activities participated in by each subject.

Upon their arrival to the Auditorium, at t_3 , the subjects were taken by the experimenter to room A, where they were introduced to a research assistant. This assistant gave the subject a one-page hand-out which reaffirmed the information they had previously been given in their Anthropology 100 classes about the purposes of the study (Appendix A).

After the subjects had finished reading the introductory handout they were given five minutes, t_4 , to read the four page game instructions handout about how to play a modified version of a game called "Foil" which has been copyrighted by the 3M Company of St. Paul, Minnesota (Appendix B). The object of the Foil game is to arrange letter cards to form words, then scramble each of the words so that opponents will not be able to unscramble them in the allotted three minute time period.

At the conclusion of the five-minute reading period, the subjects were allowed ten minutes, t_5 , to complete a sixteen item game simulation quiz (Table 1). The quiz items measured the subjects' abilities to solve problems requiring an analysis of the rules and scoring procedures of the game (Appendix C). The sixteen quiz items were constructed on the basis of pretesting to be extremely difficult to solve after only five minutes of individual reading. None of the thirty actual pretest subjects had been able to answer the quiz items after reading the game instructions for only five minutes.

TABLE 1.--Sequence of subject's activities.

Time	<u>t</u>	Activity	Room
During class period of Anthropology 100	t_1	Administration of Dogma- tism Scale.	-----
During class period of Anthropology 100	t_2	Announcement of subjects selected.	-----
5:58	t_3	Subject arrives and receives introductory handout.	A
6:00 - 6:05	t_4	Subject reads game instructions.	A
6:05 - 6:15	t_5	Subject takes game simulation quiz.	A
6:15 - 6:25	t_6	Subject receives tutoring.	B
6:25 - 6:35	t_7	Subject retakes game simulation quiz.	C_1, C_2, C_3, C_4
6:35 - 6:45	t_8	Subject completes tutor evaluation questionnaire.	C_1, C_2, C_3, C_4
6:45 - 7:00	t_9	Subject plays game.	C_1, C_2, C_3, C_4
7:00 - 7:15	t_{10}	Subject completes game evaluation questionnaire.	D

The five-minute period of individual study and the quiz were designed to simulate a real life situation where a student might attempt to learn academic material by his own efforts before seeking tutorial assistance. In addition, the pretesting had demonstrated that the subject's failure to comprehend the game instructions and successfully complete the quiz items would stimulate feelings of failure and incompetence which mirror the feelings experienced by students who in real life request tutorial assistance. Thus the purpose of the "evaluation of an adult game" deception was to arouse feelings of frustration, anxiety, failure, etc., within the subjects that would simulate the affect of a student who in real life comes to an initial tutorial session. It was felt that this deception would insure that the subjects would respond to the experimental tutor in the same manner that students might respond to a real tutor.

When the game simulation quiz period was concluded the subjects were taken to an adjoining classroom, room B, where they were individually tutored for ten minutes, t_6 , by a male undergraduate senior who performed either the one-way or the two-way communication style. As the experimenter escorted the subjects to room B he told them they would receive a similar quiz after the ten minute tutorial session was concluded. The experimenter then introduced the subjects to the tutor and the timer. The experimenter instructed the subjects that their sessions with the tutor would be tape-recorded by the timer so that the questions most people had about the game could be determined.

The timer sat behind the subject facing the tutor. At the half-way point of the tutorial session, the timer held up a card indicating

that five minutes remained. He later showed similar cards to the tutor indicating that two and finally one minute remained. At the conclusion of the ten minutes the timer said, "That's it," and turned the switch of the microphone for the cassette recorder to the off position.

Upon the conclusion of the ten minute tutorial sessions, the subjects were taken by one of four additional research assistants, the "game players," to a third room (either room C_1 , C_2 , C_3 , or C_4) to actually play a hand of the Foil game (Figure 1 and Table 1). Before actually playing the game, however, the posttest measurement of the game simulation quiz was administered, t_7 ; once again the subjects were allowed ten minutes to complete the quiz. After completing the quiz, the subjects were given the tutor evaluation questionnaire to fill out, t_8 (Appendix D). The subjects were allowed as much time as they desired to complete the sixteen items measuring the task and interpersonal attraction dimensions of a continuing tutorial relationship.

After a subject had completed these two questionnaires, he and the game player proceeded to play a hand of the game, t_9 (Table 1). During the playing of the hand, the subject was not allowed to ask any questions. Rather, using the game procedures questionnaire, the game player asked the subject twenty questions that were designed to cover every point of information that an individual would need to know in order to play the game (Appendix E). If the subject could not respond or responded incorrectly to a question, the game player told the subject the correct answer. This procedure insured that

all subjects would have the same information with which to play the game.

The research assistants who were game players were instructed to tell the subjects that questions from them would not be answered because the experimenter wished to determine the success of the other methods of teaching the subjects to play the game. Thus it was necessary to insure that no subjects received a disproportionate advantage. If a subject forgot this ground-rule and later asked a question, the game players were instructed to politely tell him that they were not allowed to answer any questions.

The Foil game is divided into two distinct phases: the word formation-knocking phase and the scrambling-unscrambling phase. The subjects were allowed to draw four times from either the deck or the discard pile in order to form the words required for knocking. If the subject had not knocked by this time the game player did so with the words "FORCES" and "AXLE." Then, after the scrambling-unscrambling phase of the game was completed, the game player added up the total number of points the subject had earned for the hand (Appendix F). The subject's total game playing score served as the measurement of his synthesis learning.¹

After the subjects and the game players had finished playing a hand of round one of the Foil game, the latter took the former to a fourth and final classroom, room D. Here at t_{10} , the subjects completed the final questionnaire in which they evaluated the game in regard to its interest, enjoyment, etc., for them (Appendix G). The

¹For further discussion of this synthesis learning task, see pages 50-52.

subjects were instructed in this questionnaire that the results of the pretest would be mailed to their fall mailing address if they would kindly enclose it. Seventy of the seventy-one subjects provided this latter information.

After the subjects completed this final questionnaire they were paid two dollars by the experimenter. The subjects were not told about the experimental deception at this time. The experimenter wished to avoid having the subjects tell their classmates about the purposes of the study while the experiment continued throughout the two-week period. Since all of the subjects were drawn from the two sections of Anthropology 100, the experimenter feared that subjects who were scheduled to appear later in the study might be biased if such information was given out earlier. In fact, only about ten subjects asked the experimenter what the real purpose of the study was. Thus it appeared that the deception was successful. An explanation of the deception and the purposes of the study was mailed to those subjects who listed their fall mailing addresses in the final questionnaire.

Independent Variables

The two independent variables used in this study were the communication style of the tutor and the dogmatism level of those being tutored. Dogmatism was operationalized as scores on the short form of the Rokeach Scale. Two communication styles were used. In the one-way communication style, sixty-two percent of the tutor's total verbal communication during a tutorial session consisted of information and direction giving behavior while thirty-one percent consisted of

questions and clarification statements. In the two-way communication style these percentages were reversed. Thus in this latter style, sixty-two percent of the tutor's total verbal communication consisted of questioning and clarifying behaviors while thirty-one percent consisted of information and direction giving behavior.

The tutor was allowed a specified degree of variability in his performance of the two styles. The error margins that were allowed recognized that it was virtually impossible for a tutor to allocate an exact percentage of his total verbal communication to the performance of six behaviors while he was engaged in helping a subject to overcome learning difficulties. The percentages and error margins allowed for the performance of the six behaviors are presented in Table 2. In addition, the definitions of each of the six tutor communication behaviors are given in Table 3.

Administration of the Experimental Manipulations

The one-way and two-way communication styles were administered by a single tutor to all seventy-one subjects. The hypotheses in this study concerned the effects of communication style and level of student dogmatism upon academic achievement and the interpersonal elements of a continuing tutorial relationship. Therefore it was felt that as long as the reliability of the performance of the two styles was adequate, any personality or other idiosyncratic characteristics of the tutor would not be germane to the research problem in this study. If any bias was introduced by the idiosyncratic characteristics of the tutor, it was assumed that such bias would be introduced

TABLE 2.--Communication behavior percentages for the one-way and two-way communication styles.

