

THE EFFECT OF COURSE-WORK
IN CHILD DEVELOPMENT AND PSYCHOLOGY ON
UNDERSTANDING THE BEHAVIOR OF PRESCHOOL CHILDREN

by

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CHAPTER I

INTRODUCTION

BACKGROUND OF THE STUDY

The most complex problem in the realm of perception is the understanding of other persons (2). In everyday living, however, we depend to a large extent on our ability to perceive and predict the behavior, thoughts and feelings of others. The common man in his daily life makes generalizations and predictions about the persons he associates with, but, these are often vague and inaccurate. An adequate understanding of behavior, as suggested by Bender and Hastroff (2), would require an attitude of "sophistication as to the subjects' inner feelings and motives" (2, p. 560). An individual's perception and understanding of behavior, in ordinary circumstances, may be inadequate, as there is hardly a need for refining his perceptions with precise, insightful generalizations about people. Yet, every person does have unformulated ideas about the purposes and inner feelings of some of the persons he interacts with, but is probably unable to refine and formulate these ideas. It is thought that an education in some areas of the behavioral sciences will provide the interest and ability

necessary for a sharpening of the learner's perception of human behavior.

It is generally agreed that education aims at supplementing the casual experiences of everyday living by offering experiences that are planned to bring about the development of one's potentialities. People grow and develop only by having many experiences and by profiting by them. Experience, as such, is basic to all learning, and is important for understanding any event, situation or concept. Education may therefore be thought of not only in terms of developing increased knowledge and skill but also in terms of the changes it brings about in the learner, which enable him to deal effectively with the varied and unpredictable events he meets in his daily life. Learning is thus defined as a change in behavior, accompanied by a change in insight or understanding.

Education in a particular field of study is, therefore, frequently identified with the acquisition of knowledge and an increased understanding in that particular area. This point of view is apparently held by those in the behavioral sciences. The statement of the aim of psychology as a science that seems to be most acceptable to the largest number of its participants is that psychology is concerned with the understanding and predicting of human behavior (6). In all probability this objective

would also be acceptable to those in the field of child development and child guidance. It is thus assumed in the teaching of child development and psychology subjects that taking course-work in these fields of study will lead to an increased knowledge of and insight into human behavior. There is need to know, however, if this factor-course-work in the behavioral sciences- can help students perceive behavior in a more exacting way than they would in ordinary situations. There is great practical value in knowing whether the hit-or-miss perceptions made by most people can be improved by the increased knowledge of adult or child behavior that is provided in most child development and psychology courses.

The present research approach aims at testing the premise that a knowledge of behavior, as gained from child development and psychology courses, increases an individual's understanding of child behavior.

PURPOSE OF THE STUDY

The purpose of this research was to investigate the oft-made assumption that course-work taken in child development and psychology results in an increased understanding of child behavior. On the basis of this assumption, it was hypothesized that there would be a

significant positive relationship between the number of courses students take in child development and psychology and understanding of the behavior of preschool children. Further, it was hypothesized that there would be no relationship between the class level of students and their understanding of child behavior. This contention suggests that senior, junior and sophomore students with similar backgrounds in child development and psychology would show no differences in their levels of behavioral understanding. If differences did occur for class levels, these could be attributed to the varying amounts of coursework the students have taken.

A further hypothesis tested in this study was that there would be no relationship between the students' understanding of child behavior and the nature of the courses that had been taken in child development and psychology. For the purpose of this study, the nature of the courses was defined as experience in observing the interaction of preschool children versus no experience in observation, and experience in nursery school participation versus no such participation experience. In the field of child development, it is usually agreed that providing students with varied experiences in observing and participating or interacting with young children strengthens and sharpens the students' ability to evaluate the behavior

of young children. While there may be no need to question the validity of this assumption, there have been few empirical studies conducted to test it. As such, there is little research evidence justifying the assumed superiority of laboratory over non-laboratory experience in the developing of greater insight into the behavior of preschool children.

In summary, the purposes of this investigation were three:

(1) To determine whether students' understanding of the behavior of preschool children increases with the number of courses taken in child development and psychology, with the factor of maturity, or year in college, held constant.

(2) To determine whether students with different class levels will vary in their understanding of child behavior, when the background of course-work in child development and psychology is held constant.

(3) To determine whether students' understanding of the behavior of preschool children is influenced by the nature of the courses they take in child development and psychology. The nature of the courses is defined for this investigation as experience in observing the interaction of preschool children versus non-observation experience, and nursery-school participation versus non-participation experiences.

The basic hypothesis guiding this study was that, with an increase in the number of courses students take in psychology and child development, there would be a corresponding increase in their understanding of the behavior of preschool children.

REVIEW OF RELATED LITERATURE

Recent studies relating to the ability to judge others have been concerned largely with differences among judges either in terms of their accuracy in making judgments or in terms of their tendency to judge others as similar to themselves. There have been a few studies and reviews of literature relating a judge's background in psychology to his ability to understand human behavior (3, 16, 20, 21). In addition to these, there have been researches supporting the idea that the ability to understand human behavior and make accurate judgments about people can be developed through a learning program (1, 8, 14, 15, 19). Studies that seem to be indirectly related to the present research are ones measuring learning outcomes after students had taken courses of study in sociology (2), education (7), and economics (10). Some investigators point to possible relationships between the ability to understand behavior and several other factors, such as a subject's similarity to the judge, age, family background, social skill, self-insight and intelligence (5, 8, 12). The research

findings put forth in the studies cited will be presented in the discussion that follows.

Gage (9), suggests that any 'social perception' or insight into other people's behavior may be considered to have four components: (1) the perceiver, (2) the individual or group perceived, (3) the evidence or stimuli available to the person judging, or the 'input', and (4) the judgment reported by the perceiver, or the 'outtake'. He states that one kind of perceiver may be more accurate than another for a certain kind of subject. Or, one kind of 'input' may increase the accuracy of judgment more than another for one kind of 'outtake', but make for less accuracy on another judgment or 'outtake'. Thus, he seems to imply that there are differences in perceivers' abilities to judge persons, which depend on various factors other than education and knowledge of behavior. These other factors, are the perceiver himself, the persons he judges, and also the evidence or stimuli he has available for making the judgment.

Taft (21), in his review of literature in the area of social perception, arrives at similar conclusions regarding the possible influence of various factors on an individual's ability to judge and understand the behavior of other persons. He considers the ability to judge the behavior of others as a complex personality

trait. In his review of research findings, he found fairly consistently that there is a positive correlation between the ability to judge the personality characteristics of others and such factors as increase in age (with children), high intelligence and academic ability, specialization in the physical sciences, esthetic and dramatic interests, insights into one's own peer status, good emotional adjustment and integration, and good social skill. On the basis of a later research study (20), he came to similar conclusions. In this study, he tested forty male graduate students, varying in age between twenty-three and twenty-five years who specialized in the physical and biological sciences, social sciences, law, and business administration. He found that the ability to judge human behavior was strongly influenced by the social attitudes of the judges. Poor and good judges seemed to vary in social dependence or detachment. He used this difference in social attitudes to explain other differences he found relating to sibling status, academic specialization and tendency to be a generous rater.

Taft's conclusion that judging ability may be related to one or more of several factors seems to be supported by other research evidence. Diers (5) tested sixty student nurses in an attempt to study the probable relationship between a person's understanding of others,

and similarity to the person, liking for the person, and introversion. She found that a positive relationship existed between prediction accuracy and similarity to the person being judged, but found no relationship between prediction accuracy and liking for the subject. Also, there appeared to be a negative correlation between the social introversive characteristics of the judge, and his understanding of others.

Estes (8) made six experiments, having 323 judges estimate the personalities of fifteen male subjects from motion picture records of their behavior. Judgments were obtained by means of ratings, check-lists and matching. Statistically significant results were obtained in the use of all three methods, but the accuracy of the judgments was found to vary with the judge, the subject, and the aspects of personality being judged. It was also found that judges with strong interests in either the graphic arts or dramatics were more accurate than those whose main interests were in the sciences and philosophy. These results confirm Taft's (20) conclusions that a significant positive correlation appears to exist between the ability to judge other persons, and the judges' interest in esthetic and dramatic activities. However, the work of Estes appears to contradict Taft's conclusion that there is a positive correlation between specialization

in the physical sciences and behavioral understanding.

These various findings have bearing on the present research to the extent that, as Mahan says, "the individual does not make a coldly intellectual judgment." (12, p. 163). Every person appears to evaluate a situation in terms of his own values, needs and desires, and even though he uses a logical form in drawing conclusions, these are not necessarily objectively deduced. While this may make it seem that education in the behavioral sciences would have little effect on the objectivity and accuracy with which individuals judge others, most researchers agree that a pre-existing frame of reference plays an important part in a person's understanding of others. Education makes a contribution to this frame of reference, but it may not be the only contributing factor. That learning programs and practice do influence behavioral understanding, however, is seen in the research findings cited below.