	One-Way	Two-Way
1. Information giving)		
2. Direction giving)	62% $\pm$ 10%	31% $\pm$ 10%
3. Corrective feedback	2% $\pm$ 2%	2% $\pm$ 2%
4. Praise or encouragement	5% $\pm$ 4%	5% $\pm$ 4%
5. Question asking)		
6. Cognitive and skill clari-)	31% $\pm$ 10%	62% $\pm$ 10%
fication and acceptance)		

TABLE 3.--Definitions of tutor communication behavior.

-
1. Information Giving: This behavior included all tutor statements about content or procedure that gave fact, data, and/or opinion (e.g., "You receive 15 points for knocking"); it also included the use of rhetorical questions.
 2. Direction Giving: This behavior included the requests, orders or commands of the tutor with which the compliance of the student was expected (e.g., "Now, let's talk about the word formation rules").
 3. Corrective Feedback: This behavior consisted of phrases such as "No," "That's incorrect," etc., when such phrases were followed by tutor information and direction giving behavior which informed a student of the incorrectness or inappropriateness of the latter's behavior by making reference to clearly identifiable authority (i.e., definition, common convention or empirically validatable fact).
 4. Praise or Encouragement: This behavior included tutor statements of approval or support directed at student behavior. Tutor statements for current behavior as well as for past or predicted future behavior were included in this category. Tutor statements which indicated agreement with student ideas were also included in this category. However, when statements like "um hum," "go on," and "OK" represented habitual tutor behavior and were not said with an inflection that connoted approval or support they were included in the information giving category.
 5. Question Asking: This behavior pertained to all tutor interrogatory statements for which student answers were expected (e.g., "How many points do you receive for forming four or more words?").
 6. Cognitive and Skill Clarification and Acceptance: This behavior included the statements of the tutor which developed or built upon the ideas or suggestions of the student (e.g., Student: "You can draw as many cards as you wish from the discard pile." Tutor: "As long as they are drawn consecutively"). Statements which repeated or paraphrased what a student had said or that were designed to help a student think through what he had said or done were also included in this category (e.g., Student: "You can knock in round two when you have used all of your cards to form words." Tutor: "And when." Student: "And when one word contains at least six letters").
-

systematically for the subjects in each of the style and dogmatism conditions.

Approximately four weeks were spent in training the tutor to reliably perform the two communication styles. The tutor practiced the two styles on thirty pretest subjects before the experiment began.

During the experiment the tutor performed the two styles on alternate evenings. However, due to the fact that it was necessary to reschedule some subjects who missed their first appointments, the tutor sometimes performed the two styles with alternate subjects in the same evening. The tutor reported that this presented no difficulty for him. He also reported that the only task which required concerted effort on his part was that of making his performance with each new subject appear as fresh and as enthusiastic as it had with the previous subject.

Reliability

The reliability of the experimental manipulations was evaluated by a continuous coding procedure. The tape of a ten-minute tutorial session was first transcribed to identify each of the periods of tutor talk during the session. Then the tape was replayed and each period of tutor talk was coded into either the information and direction giving, the corrective feedback, the praise or encouragement, or the question and clarification categories. In addition, each period of tutor talk was timed with a stop-watch. Tutor statements such as "yes," "no," "OK," "go on," etc., were by convention recorded as being

one-half second in duration unless the tutor clearly spent more time enunciating them.

Twelve of the ten-minute tutorial session tapes were randomly selected for coding, two from each of the six dogmatism and communication style conditions. The reliability coding was performed by two female students who coded each of the tapes independently. The results of the coding demonstrated that the tutor did reliably perform the one-way and two-way communication styles on each of the twelve tapes that had been randomly selected. The tutor's performance of each of the behaviors in the styles was found by both coders to be within the error margins specified for the behaviors. In addition, the inter-coder reliability as calculated by the Pearson product-moment correlation coefficient was found to be .91.

Dependent Measures

Two dependent measures were used to determine the effects of the one-way and two-way communication styles with subjects of varying dogmatism levels: the tutor evaluation questionnaire and the game playing score. The tutor evaluation questionnaire measured the task and interpersonal attraction dimensions of a continuing tutorial relationship, and the game playing score measured synthesis learning.

Tutor Evaluation Questionnaire

This questionnaire was used to determine the effects of the two communication styles upon the task and interpersonal attraction dimensions of a continuing tutorial relationship (see pages 28 and 29).

The subjects evaluated the tutor on sixteen items using a seven-point scale ranging from completely agree to completely disagree (Appendix D). The questionnaire items for the task and interpersonal attraction dimensions were adapted from a measure of group attraction developed by Miller and Costley (1963).

Reliability and Validity of the Tutor Evaluation Questionnaire

The reliability and content validity of the task and interpersonal attraction dimensions of a continuing tutorial relationship were determined by a factor analysis of the sixteen items on the tutor evaluation questionnaire (Table 4 and Appendix D). In the two factor rotated solution, the loadings on the first factor for items 1-5 and 9-16 were high and pure (Table 5). This first factor clearly appeared to measure interpersonal attraction and it explained 35 percent of the common variance among the sixteen items. The loadings for items 6 and 8 on the second factor were also high and pure. This second factor measured task attraction and accounted for 15 percent of the common variance. Thus the total variance explained by the factors one and two of the two factor rotated solution was fifty percent.

Only item seven loaded highly on both factors of the twice rotated solution (Table 5). This item (i.e., "I enjoyed learning how to play this game") thus appeared to be ambiguous in its meaning for it could be viewed as an indicant of either interpersonal or task attraction. However, this item failed to load highly on the second factor in the three and four factor rotated solutions while the loadings for items six and eight on the second factor did remain high and pure in these

TABLE 4.--The sixteen items in the tutor evaluation questionnaire.

-
-
1. If I were to participate in another tutorial session of this type I would prefer to be with a different tutor (Item reflected).
 2. The tutor was considerate of my feelings during the ten minute tutorial session.
 3. There was a friendly atmosphere during the tutorial session.
 4. I like the person who tutored me.
 5. The tutoring made learning how to play this game interesting.
 6. If I were to participate in another project of this type I would prefer to be tutored about a different adult game (Item reflected).
 7. I enjoyed learning how to play this game.
 8. I would like to spend more time learning how to play this game.
 9. The tutor was uncooperative (Item reflected).
 10. The tutor and I agreed with each other on most things.
 11. The tutor and I worked together to achieve a common objective.
 12. The tutor and I worked together as a team.
 13. The tutor and I accomplished as much as could have been expected in the limited time of ten minutes.
 14. I was not satisfied with the results of this tutorial session (Item reflected).
 15. I would be willing to try to convince my friends that a tutorial session is an effective means of teaching someone to play this game.
 16. I would be willing to have my name made public in support of the position that a tutorial session is an effective means of teaching someone to play this game.
-

TABLE 5.--Factor loadings for the two factor rotated solution.

	Factor 1	Factor 2
1.	.58	.13
2.	.52	.25
3.	.71	.22
4.	.70	.38
5.	.67	.48
6.	-.04	.77
7.	.61	.60
8.	.13	.88
9.	.55	.20
10.	.35	-.03
11.	.62	.27
12.	.61	.11
13.	.77	-.03
14.	.77	.07
15.	.65	.16
16.	.67	.03
Proportions of Variance		
	.35	.15

TABLE 6.--Factor loadings for the three factor rotated solution.

	Factor 1	Factor 2	Factor 3
1.	.55	.11	.25
2.	.05	.18	.78
3.	.45	.17	.59
4.	.50	.34	.52
5.	.61	.44	.35
6.	.05	.77	.07
7.	.59	.57	.29
8.	.17	.88	.09
9.	.25	.15	.57
10.	.14	-.06	.38
11.	.34	.22	.59
12.	.18	.04	.76
13.	.66	-.06	.40
14.	.75	.04	.31
15.	.85	.15	.01
16.	.68	.01	.23
Proportions of Variance			
	.24	.14	.20

TABLE 7.--Factor loadings for the four factor rotated solution.

	Factor 1	Factor 2	Factor 3	Factor 4
1.	.26	.02	.03	-.73
2.	.08	.15	.78	-.17
3.	.20	.07	.39	-.72
4.	.27	.26	.35	-.68
5.	.43	.40	.22	-.56
6.	.05	.81	.19	.18
7.	.39	.53	.16	-.58
8.	.06	.85	.07	-.26
9.	.21	.12	.52	-.29
10.	-.04	-.14	.24	-.45
11.	.37	.22	.58	-.19
12.	.22	.03	.75	-.17
13.	.71	.03	.38	-.18
14.	.74	.06	.26	-.30
15.	.76	.17	.08	-.36
16.	.81	.08	.26	.00
Proportions of Variance				
	.19	.13	.16	.18

rotations (Tables 6, 7). Therefore it was concluded that item seven should be included with the other items measuring interpersonal attraction.

A number of the items measuring interpersonal attraction on the first factor of the two factor solution split off onto factors three and four of the three and four factor solutions. Although these latter solutions increased the variance explained by eight and sixteen percent respectively, it was felt that factors one and three and factors one, three, and four in the three and four factor rotated solutions were neither as conceptually meaningful nor as parsimonious as the first factor in the two factor solution. Therefore it was concluded that the hypotheses concerning the interpersonal attraction dimension of a continuing tutorial relationship should be tested by items 1-5, 7, and 9-16 and that the task attraction hypotheses should be tested with items 6 and 8 from the tutor evaluation questionnaire.

Game Playing Score

The subjects each played a hand of round one of the modified version of the Foil game used in this study. The game playing score was a measurement of the subjects' synthesis abilities to create a unique problem solution by integrating the specific operations of the play, word formation, knocking, scrambling, unscrambling, and scoring

concepts.² Since it was ascertained that none of the subjects had played this game before, each problem solution formed was a unique one for the subject who created it.

Synthesis is a process of working with the concepts within knowledge or belief systems and of selectively combining the operations from two or more of these concepts to form a pattern, whole or structure not clearly there before. In this experiment the game instructions constituted the knowledge system, and the elements or parts of this system consisted of the play, word formation, knocking, scrambling, unscrambling and scoring concepts. To form a problem solution to the Foil game it was necessary for the subjects to selectively delineate and interrelate specific operations from these six concepts. For example, the subjects had to make not only words from the letter cards in their own hands (during the word formation phase) and words from the scrambled letters in the research assistants' hands (during the unscrambling phase), but also, the subjects had to identify and integrate the operations of the six concepts which were pertinent to the solution they wished to create. These operations are presented in Appendix H.

²Hunt (1962) has defined a concept as an abstraction which serves as an identifying response to members of a set of not completely identical stimuli, and Kendler (1964) has defined a concept as a common response to dissimilar stimuli which functions as a cue or mediator of learned behavior. In addition, Berlyne (1965) has stated that a concept has been learned when an overt behavior comes to depend on certain properties of a stimulus pattern while disregarding other properties. Thus a concept may be said to be an abstraction which symbolically represents a set of not completely identical operations or behaviors.

Since the subject's game playing score was the measure of his synthesis learning, control was exercised to insure that each subject played the game under the same conditions. The cards had been dealt in advance for both the subject and the game player. In addition, the top nine cards of the deck had also been selected in advance. Thus the research assistant who was the game player always received the letters A, C, E, E, F, L, O, R, S, and X which always formed into the words "FORCES" and "AXLE." This insured that each subject would have to unscramble the same words during the scrambling-unscrambling phase of the game. The subjects always received the letters A, C, D, E, I, L, N, P, Q, and U. These cards were selected to insure that there was at least one solution ("CANDLE" and "QUIP") by which the subject could complete the hand with the cards dealt to him. The nine cards that were placed on the top of the deck were A, I, H, N, O, R, S, T, and U. Since the game player always discarded the cards he drew from the deck, the subjects always made their selection from the same cards in either the deck or the discard pile.

Reliability and Validity of the Game Playing Score

The reliability of the game playing score of synthesis learning was determined by the split-half technique. The Spearman-Brown prophecy formula was used to compare the subjects' scores from the word formation and unscrambling phases of the modified version of the Foil game. The reliability coefficient was found to be .81. This coefficient indicates the internal consistency of the subjects' synthesis learning scores.

The concurrent validity of the game playing score was evaluated by computing Pearson product-moment correlation coefficients between the subjects' scores on it and their scores on two other measures of learning; the game procedures questionnaire and the game simulation quiz. These correlations were .33 and .43 respectively. Both of these correlation coefficients were significant at the .01 level, but accounted for less than twenty percent of the variance. Thus there was less consistency between the game playing score of synthesis learning and the other measures than one might like.

Concurrent Validity Measures

The two concurrent validity measures were the game procedures questionnaire and the game simulation quiz. The game procedures questionnaire consisted of twenty questions which covered each point of information that a person needed to know in order to play a hand of the Foil game (Appendix E). The game simulation quiz consisted of sixteen game-playing solutions (Appendix C). It was the subject's task to determine the point value of each solution.

The simulation quiz measured the subjects' learning at the analysis level of the cognitive domain. Analysis is a cognitive process which requires that knowledge or belief systems be broken down into their constituent concepts, so that the organization and relationships among the concepts may be discriminated. In this study the game instructions for the modified version of the Foil game constituted the knowledge system. The elements or parts of this system consisted of the play, word formation, knocking, scrambling, unscrambling, and

scoring concepts. The operations pertinent to each of these six concepts are listed in Appendix H.

The game simulation quiz presented the subjects with different solutions formed by hypothetical game players. The quiz required the subjects to analyze each of the sixteen questions in order to determine how many points had been earned by the player for each solution. For example, question number one in Appendix C would be solved in the following manner:

Player A has met the requirements for knocking in round two because he has used all of the cards in his hand to form words and one of these words (STEREO) contains at least six letters. The second word (TELL) satisfies the requirements for word formation because it contains four letters. Since neither word contains any bonus letter cards, player A receives two points for each letter card used to form words (i.e., 10 cards x 2 points = 20 points). In addition, for correctly meeting the knocking requirements, player A receives an additional fifteen points. Thus the correct answer for this question is thirty-five points.

No hypotheses were made in this study about the effects of communication style and dogmatism level upon analysis learning. The data from the studies by Rokeach, McGovney and Denny (1955) and Rokeach and Vidulich (1960) had shown that there were no significant differences between the analysis abilities of high and low dogmatic subjects. In addition, the data from these experimental studies and the classroom studies (Ehrlich, 1961; Frumkin, 1961; Christensen, 1963; Costin, 1965, 1968; Zagona and Zurcher, 1965; Byrnes, 1968) did not indicate that the analysis ability of high and low dogmatic students might be significantly increased by the tutor's performance of either the one-way or the two-way communication style. Thus there were no empirical data

upon which to make hypotheses concerning the effects of the one- and two-way styles for the analysis learning of high and low dogmatic students.

As expected, the analysis learning of the high dogmatics was not significantly increased by the one-way tutor communication style nor was it significantly increased for the low dogmatics by the two-way style. This non-significant finding for the dogmatism X style effect is shown in Table 8. In addition the findings shown in Table 8 for the style and dogmatism effects were also non-significant. These latter findings indicate analysis learning was not significantly increased by either of these two communication styles and that there were no significant differences in the analysis learning achieved by the high, intermediate, and low dogmatism groups.

Although the dogmatism, style and dogmatism X style effects were non-significant, Table 8 shows that a highly significant finding was obtained for the within subjects trials effect. This finding indicated that significant gains in analysis learning occurred between the pretest and posttest administrations of the game simulation quiz.³ The pretest was administered to the subjects at t_5 after they had read the game instructions for five minutes (Table 1). The posttest was given at t_7 after the ten minute tutorial session.⁴ An analysis of

³The three factor mixed model, with repeated measures on one factor, analysis of variance design was used to test the significance of the data on the game simulation quiz. The pretutorial and posttutorial administrations of the quiz constituted the repeated measures factor.

⁴The split-half reliability coefficients for the pre- and post-tutorial administrations of the game simulation quiz were found by the Spearman-Brown prophecy formula to be .85 and .82 respectively.