Martin (13), for instance, studied judges of others in an attempt to discover whether judgments of certain complex traits and more objective characteristics could be improved by practice and correction. The judges had short interviews with each judgee, and then made evaluations of a series of five distinct traits. As soon as the judgee was dismissed, corrections were handed to those who

were scheduled to receive them. Martin concluded that an "appreciable improvement may be effected in judging more of the psychological traits... when such judgments are practiced and checked by standardized measures." (13, p. 690). This would have implications for teaching psychology and child development courses, as the conclusion suggests that experience and practice in making judgments of adults or children would probably improve an individual's understanding of behavior.

Somewhat similar to the latter research is the study of McNeill (14), which was designed to determine to what extent the concept of underlying causes of problem behavior is operative in specified groups of adolescents, and how effective a learning program would be in developing this concept. The findings of this study indicate that an understanding of the causes of behavior is not well developed even at the senior level in high school. The analysis of the results of the learning program tend to indicate that it is not easy to develop the concept because it is one that incorporates many other functions. Stiles (19) introduced a similar learning program to 172 children in the fourth, fifth and sixth grades of a school in a small town in Iowa. The program was designed to help children develop an analytical approach to the understanding of behavior problems. For this purpose, five behavior

patterns common to the experience of the children and of interest to them were introduced by three stories and discussed from various points of view. Two main understandings were stressed: (1) the same behavior may have many causes, and, (2) it is helpful to discover the causes in order to understand or change behavior. Stiles found that although the gains were not large, they were significant, and so, indicated that a learning program such as the one used in the study had made a small beginning in helping the children to develop a more analytical approach to problems of behavior which face them. The research findings of Morgan and Ojemann (15) also seem to point in the same direction. In their study a learning program designed to develop an understanding of behavior in family, social relationships and marriage was introduced to two experimental groups of subjects (with median ages 20.4 and 21.0 years). The experimental groups were matched with control groups. An analysis of the results showed that the learning experiences were effective in producing significant changes in attitudes. The investigators seem to be of the opinion that significant changes in understanding of behavior can be made at the upper levels through an effective learning program.

Indirectly related to the present study are the findings of Kornhauser (10), Cook and Koeninger (4), and Einhorn (7). Kornhauser's study (10), involved the

administering of 'before and after' tests to students of economics for each of three quarters of the academic year, and noting any changes in attitudes and levels of information. In general, he concludes that significant improvement in knowledge and attitudes was found at the end of the courses. Also, the changes in a number of items on the test used as a before-after measure were related to the particular content and points of emphasis in the course. Cook and Koeninger (4) conducted a similar study on students of sociology, in an attempt to gain pre -and post- measures of learning outcomes in three areas: information, attitudes and critical thinking. The results showed that the students acquired an increased amount of information and showed a significant change in attitude at the end of three courses in sociology. Changes in critical thinking over this period were small and the investigators concluded that the development of this ability was a more difficult process than is usually thought. Einhorn (7) studied the differences in social beliefs held by selected education and non-education majors, at the University of Michigan. He concluded that measurable and significant differences existed between the social beliefs held by education and non-education majors, and that the field of study was an important determinant of social beliefs.

The findings of Asch, Block and Hertzman (1) seem to indicate similar conclusions. These subjects were required to make certain judgments concerning a number of characteristics of photographs of political figures, professions and slogans. The investigators concluded that subjects' judgments were not only influenced by their own basic attitudes, but also suggest that when a subject had some objective knowledge (probably that provided by education and instruction) of a situation, his judgments are partly determined by it. Education in the behavioral sciences, as such, could be a factor influencing subjects' understanding of human behavior.

There is some evidence pertaining to the relative abilities of persons with training in psychology and others not trained in psychology to understand human behavior. Rabin (16) studied an individual's ability to judge personality, as measured by the Szondi pictures. The six sets of forty-eight pictures (of psychiatric diagnoses), were shown to a group of eighty-five undergraduates with several courses in psychology, and to a group of thirty-seven psychologists. Each subject was supplied with a check-list of eight diagnoses and was required to match the pictures on the screen with the correct diagnoses. Rabin's findings indicate that the number of portraits in which the diagnoses were correctly

identified by psychologists was greater than those identified accurately by the students. As the psychologists were consistently superior in identifying the portraits, Rabin concludes that training and experience do make a difference in ability to judge personality.

Similar conclusions were put forth by Cline (3), who studied the judgments made by five groups of judges to four filmed interview situations. The subjects were 109 undergraduate college students, 147 adult members of a Protestant church congregation, 43 nursing trainees, 11 advanced engineering trainees, and 106 professional people working with behavior-clinical psychologists, psychiatrists and graduate clinical trainees. The judges made predictions about the real-life verbal and social behavior of the interviewees seen in the film. Cline found that increased length of professional psychological experience was related to greater accuracy in predicting verbal behavior, and decreased accuracy in predicting real-life social behavior of the individuals. He further found that the fairly new and less experienced clinicians predicted real-life social behavior more accurately than did the more experienced clinicians. This indicates that there is danger with increasing experience, in becoming more aware of verbal behavior but less in contact with

reality at the level of social behavior. However, his findings point to the fact that, as a group, judges with psychological training and experience were more accurate and proficient in their judgments of behavior.

In contrast to these results, there seems to be much research evidence which shows that training in psychology does not increase ability to judge and understand human behavior. Taft (21), in his review of research literature, points to findings which indicate that physical scientists and other non-psychologists appear to be more capable of judging others than either psychology students or clinical psychologists. He states that there also seems to be evidence which "suggests that courses in psychology do not improve ability to judge others and there is considerable doubt whether professional psychologists show better ability to judge than do graduate students in psychology." (21, p. 12). He points out that those taking psychology are probably too concerned about social relationships to be good judges, or perhaps, they have had little experience in dealing with different types of persons. Later, in his research investigation (20), he compared physical science students and social science students in their ability to judge others. He found that the students in the physical and biological sciences possessed an attitude which is characteristic of the good judge of personality- one of

dealing with people as objects of study in an objective fashion. The poor judges of people may have entered the social sciences because they were interested in people per se. The poorer judges in his study, were also more dependent on people for emotional satisfactions, and therefore, also tended to judge more autistically. Similar findings were reported by Luft (11). He conducted two experiments to measure the understanding clinicians have of case material, with understanding being measured in terms of accuracy of prediction. In the second experiment, the judges read interview reports and made predictions of the patients' responses to an objective test. The judges included twenty psychiatrists, twenty-eight clinical psychologists, eighteen social workers, and twenty-eight physical scientists. The results of the investigation suggest that there was no direct relationship between clinical training and the ability to predict the verbal behavior of the patient. There were no differences between the predictive abilities of clinically trained and clinically naive judges in regard to verbal behavior. He does not imply, however, that both groups could apply their understanding for therapeutic purposes. He suggests that clinically trained persons probably have better ability to choose proper remedial techniques. There seems, therefore, to be research evidence indicating both the

influence and the lack of influence of psychological training on the ability to judge human behavior.

The only study found which related directly to changes in attitude fostered by learning programs in family relations and child development was the study by Walters and Fisher (22). They report on changes in the attitudes of young women who were majors in a Department of Family Relations and Child Development, toward child guidance, over a two year period. During this time they took undergraduate courses in child development. These investigators report that attitudes toward children continued to change throughout the subjects' undergraduate years, when instruction in child development and guidance was provided. They further state that these changes are not a function of maturation, and so, could probably be attributed to a function of instruction. Measures of attitudes were obtained by means of the Child Guidance Survey, and the University of Southern California Parent Attitude Survey. There was evidence to suggest that the subjects' attitudes pertaining to such factors as freedom allowed a child in the choice of activities, improved considerably after taking the courses in child development and guidance. The attitude changes that were found were in the desirable direction- that of greater permissiveness and acceptance in guidance with reference to areas of problem

behavior. Taking courses in child development did seem to result in better understanding and acceptance of child behavior, among these undergraduate students.

From all the research findings cited it appears to be likely that "the factor of knowledge produces a more stable attitude and one more resistant to change." (1, p. 251). But as these investigators point out, knowledge and instruction may only partly determine the accuracy of judgment in any situation, including the understanding of a behavioral episode. Thus, it may be well to proceed cautiously in attempting to relate understanding of human behavior to any one influencing factor.

CHAPTER II

PROCEDURE

DESIGN OF THE EXPERIMENT

Essentially, the methodology used in this study involved the use of a film test, the FUB, for evaluating the behavioral understanding of various groups of subjects. The details of the procedure are outlined below.

Subjects

The subjects used in this study were 130 college undergraduate students at the Oregon State College, with varying levels of course-work in child development and psychology. The criteria for the selection of the subjects were as follows:

1. Female
2. Undergraduate
3. Year in school
4. Specific levels of course-work in child development and psychology.

No attempt was made to control for such variables as family background or marital status of the subjects, and other areas of academic course-work.