TABLE 8.--Analysis of variance of analysis learning for the six experimental conditions.

Source of Variance	ss	df	ms	F	P
Between Subjects	665.39	70			
Dogmatism	8.19	2	4.70	.43	ns
Style	15.36	1	15.36	1.61	ns
Dogmatism X Style	19.78	2	9.89	1.03	ns
Error (b)	622.06	65	9.57		
Within Subjects	1058.50	71			
Trials	725.63	1	725.63	149.31	$\leq .05$
Trials X Dogmatism	1.46	2	.73	---	ns
Trials X Style	4.95	1	4.95	1.02	ns
Trials X Dogmatism X Style	10.34	2	5.17	1.06	ns
Error (w)	316.12	65	4.86		
TOTAL	1723.89	141			

$F_{.05, df = 1, 60} = 4.0$

TABLE 9.--Tests for significant differences between two time of measurement means for dogmatism and communication style conditions.

Condition	Difference	<u>t</u>	df	P
High Dogmatism				
One-Way Style	-5.54	-6.40	12	$\leq .05$
Two-Way Style	-3.73	-3.96	10	$\leq .05$
Intermediate Dogmatism				
One-Way Style	-5.17	-5.74	11	$\leq .05$
Two-Way Style	-4.08	-4.71	12	$\leq .05$
Low Dogmatism				
One-Way Style	-3.82	-4.06	10	$\leq .05$
Two-Way Style	-4.64	-4.93	10	$\leq .05$

the mean differences from pretest to posttest was computed for each subject group by the t test (Lindquist, 1953). The findings in Table 9 show that significant gains in analysis learning were made by each of the six dogmatism and communication style groups from pretest to posttest.

Experimental Design

The treatment-by-levels analysis of variance design was used to test the significance of the five hypotheses concerning synthesis learning and the task and interpersonal attraction dimensions of a continuing tutorial relationship (Lindquist, 1953). This analysis of variance design was selected to permit a test for interaction effects.

A table of random numbers was used to randomly assign the subjects to the one-way and two-way communication style conditions (Fisher and Yates, 1954). The random assignment provided control for possible differences in the academic aptitude of subjects within the three dogmatism levels and any other extraneous variables which might affect their synthesis learning and their preference with respect to the task and interpersonal dimensions of a continuing tutorial relationship.

CHAPTER III

FINDINGS

For all statistical tests the .05 level of confidence was accepted as the basis for rejecting the null hypotheses. Analysis of the data yielded the following results.

Analysis Learning

The pretest administration of the game simulation quiz was given to the subjects after they had read the game instructions for five minutes. The posttest was administered after the ten-minute tutorial session. Table 8 shows that a highly significant finding was obtained for the within subjects trials effect. This finding indicated that there were significant differences in learning which occurred between the two administrations of the game simulation quiz. An analysis of the mean differences from pretest to posttest was computed for each subject group by the t test (Lindquist, 1953). The findings in Table 9 show that significant gains in analysis learning were made by each of the six dogmatism and communication style groups from pretest to posttest.

Test of the Hypotheses

The hypothesized effects of the one-way communication style for the high dogmatic students in regard to the accomplishment of the task (H1) and interpersonal (H2) attraction dimensions of a continuing tutorial relationship were not supported. An examination of Tables 10 and 11 shows that there were no significant interaction effects. In addition, an examination of Tables 12 and 13 shows that the differences between the means in the one-way and two-way communication style cells were in the predicted direction for task attraction, but not for interpersonal attraction. Also, the data in Table 14 indicate that the synthesis learning of the high dogmatic students was not slightly improved by the one-way communication style.

The hypotheses concerning the effects of the two-way communication style for low dogmatic students with respect to increased task (H3) and interpersonal attraction (H4) and improved synthesis learning during an initial tutorial session (H5) were not supported. Tables 10, 11 and 15 reveal that no significant dogmatism X style effects were found. However, Tables 12, 13 and 14 show that the mean differences were in the predicted direction for each of the three hypotheses.

Discussion

Since the findings for the dogmatism, communication style, and dogmatism X communication style effects were not significant, the communication behaviors which were experimentally manipulated in the

TABLE 10.--Analysis of variance of task attraction for the six experimental conditions.

Source of Variance	ss	df	ms	F	P
Dogmatism (A)	2.98	2	1.49	.14	ns
Style (B)	7.87	1	7.87	.76	ns
A X B	15.90	2	7.95	.77	ns
Error	669.66	65			
TOTAL	696.41	70			

TABLE 11.--Analysis of variance of interpersonal attraction for the six experimental conditions.

Source of Variance	ss	df	ms	F	P
Dogmatism (A)	464.02	2	232.01	1.26	ns
Style (B)	321.09	1	321.09	1.74	ns
A X B	38.50	2	19.10	.10	ns
Error	11998.33	65	184.59		
TOTAL	12821.94	70			

TABLE 12.--Means and standard deviations of task attraction in the six experimental conditions.

	One-Way Style	Two-Way Style
High Dogmatic	$\bar{X} = 10.54$ $S = 2.30$ $n = 13$	8.73 2.90 11
Intermediate Dogmatic	$\bar{X} = 9.58$ $S = 3.65$ $n = 12$	8.84 3.26 13
Low Dogmatic	$\bar{X} = 8.91$ $S = 4.04$ $n = 11$	9.45 2.91 11

TABLE 13.--Means and standard deviations of interpersonal attraction in the six experimental conditions.

	One-Way Style	Two-Way Style
High Dogmatic	$\bar{X} = 81.69$ $S = 8.88$ $n = 13$	84.09 10.11 11
Intermediate Dogmatic	$\bar{X} = 74.74$ $S = 19.80$ $n = 12$	81.69 12.18 13
Low Dogmatic	$\bar{X} = 74.45$ $S = 16.93$ $n = 11$	78.91 10.35 11

TABLE 14.--Means and standard deviations of synthesis learning in the six experimental conditions.

	One-Way Style	Two-Way Style
High Dogmatic	$\bar{X} = 27.00$ $S = 14.18$ $n = 13$	36.36 14.23 11
Intermediate Dogmatic	$\bar{X} = 25.17$ $S = 11.89$ $n = 13$	22.23 12.67 13
Low Dogmatic	$\bar{X} = 19.55$ $S = 14.22$ $n = 11$	33.36 15.51 11

TABLE 15.--Analysis of variance of synthesis learning for the six experimental conditions.

Source of Variance	ss	df	ms	F	P
Dogmatism (A)	796.81	2	398.41	.45	ns
Style (B)	803.87	1	803.87	3.79	.06
A X B	898.86	2	449.43	2.12	ns
Error	13773.79	65	211.90		
TOTAL	16273.33	70			

one- and two-way communication styles apparently did not make a difference with respect to synthesis learning and task and interpersonal attraction for high and low dogmatics. However, for synthesis learning the communication style effect favoring the two-way style approached significance (.06). In addition, the mean scores for synthesis learning and interpersonal attraction were higher for the two-way style than for the one-way style for both the high and the low dogmatics. Thus although the findings were not statistically significant, the mean differences consistently favored the two-way communication style rather than the one-way style for synthesis learning and interpersonal attraction for both the high and low dogmatic students.

The failure to find statistically significant differences between the one-way and the two-way communication styles for synthesis learning and interpersonal and task attraction may be due to the random variability of the subjects' scores. For synthesis learning the mean differences were sizeable, but the standard deviations and error terms were also very large. From the data in Table 14 it can be seen that for synthesis learning the differences between the mean scores were 9.36 for the high dogmatics and 13.81 for the low dogmatics. However, Table 14 also shows that the standard deviations in these four dogmatism and communication style cells ranged from 14.18 to 15.51 and Table 15 shows the very large size of the error term.

For interpersonal attraction, the mean differences favored the two-way communication style. However, these were not sizeable and the standard deviations and error term were relatively large. From Table

13 it may be seen that the difference between the mean scores was 2.40 for the high dogmatics and 4.45 for the low dogmatics. In addition, Table 13 also shows that the standard deviations ranged from 8.88 to 19.80 and Table 11 shows the very large size of the error term.

The differences in the mean scores for task attraction were in the predicted direction for both the high and the low dogmatics, but these differences were very slight. From Table 12 it may be seen that the difference between the mean scores was only 1.81 for the high dogmatics and only 0.54 for the low dogmatics. In addition, Table 12 also shows that the sizes of the standard deviations were quite large (2.30 to 4.04) relative to the mean differences and the mean scores. Also the error term shown in Table 10 was extremely large.

The large size of the standard deviations and error terms for synthesis learning and for interpersonal and task attraction indicated that there was great variability among the subjects' scores. In seeking the reasons for this high variability it appeared that several aspects of the research methodology may have contributed: the sample size, the use of the Foil game, and the experimental design.

The small n's in each of the dogmatism and communication style cells were probably a contributing factor to the large error terms. Of course, one might have expected that the smaller the sample size the larger the error term would be.

The use of the Foil game may have also contributed to the random variability. Since the subjects were learning a game rather than

content material from a course in which they were enrolled there may have been lower ego involvement than there would have been for other tasks which the subjects may have considered more important.

A treatments-by-subjects design would have given greater control over the random variability than the treatments-by-levels analysis of variance design used in this study. The latter design had been selected because it was assumed that the subjects' prior experience playing other word games would not affect their ability to learn the Foil game since it was a new game for them (none of the subjects had, in fact, played the Foil game before). However, the wide variation of the synthesis learning scores indicated that differences in the ability levels of the students may have increased the random variability. This source of random variability could have been eliminated if a treatments-by-subjects design had been used since each subject would have served as his own control. The use of this design would, of course, have required that two equivalent learning tasks be developed. The treatments-by-subjects design was not originally selected because of the difficulty in standardizing two different tasks of equal complexity.

Besides the factors that may have contributed to the random variability, there also appeared, in retrospect, to be other aspects of the research methodology that may have accounted for the failure of the findings for the two-way communication style to reach statistically significant levels. These aspects concerned the difference between the communication styles, the tutor's performance of the two styles, and the tutor's nonverbal communication behavior.

It is possible that the one-way and the two-way communication styles were not sufficiently different. The two-way communication style permitted as much as 41 percent of the tutor's total verbal communication behavior to be allocated to information and direction giving. Since the non-significant findings favored the two-way style, perhaps these differences would have been significant had less information and direction giving been allowed in that style. Thus the criterion level set for information and direction giving in the two-way style ($31\% \pm 10\%$) may have been too high.

The tutor's performance of the communication styles may have been affected by his preference for one of the styles. If the tutor had preferred the one-way style, this preference might have reduced the effectiveness of his performance of the two-way style relative to that of the one-way style. While it was not determined at the conclusion of the study whether the tutor preferred either of the styles, the tutor did indicate that he found it easier to perform the one-way communication style. Only a single tutor had been used in this study because of the difficulty of training two or more persons to perform the two communication styles in the same manner.

It is also possible that the nonverbal code may have tended to offset some of the differences induced by the verbal code. If so, the tutor's nonverbal communication behavior may have affected the results, particularly for interpersonal attraction. In this research only the tutor's verbal communication behavior was studied. The tutorial sessions were thus recorded on audio rather than video tape. Therefore it was not possible to determine whether the tutor's nonverbal

communication behavior did offset the effects induced verbally by the two-way communication style.

Summary

The subjects in each of the six dogmatism and communication style conditions made significant gains in analysis learning during the tutorial sessions. In addition all of the subjects demonstrated synthesis learning in their playing of the Foil game. However, the findings for the dogmatism X style effect were not significant for the five hypotheses tested. In addition, the main effects for communication style and dogmatism were not statistically significant, although for synthesis learning the communication style effect approached significance (.06). Though not reaching statistical significance the findings favored the two-way communication style rather than the one-way style for synthesis learning and interpersonal attraction for both the low and high dogmatic students.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

This research was conducted to study the effects of communication style and level of student dogmatism in regard to synthesis learning achieved during an initial tutorial session and in regard to the task and interpersonal attraction objectives of a continuing tutorial relationship.

Synthesis Learning

Synthesis was defined as a cognitive process which consists of working with the concepts from knowledge or belief systems in such a manner that specific operations from two or more concepts are selectively abstracted and integrated to form a pattern, whole or solution not clearly there before. In this experiment the game instructions for the modified version of the Foil game constituted a knowledge system (Appendix B). The elements or parts of this system consisted of the play, word formation, knocking, scrambling, unscrambling and scoring concepts. The operations pertinent to each of these six concepts are presented in Appendix H.

The synthesis task for the subjects in this experiment was to play a hand of round one of the Foil game and to create a novel

problem solution. Since none of the subjects had played this game before, each solution was a unique one for the subject who formed it. This synthesis task required the subjects to selectively abstract and integrate operations from the six concepts as they formed words from the letter cards in their own hands and from the research assistants' scrambled letters. Control procedures were instituted to insure that each subject was given the same cards with which to form a synthesis solution (see pages 50-52).

Task and Interpersonal Attraction

A continuing tutorial relationship was defined as a relationship which is founded upon the preference of the student to meet again with the tutor after the initial session and as one that varies in its duration according to the perceived need of the student. Two dimensions of a student's preference to maintain a continuing tutorial relationship were measured in this study: task attraction and interpersonal attraction.

The task attraction dimension concerned the student's perception of the tutor's success in generating interest and enthusiasm in the subject matter being studied. The interpersonal attraction component measured personal attraction, coordination of effort and satisfaction with tutorial outcomes. Personal attraction concerned the needs of the student for consideration and support. Coordination of effort concerned the ability of the student and tutor to work together as a problem solving team. Satisfaction with outcomes referred to the

student's perception of whether his academic achievement was being facilitated by the tutor's assistance.

The questionnaire items for the task and interpersonal attraction dimensions of a continuing tutorial relationship were adapted from a measure of group attraction developed by Miller and Costley (1963) (Appendix D). A study by Costley (1964) of attraction in three-man discussion groups had shown that personal attraction, coordination of effort, and satisfaction with outcomes were highly intercorrelated while task attraction did not correlate significantly with either of the other three measures.

Results

The subjects in each of the six conditions achieved significant gains in analysis learning during the tutorial sessions (Tables 8 and 9). In addition, all of the subjects demonstrated synthesis learning in their playing of the Foil game. However, the data failed to provide support at the .05 significance level for the hypotheses concerning the experimental effects of communication style and dogmatism level upon task and interpersonal attraction and synthesis learning.

Task Attraction

The hypothesized effects of the one-way communication style for the high dogmatic students (H1) and the two-way style for the low dogmatic students (H3) with respect to the task attraction dimension of a continuing tutorial relationship were not supported. Besides the non-significant interaction effect, the data in Table 10 also failed

to show any significant communication style or dogmatism effects. Although the differences between the means in the one-way and the two-way communication style cells were in the predicted direction for both the high and the low dogmatism groups, these mean differences were slight and the standard deviations were quite large (Table 12).

Interpersonal Attraction and Synthesis Learning

The data did not show significant interaction effects for the hypotheses concerning interpersonal attraction (H2 and H4) and synthesis learning (H5) (Tables 11 and 15). In addition, the main effects for communication style and dogmatism were not statistically significant, although for synthesis learning the communication style effect approached significance (.06). Though not reaching statistical significance the findings favored the two-way communication style rather than the one-way style for synthesis learning and interpersonal attraction for both the low and the high dogmatism groups.

Recommendations for Research

Several recommendations were suggested for future research concerning the one-way and the two-way tutor communication styles. In future research it was felt that consideration should be given to the possible reduction of the amount of information and direction giving which the tutor is permitted to perform in the two-way communication style. In addition, it was also felt that researchers might study the effects of the tutor's nonverbal communication behavior when using the one-way and the two-way styles in tutorial sessions.

Furthermore, it was recommended that the random variability of the subjects' responses might be reduced if a treatments-by-subjects experimental design was employed and if the content materials selected for the two equivalent learning tasks were derived from courses in which the subjects were actually enrolled. This latter recommendation recognized that it might be very difficult to develop two equivalent learning tasks and to obtain a measure of entry knowledge.