The subjects were divided into five experimental and three control groups, as shown in Figure 1. The five

experimental groups were equated on the basis of the students' year in college, all of them being seniors, and were grouped according to their differing backgrounds of academic course-work in child development and psychology. Control for variance due to differing levels in college was achieved through the use of control groups made up of sophomore and junior students having backgrounds of academic course-work in child development and psychology similar to their matching experimental groups.

Experimental groups. It can be seen from Figure 1 that all of the experimental groups contained senior students, each group having varying amounts of course-work. Equating the experimental groups in this manner was a means of controlling for possible maturational effects on students' understanding of behavior. Experimental group 1 consisted of six senior students, each having taken two to three courses in psychology, but with no other courses relating to child development or the understanding of behavior. The exact nature of the two courses in psychology was not specified, and five out of the six subjects in the group had taken only two beginning courses in general psychology. The one other subject had in addition to two general psychology courses a course in the study of the abnormal personality.

EXPERIMENTAL GROUPS				
1	2	3	4	5
6 Sr. students with 2 to 3 courses in psychology. No courses in child development.	20 Sr. students with 2 to 3 courses in psychology, plus 2 courses in child development. Experience in observing child behavior.	20 Sr. students with 2 to 3 courses in psychology, plus 2 courses in child development. No experience in observing child behavior.	20 Sr. students with 2 to 3 courses in psychology, and at least 3 courses in child development. Laboratory experience in observation and participation.	9 Sr. students with 2 to 3 terms of psychology and at least 3 courses in child development. No laboratory experience in observation and participation.
CONTROL GROUPS				
1	2	3		
20 Soph. students with 2 to 3 courses in psychology. No courses in child development.	15 Jr. students with 2 to 3 courses in psychology, plus 2 courses in child development. Experience in observing child behavior.	20 Jr. students with 2 to 3 courses in psychology, plus 2 terms of child development. No experience in observing child behavior.		

FIGURE 1. A Description of the Experimental and Control Groups.

Experimental group 2 consisted of twenty senior girls with two to three courses in psychology, plus two courses in child development, but no other courses related directly to child development or the understanding of behavior. These subjects also had observation experience in a nursery school situation. All of these twenty students had taken a two-course sequence in child development.

The subjects in experimental group 3 were twenty senior students with the same number of courses in psychology and child development as the subjects in experimental group 2, but not having had experience in directed observation. A majority of the students in this group had taken general psychology courses and a few of the students had also a third course in personality and development. All the subjects in this group had taken a course in Human Development and a course in Educational Psychology.

Experimental group 4 consisted of twenty students with at least two to three terms of psychology and at least two terms of child development. Also, these subjects had experiences in the nursery school laboratory, not only in observing and recording child behavior, but also in participating in the daily nursery school program. All the students in the group had taken a course directly related to the understanding of the nursery school child

which required them to participate in the nursery school for one day a week during one term.

Experimental group 5 consisted of nine senior girls who had the same background of course-work in psychology as the seniors in the experimental group 4, except that the students in this group did not have laboratory experience in observing and participating in a directed program with children.

Control groups. The three control groups were set up so as to match experimental groups 1, 2 and 3 in amount and level of course-work but to vary in year in college. Control group 1 consisted of twenty sophomore students matched against the subjects in experimental group 1 for academic course-work in child development and psychology. Control group 2 was made up of fifteen junior students who were matched with experimental group 2 in the number of courses taken in child development and psychology, and, control group 3 was made up of twenty junior students who had identical backgrounds of academic course-work as experimental group 3.

As a result of this design, differences observed in behavioral understanding could be attributed to differences in number of courses the subjects had taken in child development and psychology. Further, the possible effect

of observation experiences on the students' understanding of behavior would be measured by a comparison of experimental groups 2 and 3. If these groups showed differences in their levels of understanding, these could be attributed to the nature of the courses they had taken, that is, their observation versus non-observation experiences. A comparison of the experimental groups 4 and 5 would further reveal any differences in understanding behavior which could be related to the differences in the laboratory versus non-laboratory experiences of these otherwise identically matched groups of subjects.

A comparison of control group 1 with experimental group 1, control group 2 with experimental group 2, and control group 3 with experimental group 3, would bring to light any effects of maturation, or differences related to the students' varying class-levels. A comparison of all three control groups would also be a measure of the level of behavioral understanding as it is related to differences in the class levels of students. A comparison of control groups 2 and 3 would reveal possible differences in behavioral understanding caused by the nature of the courses taken by the subjects- observation versus non-observation experiences.

Measurement of behavioral understanding

The measure of behavioral understanding used in the study was obtained by means of the Film Test for Understanding Behavior (FUB).

Description of the test. The test consists of ten filmed episodes of the behavior of preschool children aged three to four years. Each episode runs approximately one minute in length. The episodes focus on behavior in an eating situation, in an organized group play activity, children being messy with paints, aggressive behavior, working at picture puzzles, and so on. The behavioral episodes thus emphasize types of behavior that are commonly observable in children of this age, and such interactions as would be of interest to parents and students of behavior. Six items have been developed around each episode, and each item aims at measuring a student's general knowledge of child behavior, sensitivity to the behavior portrayed, or the application of guidance techniques. Responses to each item are made in terms of a five point agreement-disagreement scale. A copy of the test booklet, answer-sheet and directions for scoring appear as Appendix A.

The purpose of the test. The FUB was designed to

gain an objective measure of

(1) a student's knowledge of developmental and behavioral norms pertaining to preschool children, aged three to four years,

(2) a subject's awareness of a child's behavior in terms of its long-range implications for his future development, in terms of its reflecting the child's existing personality traits- his needs, frustrations, interactions with others, and so on,

(3) a subject's sensitivity to the feelings of children, and

(4) a subject's ability to apply guidance principles to specific behaviors.

Philosophy underlying the test. Any motion-picture test, particularly in the behavioral sciences, has advantages for group testing that are not possessed by pencil-and-paper tests (12). The motion-picture test presents a stimulus situation that is, to a large extent, equivalent for all who take the test. Further, the stimulus situation is usually a good representation of the actual situation, with fewer chances of the original incident being misconstrued or inadequately covered by an inability to describe it in words. As long as the phenomena being described in the test are relatively simple, obvious and clear-cut, or have readily agreed upon meanings, they become more

difficult to describe in words alone, and accordingly, the stimulus situation loses its objectivity, and is likely to be misinterpreted to the testee. This is due to the abstract nature of words, the manifold meanings that can be attached to any one word symbol, and the increasingly idiosyncratic perception the tester has of the phenomena he is describing. These problems are increased in tests dealing with human behavior, for here the defences and biases of both examiner and testee are active in distorting perception. To provide objectively equivalent stimulus-situations in tests related to complex phenomena, especially action phenomena structured in time and space, some means other than words are necessary. Motion-picture tests seem the solution to the problem.

A motion-picture test cannot be used alone, however, as it is necessary to focus the subject's attention on particular aspects of the stimulus situation which are of interest to the examiner. This has to be done through the use of word symbols. Therefore, film tests will need to combine films or analogic codification and word symbols or digital codification as a means of collecting meaningful responses to a stimulus-situation. A representation of the fine nuances of interaction that take place during an episode of behavior could therefore be better conveyed to a testee through a motion picture than a written test. On

the basis of this reasoning, and on the basis of the results of exploratory work with the FUB, it seemed to offer an adequate means of measuring behavioral understanding.

The development of the FUB. All of the episodes of behavior in the FUB were filmed at the Oregon State College nursery schools. Ten to fifteen statements were then drawn up around each of the episodes to test various aspects of behavioral understanding. Pretesting of these statements was carried out in two phases. The items were first presented to a group of professional persons and students in the field of child development for an evaluation of their clarity. On the basis of this evaluation, the items were revised and submitted to a group of nursery school teachers who served as experts, with the aim of arriving at a set of good items and 'most correct' answers to these items. This constituted the second step of pretesting. Each expert was required to respond to each item in terms of a five point agreement-disagreement scale, indicating a most correct and a next-most correct response for each item. Further, they identified the items which were felt to be either particularly strong or particularly weak. The experts also suggested items to cover important aspects of the behavior not already covered by the existing items.

On the basis of the experts' evaluations, six items which were rated as being strong by four out of five judges, and which had at least eighty-five percent inter-judge agreement as to the 'most correct' response, were selected for each episode. Also, on the strength of these evaluations, a ranking was made of the five possible responses to each item, from most correct to least correct. Thus, a scoring weight, ranging from +2 to -2 was attached for each item response.

In addition to this, a traditional item-analysis was run on the scores of two groups of students tested, and the items which discriminated the high and the low scoring students in both groups were noted. There were twenty-eight such items. A total test score for each subject was then computed on the basis of the twenty-eight highly discriminating items. The subjects in each of the two groups were then ranked on the basis of their initial total scores and revised total scores, and a rank-order correlation was computed. The rank-order correlations obtained were +0.77 and +0.90. On the basis of these results, the decision was made to use full-scale scores for this study.