Recommendations for Action

Based on the findings of this research two recommendations were made for tutors. Recognizing that statistically significant findings were not achieved, one could not recommend one communication style over the other. However, since the mean differences consistently favored the two-way style rather than the one-way style for synthesis learning and interpersonal attraction for both the high and the low dogmatism groups, tutors are advised to give consideration to the use of a style emphasizing questioning and clarifying behavior. Nevertheless, in the face of non-significant results, it also might be argued that tutors and students might do well to jointly decide upon their preferred communication style for tutorial sessions.

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APPENDICES

APPENDIX A

APPENDIX A

INTRODUCTORY HANDOUT

In this study we are pretesting a new adult game which we hope to use in some research to be conducted next fall. Since it is necessary that the adult game used in the research next fall be one that students really enjoy playing, we have asked you to evaluate it for us.

If we decide to use this game, it will be necessary to teach students how to play the game. Thus, in addition to finding out whether students enjoy playing the game, we also hope to find out which single method or combination of teaching methods will enable students to rapidly and thoroughly learn how to play the game.

The first method we would like you to utilize in learning this game is to read the game instructions. Since our time tonight will be limited you will have only five minutes to read these instructions. We suggest that you read rapidly. At the end of the five minutes we will give you a quiz to see how much of the game you were able to pick up with five minutes reading.

APPENDIX B

APPENDIX B

GAME INSTRUCTIONS

The object of the game you are about to learn is to arrange letter cards to form words and then to scramble each of the words so that your opponents will not be able to unscramble them in the allotted time. From two to four players may play this game at any one time. After each hand has been scored, the deal passes to the left. Each player draws a line across his paper to indicate the start of a new hand. After each player has dealt once, the round is complete and round scores are totalled. The player with the highest score at the end of the three rounds is the winner of the game.

The card tray is placed in the center of the table and the timer is positioned upright for the unscrambling. Each player must have a pencil and a sheet of paper on which he marks a column for each player, writing his own name above the first column and the names of the other players above the other columns. Each player is given a word holder and one player is chosen to keep score.

When the game is played, the dealer shuffles the deck and deals ten cards to each player. The remaining cards are placed face down in one compartment of the card tray. The top card is turned over and placed in the other compartment to start the discard pile. Starting with the player to the dealer's left, each player in turn either draws one card from the deck or as many consecutive cards as he wishes from the discard pile. After drawing, each player must discard one card

(unless he is "knocking" in which case the player is not required to discard).

After receiving ten cards from the dealer, each player begins immediately to group his letter cards in an attempt to form words. Each player may form as many words as he wishes. There is no limit upon the number of words that a player may form. A player receives two points for each letter in a word that he has formed. Each bonus letter card used to form a word counts five points. In addition, a player receives an additional five points if he forms four or more words and an additional ten points if he forms a single word from all of the cards in his hand.

As a player collects cards which will help him form words, the player should be cognizant of the rules for forming words. Contractions, abbreviations (except for commonly accepted ones which require no periods, such as "memo") and hyphenated words may not be used. Proper names and capitalized words may be used only if the players so decide before the start of the game. In addition, each word formed by a player must contain a minimum of four letters unless it is a plural form ending in "s"; a word of the latter kind must contain six or more letters. And finally, a player must not misspell a word or form a non-existent word (according to a dictionary). If a player violates any of the above rules in forming a word, he does not receive any points for that word. Also, a player loses the points he has earned for forming a word if he is not able to unscramble it after the unscrambling phase of the game is completed.

The word formation phase of the game ends when one player "knocks" on the table. To knock a player must use all of his cards to form words, and he must have at least one word of the required size. In round one a player must have at least one word containing a minimum of five letters. A player must have a word containing six or more letters in round two and a word containing a minimum of seven letters in round three. The player who knocks receives fifteen points. Other players with no unused cards receive ten points.

A player must draw a card before knocking but is not required to discard, although he may discard if he wishes. A player who has not used all of his cards and/or does not have at least one word of the required size is not qualified to knock. If he knocks before he is qualified, the player immediately has fifteen points deducted from his score and play continues until a player completes the requirements for that round. However, if it is found after the unscrambling phase of the game is completed that the player who knocked violated any of the rules of word formation, that player does not have fifteen points deducted from his score. Rather, he merely loses the fifteen points he earned for knocking.

After one player has knocked, the "scrambling" phase of the game begins. However, before the players scramble the letter cards of their words, they may rearrange their cards in an attempt to use as many as possible in forming words. If the player who knocked rearranges his cards, he must be sure to retain at least one word of the required size. The scrambled letters of each word are placed in the word holder so that all the letters are visible and so that the letters of each word

are kept distinct from those of another. Unused cards are set aside. If a player fails to follow any or all of these rules in scrambling a word, he loses the points that he earned for forming that word. In addition, if the player who knocked fails to follow the scrambling rules, he loses the extra fifteen points he earned for knocking.

When the players have placed all their scrambled words in the word holders, the unscrambling phase of the game begins. Each player turns his word holder so that his opponents can see the scrambled letters of his words. The dealer sets the three-minute timer (turns it over) and each player immediately writes his own words under his name on his paper. The players then attempt to unscramble as many of their opponents' words as possible.

In unscrambling their opponents' words, the players must follow the unscrambling rules. These rules specify that a player cannot touch or rearrange his opponents' letter cards. The player must perform the unscrambling in his head or on a piece of scratch paper. In addition, a player must unscramble each of his opponents' words separately. Also, a player must comply with each of the rules for forming words in unscrambling his opponents' words. If a player fails to follow these rules in unscrambling his opponents' words he receives zero points for the word or words involved in the violation.

When the three-minute timer has expired the dealer announces that the unscrambling must immediately cease. Each player then arranges his scrambled letter cards into words and all players check their lists. Any questions on words or spelling should be brought up at this time. A dictionary may be used to settle any disputes.

A player receives one point for each letter in an opponent's word that he has unscrambled. If, from his opponent's letter cards, a player unscrambles a word which is different from the one his opponent had in mind the player scores points for unscrambling the word. Also, if a player forms a word which no opponent unscrambles, he receives ten points.

APPENDIX C

APPENDIX C

GAME SIMULATION QUIZ

Since you have worked with this game for only a limited period of time, you are not expected to answer each question correctly. Please do your very best and be sure to ANSWER ALL OF THE QUESTIONS. If you are not sure of the correct answer to a question we want you to GUESS. There is no penalty for wrong answers.

The questions have been designed to measure your BASIC UNDERSTANDING of the game as well as your ability to determine total point scores. So please READ EACH QUESTION VERY CAREFULLY to determine whether the requirements for forming words, knocking, etc., have been satisfied.

Some questions ask you to add up the points that a player has earned for performing different operations such as knocking, unscrambling, etc. You will not be penalized for addition errors in summing the total number of points if you show your work. Thus you should specify the number of points that a player received for performing each operation.

You will have only ten minutes to complete these sixteen questions. Please work as rapidly and carefully as you can.

1. From his ten cards, Player A has formed two words, STEREO and TELL, in Round 2 and has knocked. Neither word contains any bonus letter cards. How many points has Player A earned for this portion of Round 2?

2. During Round 2, Player A has knocked. The two words he has formed from the eleven letter cards in his hand are NARRATE and TOLL. The two words do not contain any bonus letter cards. How many points has Player A earned for this portion of Round 2?

3. Player A has the word BUILDER and the letters CABL in his hand when he draws an E letter card from the deck to form the word CABLE. Neither word has any bonus letter cards. Player A then knocks on the table. How many points does Player A earn for this portion of Round 2?

4. During Round 3, Player A has knocked. The two words he has formed from his eleven letter cards are REGRESS and FIRE. The two words do not contain any bonus letter cards. How many points has Player A earned for this portion of Round 3?

5. Player A forms two words, TABLE and TREE, and then he knocks. The two words do not contain any bonus letter cards. How many points does Player A earn for this portion of Round 1?

6. Player A has knocked. Player B has used all of his cards to form two words, CARRIAGE and ABLE. The two words do not contain any bonus letter cards. How many points has Player B earned for this portion of the round?