Adequacy of the FUB as a measuring instrument. Since the FUB is comparatively a recently developed test, there is as yet little or no standardization data pertaining to

it. A test-retest reliability coefficient was computed on the basis of the scores for seven students, with a time lapse between testing of an average of two months. One subject, however, was tested within seven days of the primary testing, and another within five months and sixteen days of the first testing. These subjects had taken no course-work in either psychology or child development in the intervening period, and hence, any differences in retest scores could probably be attributed to being a function of the effects of practice or to testing conditions. The reliability coefficient for the test-retest measure was +0.78.

Validity has not yet been demonstrated for the FUB. However, if the test shows significant differences, or discriminates between the various experimental and control groups in the present study, it could be taken as a measure of its validity. Further, the test does have high face or content validity.

Scoring the FUB. As there is a total of sixty items on the FUB, the scores on the test can range between +120 and -120. A larger plus score would indicate that a subject has checked more 'correct' than 'less correct' on the test.

The items on the FUB were drawn up so as to fall into

three general classes, and as such, are grouped into three sub-scales. One group of items aims at testing a subject's knowledge of guidance principles. Eighteen items make up the Guidance Sub-Scale. Another group of items aims at testing a subject's sensitivity to the behavior he views in the film. Fifteen items make up the Sensitivity Sub-Scale. There is also a group of items focusing on the subject's general knowledge of child behavior and development. This group of items is labelled the Knowledge Sub-Scale, and consists of twenty-seven items. The three sub-scales were devised in an attempt to measure what seem to be three major areas related to behavioral understanding. ✓

Method of Procedure

The FUB was administered to subjects fitting the criteria for each of the experimental and control groups. The information about the test, given to the students before testing is presented in Appendix B.

RESULTS

The problems investigated in this study were (1) to determine whether students' understanding of the behavior of preschool children increases with the number of courses taken in child development and psychology, with the factor of maturity, or year in college, held constant, (2) to determine whether students of differing levels of maturity, as this is measured by class level, will vary in their understanding of child behavior, with the background of course-work in child development and psychology held constant, and (3) to determine whether students' understanding of the behavior of preschool children is influenced by the nature of the courses they take in child development and psychology. The nature of the courses was defined, for this study, as experience in observing the interaction of preschool children versus non-observation experience, and nursery school participation versus non-participation experiences.

Two separate analyses were made of the data collected. The first involved a comparison of the five experimental groups on the basis of the subjects' scores on the three sub-scales of the FUB to see if there was a relationship between the number of courses taken and behavioral understanding. The three control groups were also compared

with each other for differences on the sub-scale scores. When significant differences were found within these larger groupings, tests of significance were run on the individual groups making up these larger groupings in order to determine exactly where the differences lay. The second analysis involved a comparison of the experimental and control groups, to see if there was any relationship between students' class level and their understanding of behavior. An analysis of variance, single classification, was the statistic used in all these analyses.

The detailed analyses of variance tables appear in Appendix C. Only the group means and F-values coming from the variance analyses will be presented here.

Table 1 contains the results of the analysis of variance by sub-scales for the over-all experimental and control groups.

TABLE 1
F-VALUES FOR EXPERIMENTAL AND CONTROL GROUPS ON THE THREE
SUB-SCALES OF THE FUB

Sub Scales \ Groups	Experimental Groups	Control Groups
I Guidance	F _{4,71} = 9.5897**	F _{2,52} = 10.1658**
II Sensitivity	F _{4,71} = 4.469**	F _{2,52} = 10.8703**
III Knowledge	F _{4,71} = 4.9426**	F _{2,52} = 6.4182**

** F value significant at the 0.01 level

It will be seen from these data that the F-values were significant at or beyond the 0.01 levels for all subscales for both the experimental and control groupings. On the basis of these data, an analysis of the individual groups within these two larger groupings was undertaken to determine where the differences lay. The results of this analysis for experimental groups appear in Tables 2 through 4.

The data appearing in Table 2 indicate that seniors with only two courses in psychology had significantly less knowledge of guidance principles than seniors having varying amounts of course-work in child development and psychology. It will be seen also from these data, that the seniors with two courses in child development, with observation experiences, had significantly higher scores than students with similar course-work but no observation experience. Similar results were found when the students with two terms of psychology and two terms of child development were compared with those who had three or more courses in child development with observation and participation. A smaller but still significant difference was found when these students were compared to students having three or more courses in child development, but no observation and participation experience. No differences were found between students who had taken

TABLE 2

MEANS AND F-VALUES FOR EXPERIMENTAL GROUPS ON THE GUIDANCE SUB-SCALE

Exp. Group \ Experimental Group	1 Psy.-2terms C.D.-none Mean- 1.5	2 Psy.-2terms C.D.-2terms + obs. Mean=16.5	3 Psy.-2terms C.D.-2terms no obs. Mean= 7.7	4 Psy.-2terms C.D.-3terms + parti. Mean=17.75	5 Psy.-2terms C.D.-2terms no parti. Mean=14.67
1	-	F _{1,24} =15.8071**	F _{1,24} =8.1460**	F _{1,24} =21.5175**	F _{1,13} =8.4569**
2	-	-	F _{1,38} =19.9838**	F _{1,38} =0.7027	F _{1,27} =0.3738
3	-	-	-	F _{1,38} =26.2003**	F _{1,27} =7.6208*
4	-	-	-	-	F _{1,27} =1.4567

* F value significant at the 0.05 level

** F value significant at the 0.01 level

three or more courses in child development without observation and those who had taken three or more courses in child development with observation and participation.

On examining Table 3 it can be seen that significant differences in sensitivity were found to exist only between students who had two courses in psychology and two terms of child development without observation experience and the students who had two terms of psychology and three or more terms of child development. The direction of this difference favored the students with the larger number of courses in child development. This relationship held irrespective of whether those who had had three or more terms of child development had observed and participated, although the F-value for those who had observed and participated far exceeded that for those who did not observe or participate.

The data in Table 4 indicate that by and large, varying amounts of course-work in child development and psychology, with or without observation and participation, have little to do with general understanding of the development and behavior of children. Only when compared to students having two terms of work in psychology were significant differences found, and these occurred only when observation and participation had been a part of the child development course-work.

TABLE 3

MEANS AND F-VALUES FOR EXPERIMENTAL GROUPS ON THE SENSITIVITY SUB-SCALE

Exp. Group	1 Psy.-2terms C.D.-none Mean=7.17	2 Psy.-2terms C.D.-2terms + obs. Mean=9.35	3 Psy.-2terms C.D.-2terms no obs. Mean= 5.7	4 Psy.-2terms C.D.-3terms + parti. Mean=10.9	5 Psy.-2terms C.D.-3terms no parti. Mean=10.0
1	-	$F_{1,24}$ =0.7065	$F_{1,24}$ =0.4422	$F_{1,24}$ =3.6886	$F_{1,13}$ =1.3975
2	-	-	$F_{1,38}$ =4.9307	$F_{1,38}$ =1.0367	$F_{1,27}$ =0.9682
3	-	-	-	$F_{1,38}$ =15.2941**	$F_{1,27}$ =5.8229*
4	-	-	-	-	$F_{1,27}$ =0.3380

* F value significant at the 0.05 level

** F value significant at the 0.01 level

TABLE 4

MEANS AND F-VALUES FOR EXPERIMENTAL GROUPS ON THE KNOWLEDGE SUB-SCALE

Exp. Group	1 Psy.-2terms C.D.-none Mean=16.5	2 Psy.-2terms C.D.-2terms + obs. Mean=25.0	3 Psy.-2terms C.D.-2terms no obs. Mean=23.4	4 Psy.-2terms C.D.-3terms + parti. Mean=26.65	5 Psy.-2terms C.D.-3terms no parti. Mean=24.33
1	-	$F_{1,24}$ =4.3744*	$F_{1,24}$ =4.0617	$F_{1,24}$ =7.352*	$F_{1,13}$ =2.5836
2	-	-	$F_{1,38}$ =0.5239	$F_{1,38}$ =0.2039	$F_{1,27}$ =0.4462
3	-	-	-	$F_{1,38}$ =4.0859	$F_{1,27}$ =0.1283
4	-	-	-	-	$F_{1,27}$ =0.6458

* F value significant at the 0.05 level

The results of the breakdown analysis of the control groups appear in Tables 5 through 7. These results also are ordered by sub-scales.

On examining the data summarized in Table 5, it can be seen that sophomores with two courses in psychology differed significantly from juniors with course-work in psychology and child development, the direction of the difference favoring those who had had course work in child development. As was the case with the experimental groups, the group having had observation experience scored most favorably on this dimension of the test.

Essentially the same results are observed in Tables 6 and 7. With reference to the Sensitivity Sub-Scale, the only difference is that those who had had observation experience scored significantly higher on the test than did those who had had a similar number of courses in child development, but had not had the observation experience. For the Knowledge Sub-Scale, course-work in child development without observation failed to raise the score enough to bring about a significant difference over students who had never had any child development. These results conflict to some extent with the results of the breakdown analysis of the experimental groupings.

In order to test for the influence of maturity or class level on behavioral understanding, the control

TABLE 5
MEANS AND F-VALUES FOR CONTROL GROUPS ON THE GUIDANCE
SUB-SCALE

Control Group	1 Sophomores Psy.-2terms C.D.-none Mean = 4.7	2 Juniors Psy.-2terms C.D.-2terms + obs. Mean=15.47	3 Juniors Psy.-2terms C.D.-2terms no obs. Mean = 11.5
1	-	F 1.33 = 21.3221**	F 1.38 = 7.8613**
2	-	-	F 1.33 = 2.7463

** F value significant at the 0.01 level

TABLE 6
MEANS AND F-VALUES FOR CONTROL GROUPS ON THE SENSITIVITY
SUB-SCALE

Control Group	1 Sophomores Psy.-2terms C.D.-none Mean = 4.5	2 Juniors Psy.-2terms C.D.-2terms + obs. Mean=12.13	3 Juniors Psy.-2terms C.D.-2terms no obs. Mean = 8.5
1	-	F 1.34 = 17.7485**	F 1.39 = 7.1158*
2	-	-	F 1.33 = 5.8450*

* F value significant at the 0.05 level

** F value significant at the 0.01 level

TABLE 7
MEANS AND F-VALUES FOR CONTROL GROUPS ON THE KNOWLEDGE
SUB-SCALE

Control Group	Control Group	1 Sophomores Psy.-2terms C.D.-none Mean=14.85	2 Juniors Psy.-2terms C.D.-2terms + obs. Mean = 23.87	3 Juniors Psy.-2terms C.D.-2terms no obs. Mean = 16.25
1	-	-	F 1,33 = 10.8461**	F 1,38 = 3.6156
2	-	-	-	F 1,33 = 7.5081**

** F value significant at the 0.01 level

and experimental groups were compared by sub-scales. The results of this analysis appear in Tables 8 through 10. By and large, these data indicate that maturity, as measured by class level, has no influence on behavioral understanding. This is clearly the case with respect to knowledge of guidance principles. There seems to be some advantage, however, for juniors who have two terms of psychology and two terms of child development without observation or participation on the sub-scales of Sensitivity and General Knowledge.

TABLE 8
 F-VALUES FOR THE COMPARISON OF EXPERIMENTAL AND CONTROL
 GROUPS ON THE GUIDANCE SUB-SCALE

Experi- Group Control Group	1 Seniors Psy.-2terms C.D.-none Mean = 1.5	2 Seniors Psy.-2terms C.D.-2terms + obs. Mean = 16.5	3 Seniors Psy.-2terms C.D.-2terms no obs. Mean = 7.7
1 Sophomores Psy.-2terms C.D.-none Mean=4.7	F 1,24 =0.6713	-	-
2 Juniors Psy.-2terms C.D.-2terms + obs. Mean = 15.47	-	F 1,33 =0.1203	-
3 Juniors Psy.-2terms C.D.-2terms no obs. Mean = 11.5	-	-	F 1,38 = 2.9213

TABLE 9

F-VALUES FOR THE COMPARISON OF EXPERIMENTAL AND CONTROL GROUPS ON THE SENSITIVITY SUB-SCALE

Experi. Group	1 Seniors Psy.-2terms C.D.-none Mean = 7.17	2 Seniors Psy.-2terms C.D.-2terms + obs. Mean = 9.35	3 Seniors Psy.-2terms C.D.-2terms no obs. Mean = 5.7
Control Group			
1 Sophomores Psy.-2terms C.D.-none Mean = 4.5	F 1,24 =1.1174	-	-
2 Juniors Psy.-2terms C.D.-2terms + obs. Mean = 12.13	-	F 1,33 =2.2916	-
3 Juniors Psy.-2terms C.D.-2terms no obs. Mean = 8.5	-	-	F 1,38 =4.3604*

* F value significant at the 0.05 level

TABLE 10

F-VALUES FOR THE COMPARISON OF EXPERIMENTAL AND CONTROL GROUPS ON THE KNOWLEDGE SUB-SCALE

Experi. Group	1 Seniors Psy.-2terms C.D.-none Mean = 16.5	2 Seniors Psy.-2terms C.D.-2terms + obs. Mean = 25.0	3 Seniors Psy.-2terms C.D.-2terms no obs. Mean = 23.4
1 Sophomores Psy.-2terms C.D.-none Mean = 14.85	F 1,24 = 0.1902	-	-
2 Juniors Psy.-2terms C.D.-2terms + parti. Mean = 23.87	-	F 1,33 = 0.1735	-
3 Juniors Psy.-2terms C.D.-2terms no obs. Mean = 16.25	-	-	F 1,38 = 9.9692**

** F value significant at the 0.01 level

CHAPTER IV

DISCUSSION

The discussion of the results presented in the previous chapter will follow three main lines: (1) the effect of maturity or class-level on behavioral understanding, (2) the effect of the amount of course-work taken in child development and psychology on the understanding of child behavior, and (3) the effect of observation and participation experiences on students' understanding of preschool behavior.

EFFECT OF MATURITY ON UNDERSTANDING

On comparing the experimental and control groups, it was apparent that maturity, as measured by class level, had little or no effect on understanding of behavior. This was clearly the case with respect to the Guidance Sub-Scale, where no significant differences were found between sophomore, junior and senior groups having the same backgrounds of course-work in child development and psychology. For the students having two terms of psychology and two terms of child development without observation and participation there seemed to be some advantage for juniors over seniors on the Sensitivity Sub-Scale but for seniors over juniors on

the Knowledge Sub-Scale. By and large, however, the data indicate that maturity, as measured by class level, has no influence on behavioral understanding.

EFFECT OF NUMBER OF COURSES ON UNDERSTANDING

The results of the study seem to indicate a relationship between behavioral understanding and the number of courses taken in child development and psychology. By and large, as the number of courses increases, the students' understanding of behavior increases. This relationship is particularly clear-cut with respect to knowledge of guidance. The relationship is less clear-cut with respect to knowledge of development and behavior in general, and still less clear-cut with respect to sensitivity to behavior.

A comparison of the experimental groups on the Guidance Sub-Scale showed that seniors having only two courses in psychology and no other courses in psychology or child development had less understanding of guidance principles than seniors with similar training in psychology but with two to three terms of child development. This was the case irrespective of whether the students had had observation and participation experiences. The same result was observed in the control groups.

On the Sensitivity Sub-Scale, this trend was not

observed so clearly. A significant difference in behavioral understanding was found only between the seniors who had had two and three courses in child development, with no observation and participation experience. At the sophomore and junior levels, sensitivity to behavior appeared to increase in a step-wise manner with an increase in the amount of course-work taken in child development.

In regard to general knowledge of child behavior and development, the only difference observed was that for seniors having had just the two courses in psychology. This group had less understanding than any of the other groups. With this one exception there was no indication of an increase in knowledge with an increase in the number of courses taken in child development and psychology. This trend also held for control groups.

From these data it may be concluded that an increase in the amount of course-work in child development and psychology is closely related to an increase in knowledge of guidance principles, but that it is not so closely related to an increase in sensitivity to behavior and little if at all related to general knowledge of child behavior. These results with respect to sensitivity and knowledge of guidance principles were as expected, but the results with respect to general knowledge of behavior and development are difficult to explain. Clearly one of

the major purposes of courses in child development is the fostering of better guidance principles and one would thereby expect an increase in such knowledge with an increase in course-work. Whether this increase in knowledge is reflected in the actual guidance of children is another question. Also, one would not expect a marked increase in sensitivity to behavior with an increase in course-work, as it is likely that sensitivity to behavior is a complex personality trait, as suggested by Taft (21), and more closely related to such factors as social skill, self-insight, emotional adjustment and intellectual ability. It is also possible, however, that differences in sensitivity to behavior were not apparent between groups because the FUB was not adequate as a measuring instrument to evaluate this rather complex quality.

This latter interpretation in regard to the findings relating to sensitivity may also account for the similarity between the groups in general knowledge of behavior and development. It may be that the items making up this particular scale were so general that the groups who had had any child development had been exposed to this information. The lack of differentiation between groups may also mean, however, that there is a wider understanding of behavior and development in the general population than is expected.

EFFECT OF OBSERVATION AND PARTICIPATION ON UNDERSTANDING

It is clear from the data that the nature of the courses taken in child development influence understanding. However, this influence appeared in a way which was unexpected. The most obvious influence lay with experience in observation rather than in participation. Observational experiences tended to result in increased understanding of behavior, while this trend was not at all clear for participation experience. In the experimental groups, the senior students who had two courses in child development with observation experience had significantly better knowledge of guidance principles and were more sensitive to behavior than seniors with similar backgrounds of course-work, but lacking the observation experience. This was not the case for the General Knowledge Sub-Scale. The results from the control group analysis support the finding of greater sensitivity in students who have had observation experience but fail to support differences in knowledge of guidance principles. Also in contrast to the results of the experimental data, the control group with observation experience scored significantly higher in the General Knowledge Sub-Scale than did those without observation experience.