7. During Round 1, player A has knocked. The three words he has formed from his twelve letter cards are BAIL, JAIL, and HAIL. One of the three words contains a single bonus letter card. How many points has Player A earned for this portion of Round 1?

8. Player A has knocked. Player B has used all of his cards to form one word, PROJECTILE. This word contains one bonus letter card. How many points has Player B earned for this portion of the round?
-
9. Player A has formed the word REGENERATIVE from his twelve letter cards and he has knocked in Round 3. This word does not contain any bonus letter cards. Player B, C, and D fail to unscramble it. How many points does Player A receive for this hand?
-
10. Player A has formed the words, FEAR and GROANS from the ten letter cards in his hand and knocked in Round 2. These words do not contain any bonus letter cards. Player B was only able to unscramble the word FEAR and Player D was only able to unscramble the word ORGANS. Player C was unable to unscramble both words. How many points does Player A receive for his hand?
-
11. Player A formed the words STALLION and BULGE from the thirteen letter cards in his hand and knocked in Round 3. The two words do not contain any bonus letter cards. After Player A unscrambled his words, Player B unscrambled the word BUGLE. How many points does Player A receive for this portion of Round 3?
-
12. Player A has knocked in Round 3. Player B has formed the words POLE and BRING from the letter cards in his hand. Player A unscrambles the words BRING and LOPE. How many points does Player B receive for his hand of Round 3?
-
13. During Round 1, Player A has knocked. Player B has formed the words WHEEL and SHOE from the letter cards in his hand. One of these two words contains a single bonus letter card. How many points has Player B earned for this portion of the round?
-

14. During Round 1, Player A has knocked. Player B has formed the word JUSTICE: this word contains one bonus letter card. Player C has formed the word ZERO: it contains a single bonus letter card. Player C unscrambles the word JUSTICE. How many total points does Player C receive for words he has formed and unscrambled?
-
15. Player A forms the words TRAINS and LIVE from the ten letter cards in his hand. He knocks. It is Round 2. Player B forms the words EARN and LEER. Both players then scramble the letter cards of their words. Player A unscrambles Player B's words as NEAR and LEER and Player B unscrambles Player A's words as STRAIN and VILE. What is the total combined score for the points earned by both Players A and B for this hand of Round 2?
-
16. Player A forms the words BITTER and TOAST from the eleven letter cards in his hand and knocks in Round 1. Player B forms the words YOURS and BOAT. Player B unscrambles the words BITTER and TOAST and Player A unscrambles the word BOAT. What is the total combined score for the points earned by both Players A and B for this hand of Round 1?
-

APPENDIX D

APPENDIX D

TUTOR EVALUATION QUESTIONNAIRE

Now that you have been tutored for ten minutes, we would like you to evaluate your tutorial session. For the experimental study which will be conducted in the fall, we are considering the possibility of using a tutor to help people learn how to play the game. Thus, in our pretesting this summer it is important for us to determine what effects the tutoring has had for different people.

MEASURING INSTRUMENT FOR TUTORIAL SESSIONS

INSTRUCTIONS

We are interested in the way people describe tutorial sessions in which they have participated. You will be presented with a series of statements used to describe tutorial sessions. Following each statement will be a seven-point scale. You are to judge the tutorial session in relation to the statement. Please make your judgments on the basis of how well you think the statement describes the tutorial session in which you have just participated.

Below is a sample statement and a scale.

The tutorial session was active.

Agree: : : : : : : :Disagree
 3 2 1 0 -1 -2 -3

If you completely agree with the statement as applied to your tutorial session you would place a check mark in space number 3. If you mostly agree (but not completely) place a check mark in space number 2. If you slightly agree check number 1. If you neither agree nor disagree check 0. If you completely disagree check -3. If you mostly disagree check -2. If you slightly disagree check -1.

The "0" or neutral space on the scale may also be used for "I don't know" or "I don't think this scale applies."

- IMPORTANT:
- 1) Place your check marks in the middle of spaces, not on the boundaries.
 - 2) Be sure to check the scale for every concept. DO NOT OMIT ANY ITEMS.
 - 3) Never put more than one check mark on a single scale.
 - 4) DO NOT look back and forth through the items, make each item a separate and independent judgment.
 - 5) Your first impression, the immediate "feelings" about the items, is what we want.

1. If I were to participate in another tutorial session of this type I would prefer to be with a different tutor.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

2. The tutor was considerate of my feelings during the ten minute tutorial session.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

3. There was a friendly atmosphere during the tutorial session.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

4. I like the person who tutored me.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

5. The tutoring made learning how to play this game interesting.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

6. If I were to participate in another project of this type I would prefer to be tutored about a different adult game.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

7. I enjoyed learning how to play this game.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

8. I would like to spend more time learning how to play this game.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

9. The tutor was uncooperative.

Agree: : : : : : : : Disagree
 3 2 1 0 -1 -2 -3

10. The tutor and I agreed with each other on most things.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

11. The tutor and I worked together to obtain a common objective.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

12. The tutor and I worked together as a team.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

13. The tutor and I accomplished as much as could have been expected in the limited time of ten minutes.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

14. I was not satisfied with the results of this tutorial session.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

15. I would be willing to try to convince my friends that a tutorial session is an effective means of teaching someone to play this game.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

16. I would be willing to have my name made public in support of the position that a tutorial session is an effective means of teaching someone to play this game.

Agree: $\frac{\quad}{3} : \frac{\quad}{2} : \frac{\quad}{1} : \frac{\quad}{0} : \frac{\quad}{-1} : \frac{\quad}{-2} : \frac{\quad}{-3}$: Disagree

APPENDIX E

APPENDIX E

GAME PROCEDURE QUESTIONNAIRE

		<u>CIRCLE</u>
1. How many cards does the dealer deal to each player? (10)	+1	0
2. How many cards should the dealer place in the discard tray? (1)	+1	0
3. What do the players do as soon as they get their ten cards from the dealer? (Begin to form words)	+1	0
4. Of the rules for forming words, there is one rule concerning the minimum number of letters in a word. Do you remember what it is? (4 letters)	+1	0
5. Do you remember any of the other rules for forming words? (Give subject credit if he remembers any two of them and then tell him what the rest of them are.)	+1	0
a) no hyphenated words, contractions, abbreviations with periods.		
b) proper names and capitalized words only if decided before start of the game.		
c) plural forms must contain at least 6 letters including the "s".		
d) no misspelled or nonexistent words/dictionary.		
6. What is the goal or purpose of forming words? (To knock)	+1	0
7. Do you remember what the requirements to knock are for a hand of Round 1? (Use all cards to form words and have at least one word of 5 letters or more.)	+1	0
8. After your opponent (the research assistant) has tried to form words to see whether he can knock, do you remember what he does next? (He draws either from the deck or the discard pile.)	+1	0
9. How many cards can he draw from the deck? (1)	+1	0

10. How many can he draw from the discard pile? +1 0
(As many as he wishes, consecutively.)
11. What is the rule about discarding? +1 0
(He must discard one card after drawing from either the deck or the discard pile.)
12. In regard to drawing and discarding, when can a player knock? +1 0
(He must draw a card before knocking, but he is not required to discard, altho he may discard if he wishes.)
13. On a piece of scratch paper please figure out how many points you have earned thus far in the round. +1 0
(Give credit if he totals his score correctly.)
- | | | | |
|---------------|----|-----------------|----|
| Bonus letter | 5 | No unused cards | 10 |
| Other letters | 2 | 4 or more words | 5 |
| "Knocking" | 15 | | |
14. What is the next phase of the game? +1 0
(Scrambling-Unscrambling)
15. How do you scramble your words in the word holder? +1 0
(Separate and distinct. Don't mix letters of 2 words together.)
16. After the letters are scrambled what should be done next? +1 0
(Turn scrambled words in word holders toward your opponents for unscrambling.)
17. Can you think of one of the rules that you must follow in unscrambling your opponents' words? +1 0
(Give credit for one and tell him others.)
- a) You may unscramble any legitimate word (doesn't have to be the one opponent had in mind.)
 - b) You must unscramble each of your opponents' words separately (can't unscramble a word with letters from two or more words; can't unscramble one word from two or more of your opponents words; each unscrambled word must contain the same number of letters as the word originally scrambled by the opponent.)
 - c) You must not violate the rules for forming words when you unscramble a word.