The data on the effect of participation on understanding are clear-cut. In no instance did the seniors with observation and participation experiences score significantly higher than seniors who had had only observation experiences. Similarly, in no instance did these students score significantly higher than students having similar background in course-work without observation or participation experience. It is noteworthy, however, that there were trends in the data favoring participation experience.

From these results it may be concluded that for the groups in this study, observation experiences in conjunction with course-work in child development tend to increase understanding of the behavior of preschool children. This is in line with the thinking that the opportunity to make systematic observations and have practice in interpreting the behavior observed helps students develop greater insight into behavior.

The oft-made assumption that participation experiences strengthen and sharpen students' ability to evaluate preschool behavior is not supported by the results of this study. The students with participation experiences appeared to show no greater understanding of child behavior as measured by the FUB than students with observation experiences alone, or than students with the same

background of child development but lacking participation or observation experience. It is possible, of course, that the FUB does not measure the kind of learning outcome that students derive from participation experience. It may also be true, however, that the participation experience itself does not result in new knowledge or better understanding of behavior, but serves mainly as an integrating experience.

LIMITATIONS OF THE STUDY

The limitations of this study lie in three general directions: (1) the small number of subjects appearing in some of the experimental groups, (2) the possible incompatibility of subject-matter background in child development between students who had taken child development with observation and participation, and those who had not, and (3) the fact that the adequacy of the FUB as an instrument for measuring behavioral understanding has not yet been sufficiently demonstrated.

The number of subjects in the experimental groups varied considerably. Only six subjects made up experimental group 1, while nine made up experimental group 5. It is likely that data based on such a few cases will be biased.

A second source of error lies in the possibility that

there was an incompatibility of subject matter background in child development between students who had taken child development with observation and participation and those who had not. It will be recalled that the students with observation and participation were Home Economics students who had their course-work focused directly on the pre-school child, while the students without observation and participation experience had taken courses in human development and educational psychology geared in large part to the school age child. It is likely that this difference in focus in course-work was reflected in behavioral understanding.

Another shortcoming of the data lies in the fact that there is not much evidence for the reliability and validity of the FUB, as the test is a relatively new one, and has not yet been standardized. The computed test-retest reliability coefficient for the FUB quoted in Chapter II is based on only seven cases. Further reliability data based on a larger number of subjects needs to be made available for the test.

Some validity has been demonstrated for the test in view of the fact that it served to differentiate the various experimental and control groupings used in this study. This is only the beginning, however. A study by Smith (18) also has relevance for the validity of the FUB. She

was interested in identifying external criteria such as grade-point average, laboratory ratings of the students, and class grades, which would be expected to correlate with the FUB. No correlation was found between these criteria and FUB scores. Also, some predicted relationships between personality variables and behavioral understanding were not supported. On the other hand, some of her predicted relationships did appear. Clearly, further measures of criterion validity for the FUB are needed.

CHAPTER V

SUMMARY AND CONCLUSIONS

SUMMARY

The aim of this study was to test the hypothesis that number of courses taken in psychology and child development is positively related to understanding behavior in preschool children.

The subjects for the study were 130 college undergraduate students with varying levels of course-work in child development and psychology. The subjects were divided into five experimental and three control groups. The five experimental groups were equated on the basis of the students' year in college, all of the subjects being seniors, and were grouped according to their differing backgrounds of course-work in child development and psychology. Control for variance due to maturity or differing levels in college was achieved through the use of control groups made up of sophomore and junior students having backgrounds of academic course-work in child development and psychology similar to their matching experimental groups. As a result of this design, differences observed in behavioral understanding could be attributed to any of three influencing factors: (1)

differences in number of courses the subjects had taken in child development and psychology, (2) differences in class level of the subjects, and (3) differences in the nature of the course-work taken in child development and psychology, that is, observation versus non-observation, and participation versus non-participation experiences of the subjects.

The measure of behavioral understanding used was the Film Test for Understanding Behavior (FUB). By means of the three sub-scales of the FUB, it was possible to evaluate each subject's level of behavioral understanding in the three main areas: (1) knowledge of guidance principles, (2) sensitivity to behavior, and (3) general knowledge of the behavior of preschool children.

CONCLUSIONS

From the results of the present investigation, the following conclusions may be drawn:

- (1) The maturity or class level of the subjects had little or no influence on behavioral understanding.
- (2) There is a positive relationship between increase in knowledge of guidance principles and an increase in the number of courses taken in child development and psychology. The relationship was not so clearly seen with

sensitivity and did not hold at all for knowledge of development, in general.

(3) Observational experiences tend to result in increased understanding of behavior.

(4) There appears to be no relationship between participation experience and behavioral understanding.

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APPENDIX A

THE FUB

Test Booklet, Answer Sheet and Directions for scoring the
FUB

THE FILM TEST FOR UNDERSTANDING BEHAVIOR

The statements in this booklet are statements about the episodes of behavior you will observe in the film. Some of these statements are simply interpretations of what is happening; some focus on ways of dealing with what is happening; and still others involve predictions of what the child will be like in the future.

You are to read each of these statements and indicate whether you agree with it, disagree with it, or are uncertain about it. You are to indicate your agreement or disagreement by choosing one of the following categories.

A	Ah	U	Dh	D
Agree	Agree, but with some hesitation	Uncertain	Disagree, but with some hesitation	Disagree

This means that if you clearly agree with a statement, choose A for your response. If you are not able to agree completely with a statement, but you agree with it more than you disagree with it, choose the category Ah. The reverse is true for indicating disagreement. If you are so uncertain in your knowledge that you cannot agree or disagree with a statement, or if there is no basis in what you have observed for making a decision about a statement, you choose category U.

You are to indicate your category choice by blackening the appropriate space on a separate answer sheet.

This is illustrated below:

EPISODE 1

	A	Ah	U	Dh	D
1.	■

2.

It is important that you respond to every statement.

If you should change your mind after you have marked an answer, erase the first mark completely and mark again.

Remember, DO NOT MARK IN THIS BOOKLET.

EPISODE 1

1. It is common for children to behave like this in situations which are unfamiliar to them.
2. If an adult would help the child take part in activities rather than just let him sit and watch, he would adjust to the situation more rapidly.
3. Although the child isn't really using the pail and brush, they probably serve as props which help him feel more secure.
4. An adult should suggest that the child move to a place where he can play with his bucket and brush without distraction.
5. Within a week or so the child will play freely with other children.
6. This child is not as well adjusted as a child who meets new people or enters new situations without hesitation.

EPISODE 2

1. Whenever a child uses paint this way, it is a good indication that he is emotionally disturbed.
2. An adult should show the child what the paint is for.
3. The child probably is finding out how paint feels more than she is expressing pent-up feelings.
4. Using paint in this way will nearly always make a child feel guilty.
5. It is likely that the child isn't allowed to be messy at home.
6. If a child is allowed to do things at nursery school which he is not allowed to do at home, he will soon become confused about authority.

EPISODE 3

1. The child seems to be well-adjusted.
2. An adult should suggest that the child do something else.
3. The parents of the child should teach him that it is important to do as the others in a group are doing.
4. An adult should help the child stand on the plank and take part in the rhythms.
5. It is likely that the child is insecure.
6. The child seems to be enjoying himself even though he is not doing as the others are doing.

EPISODE 4

1. The child really didn't need the help that was given.
2. The child was becoming upset over not being able to get her trousers on by herself.
3. The child's persistence in trying to put on her trousers is unusual for this age.
4. The adult should use this situation to teach the child to be more efficient in dressing.
5. Using the bathroom in front of other people will not hinder the development of a child's modesty.
6. The next time the child has a problem in dressing she is apt to want help from an adult.

EPISODE 5

1. The way the child smears the paint on the leaf is typical of this age.
2. The experience would have been more valuable to the child had he made a good print of the leaf.
3. If the child really had been interested in what he was doing, he would have shown more feeling about not making a good picture.
4. Apparently, the child doesn't care that his picture is a poor one.
5. An adult should have helped the child make a better picture.
6. When the child realized that there were two pieces of paper, he really knew that a print of the leaf wouldn't be on the top one.

EPISODE 6

1. If a child of this age is allowed to eat with his fingers, he is apt to be slow in learning proper table manners.
2. The child seemed to enjoy his food as much when he was eating with his fork as he did when he was eating with his fingers.
3. A child of this age should not be allowed to wipe his messy hands on his trousers when eating.
4. It seems to be easier for the child to eat with his fingers than with his fork.
5. The adult should be sure that the child finishes the food on his plate before he leaves the table.
6. It is necessary for children of this age to understand that mealtime is a time for eating rather than a time for playing or just looking around.

EPISODE 7

1. It is common for children of this age to feel strongly about losing possession of something as unimportant as leaves.
2. The girl should be made to realize that she should not cry over something as unimportant as this.
3. The boys who took the leaves from the wagon should be punished.
4. The boys took the leaves from the girl's wagon probably because they didn't like her.
5. The girl is apt to be upset for the rest of the morning.
6. Children should be encouraged to express their feelings when they first occur.

EPISODE 8

1. It is likely that the child is well adjusted, since he is so free and confident in his body movements.
2. The child has good control of his small muscles as well as his large ones.
3. As an adolescent, the child is apt to excell in athletics.
4. The child is ready to use older children's play equipment.
5. An adult should have been near the child when he was playing on the bars.
6. The child seems to derive a great deal of satisfaction from physical activity.

EPISODE 9

1. Leaving the girls to settle their differences by themselves was a good idea.
2. It is likely that the kind of activity that was going on around the girls influenced the way they behaved toward each other.
3. It is likely that the girl who took the toy fights a lot with other children.
4. Some children behave in hostile, aggressive ways when they feel unsure of themselves.
5. The girl who took the toy should be punished.
6. An adult should help the timid girl stand up for her rights.

EPISODE 10

1. Assuming that the children are the same age, it is likely that the boy is more intelligent than the girl.
2. The girl seems bothered by not being able to work the puzzle.
3. Probably the boy and girl have similar intelligence but differ in the amount of practice they have had in working puzzles.
4. The boy gets so tense when he is working a puzzle that he should not be allowed to do this often.
5. An adult should help the girl work the puzzle.
6. It is not a good idea to let a child experience failure as this girl did.

A Ah U Dh D
 Agree Agree, but with Uncertain Disagree, but Disagree
 some hesitation with some

EPISODE 5					EPISODE 7				
A	Ah	U	Dh	D	A	Ah	U	Dh	D
1.	1.	..	..	..	..
2.	2.	..	..	..	..
3.	3.	..	..	..	..
4.	4.	..	..	..	..
5.	5.	..	..	..	..
6.	6.	..	..	..	..

EPISODE 6					EPISODE 8				
A	Ah	U	Dh	D	A	Ah	U	Dh	D
1.	1.	..	..	..	..
2.	2.	..	..	..	..
3.	3.	..	..	..	..
4.	4.	..	..	..	..
5.	5.	..	..	..	..
6.	6.	..	..	..	..

Page 3

A	Ah	U	Dh	D
Agree	Agree, but with some hesitation	Uncertain	Disagree, but with some hesitation	Disagree

EPISODE 9	A	Ah	U	Dh	D	EPISODE 10	A	Ah	U	Dh	D
1.	1.	..	..	..	..	..
2.	2.	..	..	..	..	..
3.	3.	..	..	..	..	..
4.	4.	..	..	..	..	..
5.	5.	..	..	..	..	..
6.	6.	..	..	..	..	..

A	Ah	U	Dh	D		A	Ah	U	Dh	D
Agree	Agree, but with some hesitation	Uncertain	Disagree, but with some hesitation	Disagree		Agree	Agree, but with some hesitation	Uncertain	Disagree, but with some hesitation	Disagree

EPISODE 5					EPISODE 8						
A	Ah	U	Dh	D	A	Ah	U	Dh	D		
1.	+2	+1	0	-1	-2	1.	-1	+1	+2	0	-2
2.	-2	-1	0	+1	+2	2.	-1	+1	+2	0	-2
3.	-2	-1	0	+1	+2	3.	-1	+1	+2	0	-2
4.	+2	+1	0	-1	-2	4.	0	+2	+1	-1	-2
5.	-2	-1	0	+1	+2	5.	-2	-1	0	+2	+1
6.	-2	-1	0	+1	+2	6.	+2	+1	0	-1	-2
EPISODE 6					EPISODE 9						
1.	-2	-1	0	+1	+2	1.	-2	-1	0	+1	+2
2.	-2	-1	0	+1	+2	2.	+2	+1	0	-1	-2
3.	+2	+1	0	-1	-2	3.	-1	+1	+2	0	-2
4.	-2	-1	0	+1	+2	4.	+2	+1	0	-1	-2
5.	-2	-1	0	+2	+1	5.	-2	-1	0	+1	+2
6.	-2	-1	0	+1	+2	6.	+2	+1	0	-1	-2
EPISODE 7					EPISODE 10						
1.	+2	+1	0	-1	-2	1.	+2	-1	0	-1	-2
2.	-2	-1	0	+1	+2	2.	-2	-1	0	+1	+2
3.	-2	-1	0	+1	+2	3.	-1	+1	+2	0	-2
4.	-2	-1	0	+1	+2	4.	-2	-1	0	+1	+2
5.	-2	-1	+1	+2	0	5.	-2	-1	0	+1	+2
6.	+2	+1	0	-1	-2	6.	-2	-1	0	+1	+2

APPENDIX B

DIRECTIONS FOR SUBJECTS TAKING THE FUB

DIRECTIONS FOR SUBJECTS TAKING THE FUB

- (1) The reason for taking the test:
 - (a) it is a part of a research project which aims at determining if there is any relationship between the number of courses taken in child development and psychology, and one's understanding of child behavior.
 - (b) your scores on the test will not be related in any way to your grade in class.
 - (c) your test scores will be made available to you and interpreted to you.

- (2) Description of the test:
 - (a) a brief description of the film.
 - (b) a brief description of the items and nature of the responses to the items.
 - (c) an outline of the procedure to be followed in taking the test.
 1. observe a single episode.
 2. when the film is stopped, rate the items for the episode observed.
 3. mark only on the answer-sheets.
 4. do not read the items prior to seeing an episode of behavior.

- (3) Obtaining background information: Ask each student to put the name and/or the number of each course in child development and psychology taken, at the top of the answer-sheet.

ANALYSIS OF VARIANCE FOR EXPERIMENTAL GROUPS

I. GUIDANCE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups	4	2196.05	549.01
Within	71	4064.99	57.25
Total	75	6261.04	

$$F_{4,71} = \frac{549.01}{57.25} = 9.5897 \text{ significant at the } 0.01 \text{ level.}$$

II. SENSITIVITY SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups	4	389.15	97.29
Within	71	1545.38	21.77
Total	75	1934.53	

$$F_{4,71} = \frac{97.29}{21.77} = 4.469 \text{ significant at the } 0.01 \text{ level.}$$

III. KNOWLEDGE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups	4	1081.82	270.46
Within	71	3884.85	54.72
Total	75	4966.67	

$$F_{4,71} = \frac{270.46}{54.72} = 4.9426 \text{ significant at the } 0.01 \text{ level.}$$

ANALYSIS OF VARIANCE FOR CONTROL GROUPS

I. GUIDANCE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups	2	1054.40	527.2
Within	52	2696.95	51.86
Total	54	3751.35	

$$F_{2, 52} = \frac{527.2}{51.86} = 10.1658 \text{ significant at the } 0.01 \text{ level.}$$

II. SENSITIVITY SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups	2	513.30	256.65
Within	52	1227.68	23.61
Total	54	1740.98	

$$F_{2, 52} = \frac{256.65}{23.61} = 10.8703 \text{ significant at the } 0.01 \text{ level.}$$

III. KNOWLEDGE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups	2	774.15	387.08
Within	52	3136.03	60.31
Total	54	3910.18	

$$F_{2, 52} = \frac{387.08}{60.31} = 6.4182 \text{ significant at the } 0.01 \text{ level.}$$

ANALYSIS OF VARIANCE FOR EXPERIMENTAL AND CONTROL GROUPS

I. GUIDANCE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. I Control Gp. I	1	47.26	47.26
Within	24	1689.70	70.40
Total	25	1736.96	

$$F_{1,24} = \frac{47.26}{70.40} = 0.67131 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. II Control Gp. II	1	4.01	4.01
Within	33	1100.28	33.34
Total	34	1104.29	

$$F_{1,33} = \frac{4.01}{33.34} = .12028 \quad \text{Not significant}$$

Source of Variation	Degree of Freedom	Sum of Squares	Mean Square
Experimental Gp. III Control Gp. III	1	144.4	144.4
Within	38	1878.2	49.43
Total	39	2022.6	

$$F_{1,38} = \frac{144.4}{49.43} = 2.92130 \quad \text{Not significant}$$

II. SENSITIVITY SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. I Control Gp. I	1	34.07	34.07
Within	24	731.78	30.49
Total	25	765.85	

$$F_{1,24} = \frac{34.07}{30.49} = 1.11741 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. II Control Gp. II	1	66.41	66.41
Within	33	956.28	28.98
Total	34	1022.69	

$$F_{1,33} = \frac{66.41}{28.98} = 2.2916 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. III Control Gp. III	1	78.4	78.4
Within	38	683.2	17.98
Total	39	761.6	

$$F_{1,38} = \frac{78.4}{17.98} = 4.3604 \quad \text{Significant at 0.05 level.}$$