- | | | | |
|-----|---|----|---|
| 18. | Is your opponent allowed to handle the cards during the unscrambling?
(No. He must perform the unscrambling in his head or on a piece of scratch paper.) | +1 | 0 |
| 19. | Do you remember how much time you have to unscramble each other's words?
(3 minutes) | +1 | 0 |
| 20. | How many points does a player receive for unscrambling the letters of one of his opponent's words?
(1 point per letter of each word unscrambled) | +1 | 0 |

NOTE: THE 10 POINTS FOR FAILING TO UNSCRAMBLE ONE OF YOUR
OPPONENT'S WORDS WILL NOT APPLY FOR THIS HAND.

GRAND TOTAL

APPENDIX F

APPENDIX F

SUBJECT'S SCORE SHEET

Please itemize the total points earned by subject.

Words formed =

Bonus letters =

Other cards x 2 points =

Knocking =

Used all cards =

All cards, single word =

4 or more words =

Researcher's words unscrambled =
(1 point for each letter)

TOTAL POINTS FOR HAND OF ROUND 1

APPENDIX G

APPENDIX G

GAME EVALUATION QUESTIONNAIRE

In this final questionnaire we would like you to complete several personal items that may give us additional information about whether or not most students would enjoy playing this game next fall. When you have completed this questionnaire, the research assistant will pay you \$2.00 for evaluating this game for us. If you would like to have a copy of the pretest results mailed to you, please remember to write your name and address at the bottom of the last page.

This final questionnaire should require only 15-16 minutes for you to complete it. However, you may take as much additional time as you wish.

Once again, we would like to thank you very much for helping us in this pretest. Your cooperation has been greatly appreciated.

1. I would like to play this game often.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

2. After I read the game instructions for five minutes and took the quiz for the first time, I felt confident.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

3. I would not purchase this game.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

4. I would rather have played the game without being tutored first.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

5. I think my friends would like this game.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

6. Actually playing the game helped me more than being tutored.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

7. This game is challenging intellectually.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

8. After the tutoring session I felt confident.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

9. This is a game that would not appeal to most college students.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

10. After I read the game instructions for five minutes and took the quiz for the first time I felt as if I had really failed.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

11. I would enjoy playing this game once a week.

Slightly agree____	Neither agree	Slightly disagree____
Mostly agree____	nor disagree____	Mostly disagree____
Completely agree__		Completely disagree__

12. Please use the rest of this page (and the back of the page, if necessary) for any additional comments you wish to make about the game and/or the teaching methods.

Name_____

Address (Sept. 1970)_____

APPENDIX H

APPENDIX H

OPERATIONS OF THE SIX CONCEPTS FROM THE FOIL GAME

CONCEPT: PLAY

- Operations:
1. The game consists of three rounds with each player dealing one hand during the round.
 2. The dealer shuffles the deck and deals ten cards to each player.
 3. The dealer places the remaining cards face down in one compartment of the card tray; these cards constitute the deck.
 4. The dealer removes the top card from the deck and places it face-up in the other compartment of the card tray to start the discard pile.
 5. After the cards have been dealt, the players begin immediately to group their cards in an attempt to form a word (or words).
 6. Starting with the player to the dealer's left, each player in turn either draws one card from the deck or as many consecutive cards as he wishes from the discard pile.
 7. After drawing, a player must discard one (and only one) card unless he is knocking. If he is knocking he is not required to discard.
 8. Before knocking a player must draw at least one card from the deck or the discard pile.
 9. When a player knocks who has used all of his cards to form words and one of the words is of the required size, the word formation phase of the game immediately ends.
 10. If a player knocks before he has formed at least one word of the required size for the round, and/or before he has correctly performed the operations for forming words, the word formation phase continues until one player correctly completes the requirements and knocks.
 11. When the word-formation phase of the game is completed, the scrambling-unscrambling phase begins. To begin this latter phase the players list on a sheet of paper all of the words they have formed.

12. When the scrambled letter cards of the players' words have been placed in the word holders, the three minute timer is turned over.
13. When the three minutes has expired, the dealer announces that the unscrambling must end.
14. After the unscrambling is concluded, the players then check their lists and arrange their scrambled letters into the words they originally formed.
15. After the players have reformed their original words, they count up the total number of points they have earned during the word formation and scrambling-unscrambling phases of the game.

CONCEPT: WORD FORMATION

- Operations:
1. Each word formed by a player must contain a minimum of four letters.
 2. Plural forms of words that end in "s" may only be used if the total number of letters in the word is at least six (including the "s").
 3. Contractions, abbreviations (except for those which require no periods, such as "memo") and hyphenated words may not be used.
 4. Proper names and capitalized words may be used only if the players so decide before the start of the game.
 5. A player must correctly spell each word he forms (according to the dictionary being used by the players).
 6. A player must form an existing word (according to the dictionary being used by the players).
 7. A player may form as many words as he wishes from the letter cards in his hand.

CONCEPT: KNOCKING

- Operations:
1. A player "knocks" by rapping his knuckles on the playing surface.

2. A player is eligible to knock when he has used all of the letter cards in his hand to form one or more words and has at least one word of the required size for the round.
3. In each of the four hands of round one, a player must form at least one word containing five or more letters.
4. In each of the four hands of round two, a player must form at least one word containing six or more letters.
5. In each of the four hands of round three, a player must form at least one word containing seven or more letters.

CONCEPT: SCRAMBLING

- Operations:
1. A player scrambles his words by rearranging the letter cards.
 2. The players place their rearranged letter cards for each word in the word holder so that the rearranged letter cards for each word are separated from the rearranged letters of all other words.
 3. The players must place their rearranged letter cards in the word holder so that each letter card is visible to their opponents.
 4. A player must only place the letter cards from words he has formed in the word holder. Unused cards should not be placed in the word holder.

CONCEPT: UNSCRAMBLING

- Operations:
1. All players must form words from the scrambled letter cards of their opponents' words.
 2. The players are not allowed to touch and/or rearrange their opponents' letter cards which are positioned in the word holder. The players must visually and cognitively rearrange their opponents' words. Also the players may use a pencil and scratch paper as an aid in unscrambling their opponents' words.

3. A player may use the scrambled letter cards of his opponent's words to form any word he wishes. The player is not required to reform the same word originally formed by his opponent.
4. Each word unscrambled by a player must contain the same total number of letter cards as the word scrambled by his opponent.
5. A player must unscramble the scrambled letters of each of his opponents' words separately. Thus if an opponent has scrambled two words of four letters each, the player must not make a word that contains letter cards from both of the two words.
6. A player must follow the rules for forming words when he unscrambles an opponent's scrambled letter cards.

CONCEPT: SCORING

- Operations:
1. With the exception of bonus letter cards, a player receives two points for each letter card which he uses in forming a word.
 2. A player receives five points, instead of two points, for each bonus letter card which he uses in forming a word; bonus letter cards have the word "BONUS" printed on them.
 3. A player forming four or more words is awarded five additional points.
 4. A player using all of the cards in his hand to form a single word is awarded ten additional points.
 5. A player receives zero points for each letter card in a word he has formed if he has not observed the rules for forming words.
 6. The player who knocks receives fifteen additional points if he has used all of his cards to form words and if one of the words is of the required size for that round.
 7. The player who knocks has fifteen points deducted from his score if he has failed to use all of his cards to form words and/or if he lacks one word of the required size for that round.

8. A player loses the fifteen points he earned for knocking if he has failed to follow the operations for forming words.
9. After one player has knocked, other players who have used all of their cards to form words receive ten additional points.
10. A player receives one point for each letter in an opponent's word which he unscrambles.
11. A player receives ten points for forming a word which none of his opponents are able to unscramble.
12. A player receives zero points for each letter card in a word which he has unscrambled if he has incorrectly performed any of the operations for forming words.
13. A player receives zero points for each letter card in a word which he has unscrambled if that word does not contain the same total number of letter cards as the word scrambled by his opponent.
14. A player receives zero points for each letter card in a word which he has unscrambled if he has not unscrambled each of his opponents' words separately.

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