III. KNOWLEDGE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. I Control Gp.I	1	12.57	12.57
Within	24	1586.05	66.09
Total	25	1598.62	

$$F_{1,24} = \frac{12.57}{66.09} = 0.1902 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. II Control Gp.II	1	11.01	11.01
Within	33	2093.73	63.45
Total	34	2104.74	

$$F_{1,33} = \frac{11.01}{63.45} = 0.1735 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Gp. III Control Gp.III	1	511.22	511.22
Within	38	1948.55	51.28
Total	39	2459.77	

$$F_{1,38} = \frac{511.22}{51.28} = 9.9692 \quad \text{Significant at the 0.01 level.}$$

ANALYSIS OF VARIANCE FOR EXPERIMENTAL GROUPS

I. GUIDANCE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 2	1	890.57	890.57
Within	24	1352.05	56.34
Total	25	2242.62	

$$F_{1,24} = \frac{890.57}{56.34} = 15.8071 \text{ Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 3	1	177.42	177.42
Within	24	522.70	21.78
Total	25	700.12	

$$F_{1,24} = \frac{177.42}{21.78} = 8.1460 \text{ Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 4	1	1218.75	1218.75
Within	24	1359.25	56.64
Total	25	2578	

$$F_{1,24} = \frac{1218.75}{56.64} = 21.5175 \text{ Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 5	1	624.1	624.1
Within	13	921.5	73.96
Total	14	1585.6	

$$F_{1,13} = \frac{624.1}{73.96} = 8.4569 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 3	1	714.02	714.02
Within	38	1357.75	35.73
Total	39	2071.77	

$$F_{1,38} = \frac{714.02}{35.73} = 19.9838 \quad \text{Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 4	1	25.6	25.6
Within	38	1384.3	36.43
Total	39	1409.9	

$$F_{1,38} = \frac{25.6}{36.43} = 0.7027 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 5	1	13.66	13.66
Within	27	986.55	36.54
Total	28	1000.21	

$$F_{1,27} = \frac{13.66}{36.54} = 0.3738 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 3 & 4	1	1010.02	1010.02
Within	38	1464.95	38.55
Total	39	2474.97	

$$F_{1,38} = \frac{1010.02}{38.55} = 26.2003 \quad \text{Significant at 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 3 & 5	1	301.25	301.25
Within	27	1067.20	39.53
Total	28	1368.45	

$$F_{1,27} = \frac{301.25}{39.53} = 7.62079 \quad \text{Significant at 0.05 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 4 & 5	1	59.01	59.01
Within	27	1093.75	40.51
Total	28	1152.76	

$$F_{1,27} = \frac{59.01}{40.51} = 1.4567 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 4 & 5	1	59.01	59.01
Within	27	1093.75	40.51
Total	28	1152.76	

$$F_{1,27} = \frac{59.01}{40.51} = 1.4567 \quad \text{Not significant}$$

ANALYSIS OF VARIANCE FOR CONTROL GROUPS

I. GUIDANCE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 1&2	1	993.61	993.61
Within	33	1537.93	46.60
Total	34	2531.54	

$F_{1,33} = \frac{993.61}{46.60} = 21.3221$ Significant at the 0.01 level.

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 1&3	1	462.4	462.4
Within	38	2235.2	58.82
Total	39	2697.6	

$F_{1,39} = \frac{462.40}{58.82} = 7.8613$ Significant at the 0.01 level.

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 2&3	1	134.87	134.87
Within	33	1620.73	49.11
Total	34	1755.6	

$F_{1,33} = \frac{134.87}{49.11} = 2.7463$ Not significant

ANALYSIS OF VARIANCE FOR EXPERIMENTAL GROUPS

II. SENSITIVITY SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 2	1	22.00	22.00
Within	24	747.38	31.14
Total	25	769.38	

$$F_{1,24} = \frac{22.00}{31.14} = 0.7065 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 3	1	9.93	9.93
Within	24	539.03	22.46
Total	25	548.96	

$$F_{1,24} = \frac{9.93}{22.46} = 0.4422 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 4	1	64.33	64.33
Within	24	418.63	17.44
Total	25	482.96	

$$F_{1,24} = \frac{64.33}{17.44} = 3.6886 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 5	1	28.9	28.9
Within	13	268.83	20.68
Total	14	297.73	

$$F_{1,13} = \frac{28.9}{20.68} = 1.3975 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 3	1	130.22	130.22
Within	38	1003.75	26.41
Total	39	1133.97	

$$F_{1,38} = \frac{130.22}{26.41} = 4.9307 \quad \text{Significant at the 0.05 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 4	1	24.02	24.02
Within	38	880.35	23.17
Total	39	904.37	

$$F_{1,38} = \frac{24.02}{23.17} = 1.0367 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 5	1	2.62	2.62
Within	27	730.55	27.06
Total	28	733.17	

$$F_{1,27} = \frac{2.62}{27.06} = 0.9682 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 3 & 4	1	270.4	270.4
Within	38	672.0	17.68
Total	39	942.4	

$$F_{1,38} = \frac{270.4}{17.68} = 15.2941 \quad \text{Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 3 & 5	1	114.77	114.77
Within	27	532.20	19.71
Total	28	646.97	

$$F_{1,27} = \frac{114.77}{19.71} = 5.8229 \quad \text{Significant at the 0.05 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 4 & 5	1	5.03	5.03
Within	27	401.80	14.88
Total	28	406.83	

$$F_{1,27} = \frac{5.03}{14.88} = 0.3380 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 4 & 5	1	5.03	5.03
Within	27	401.80	14.88
Total	28	406.83	

$F_{1,27} = 0.3380$ is not significant at the 0.05 level.

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 4 & 5	1	5.03	5.03
Within	27	401.80	14.88
Total	28	406.83	

$F_{1,27} = 0.3380$ is not significant at the 0.05 level.

ANALYSIS OF VARIANCE FOR CONTROL GROUPS

II. SENSITIVITY SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 1 & 2	1	506.01	506.01
Within	33	940.68	28.51
Total	34	1446.69	

$$F_{1,34} = \frac{506.01}{28.51} = 17.7485 \text{ Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 1 & 3	1	164.02	164.02
Within	38	875.95	23.05
Total	39	1039.97	

$$F_{1,39} = \frac{164.02}{23.05} = 7.1158 \text{ Significant at the 0.05 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 2 & 3	1	113.16	113.16
Within	33	638.73	19.36
Total	34	751.89	

$$F_{1,33} = \frac{113.16}{19.36} = 5.8450 \text{ Significant at the 0.05 level.}$$

ANALYSIS OF VARIANCE FOR EXPERIMENTAL GROUPS

III. KNOWLEDGE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 2	1	333.46	333.46
Within	24	1829.50	76.23
Total	25	2162.96	

$$F_{1,24} = \frac{333.46}{76.23} = 4.3744 \text{ Significant at the 0.05 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 3	1	219.74	219.74
Within	24	1298.30	54.09
Total	25	1518.04	

$$F_{1,24} = \frac{219.74}{54.10} = 4.0617 \text{ Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 4	1	475.49	475.49
Within	24	1552.05	64.67
Total	25	2027.54	

$$F_{1,24} = \frac{475.49}{64.67} = 7.352 \text{ Significant at the 0.05 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 1 & 5	1	220.9	220.9
Within	13	1111.5	85.5
Total	14	1332.4	

$$F_{1,13} = \frac{220.9}{85.5} = 2.5836 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 3	1	25.6	25.6
Within	38	1856.8	48.86
Total	39	1882.4	

$$F_{1,38} = \frac{25.6}{48.86} = 0.5239 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 4	1	27.22	27.22
Within	38	507384.55	13352.23
Total	39	507411.77	

$$F_{1,38} = \frac{27.22}{13352.23} = 0.2039 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 2 & 5	1	2.76	2.76
Within	27	1670.00	61.85
Total	28	1672.76	

$$F_{1,27} = \frac{2.76}{61.85} = .4462 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 3 & 4	1	105.62	105.62
Within	38	982.35	25.85
Total	39	1087.97	

$$F_{1,38} = \frac{105.62}{25.85} = 4.08588 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 3 & 5	1	5.41	5.41
Within	27	1138.8	42.18
Total	28	1144.21	

$$F_{1,27} = \frac{5.41}{42.18} = 0.1283 \quad \text{Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Experimental Groups 4 & 5	1	33.31	33.31
Within	27	1392.55	51.58
Total	28	1425.86	

$$F_{1,27} = \frac{33.31}{51.58} = 0.6458 \quad \text{Not significant}$$

ANALYSIS OF VARIANCE FOR CONTROL GROUPS

III. KNOWLEDGE SUB-SCALE

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 1 & 2	1	696.86	696.86
Within	33	2120.28	64.25
Total	34	2817.14	

$$F_{1,33} = \frac{696.86}{64.25} = 10.8461 \text{ Significant at the 0.01 level.}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 1 & 3	1	196.0	196.0
Within	38	2059.9	54.21
Total	39	2255.9	

$$F_{1,38} = \frac{196.0}{54.21} = 3.6156 \text{ Not significant}$$

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square
Control Groups 2 & 3	1	497.26	497.26
Within	33	2185.48	66.23
Total	34	2682.74	

$$F_{1,33} = \frac{497.26}{66.23} = 7.5081 \text{ Significant at the 0.01 level.}$$