

The Hawthorne Effect: Awareness of Experimental  
Participation  
or Experimental Demands?

by

James Carlopio

A thesis  
presented to the University of Manitoba  
in partial fulfillment of the  
requirements for the degree of  
Master of Arts  
in  
Psychology

Winnipeg, Manitoba, 1982

James Carlopio, 1982

THE HAWTHORNE EFFECT: AWARENESS OF EXPERIMENTAL  
PARTICIPATION  
OR EXPERIMENTAL DEMANDS?

BY

JAMES CARLOPIO

A thesis submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
of the degree of

MASTER OF ARTS

© 1982

Permission has been granted to the LIBRARY OF THE UNIVERSITY OF MANITOBA to lend or sell copies of this thesis, to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film, and UNIVERSITY MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

I hereby declare that I am the sole author of this thesis.

I authorize the University of Manitoba to lend this thesis to other institutions or individuals for the purpose of scholarly research.

James Carlopio

I further authorize the University of Manitoba to reproduce this thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

James Carlopio

The University of Manitoba requires the signatures of all persons using or photocopying this thesis. Please sign below, and give address and date.

## ACKNOWLEDGEMENTS

The author would like to acknowledge Dr. John Adair for his guidance and monetary support for research materials. Appreciation is also expressed to Dr. D. Perlman and Dr. B. Notz for their comments and support. Special thanks to Dr. R.C.L. Lindsay and Ms. D. Benoit, for without their help and friendship this thesis would not have been completed.

## ABSTRACT

The classic methodological artifact known as the "Hawthorne Effect" has long concerned investigators who conduct experiments in field settings. The artifact is considered the problem that subjects' knowledge that they are in an experiment presumably will modify their behavior from what it would have been without that knowledge. Over the years, the artifact has been defined and conceptualized in various ways. A review of the literature revealed conflicting results that were generally non-supportive of awareness of participation as a sufficient condition for biasing data. A re-conceptualization of the Hawthorne effect as occurring only when experimental subjects perceive a demand for a change in performance was proposed to explain the conflicting evidence. These conceptualizations were examined in the present study by orthogonally manipulating awareness of participation and the experimental demands on subjects in an educational paradigm similar to that used by Johnson & Foley (1969). Two hundred students in introductory psychology classes were tested, half of them as subjects in an experiment, and half as "filling class time." Both the experimental subjects and those remaining in class discussed in pairs a set of preselected questions regarding a chapter in their

textbook. The students then completed a multiple-choice test as the primary dependent measure. As expected, the results showed no support for an effect due merely to the subjects' awareness of their participation. However, the results showed no support for the expected effects due to the experimental demands. The failure to support either hypothesis was attributed to the ineffectiveness of the manipulations. A large number of subjects who remained in the classroom, reported being aware of their participation in an experiment. The demand manipulation worked as expected only for the subjects who were led to believe that they were not in an experiment. In view of the lack of evidence found in this study and in the many previous studies testing for the Hawthorne effect, the extensive procedures frequently used to control for Hawthorne effects may not be warranted in every study.

## CONTENTS

|   |             |
|---|-------------|
| ACKNOWLEDGEMENTS . . . . .                                      | iv          |
| ABSTRACT . . . . .  | v           |
|   | <u>page</u> |
| INTRODUCTION . . . . .  | 1           |
| The Hawthorne Experiments . . . . .                             | 1           |
| Later Research . . . . .  | 4           |
| A re-conceptualization of the Hawthorne effect . . . . .        | 9           |
| Statement of the problem . . . . .                              | 11          |
| METHOD . . . . .  | 15          |
| Subjects, Classes, and Experimenter . . . . .                   | 15          |
| Experimental Design . . . . .                                   | 16          |
| Procedure . . . . .   | 16          |
| For subjects in the classroom . . . . .                         | 17          |
| For subjects in the experiment . . . . .                        | 18          |
| Manipulation of Demand Characteristics for<br>Success . . . . . | 18          |
| Postexperimental Questionnaire (PEQ) . . . . .                  | 19          |
| RESULTS . . . . .   | 21          |
| Manipulation checks . . . . .                                   | 21          |
| Awareness of participation . . . . .                            | 21          |
| Demand . . . . .  | 22          |
| Discarded Subjects . . . . .                                    | 23          |
| Replications . . . . .  | 24          |
| Test of the hypotheses . . . . .                                | 26          |
| Secondary Analyses of Hypotheses . . . . .                      | 27          |
| DISCUSSION . . . . .  | 28          |
| FOOTNOTES . . . . .   | 35          |
| REFERENCE NOTES . . . . .                                       | 36          |
| REFERENCES . . . . .  | 37          |



## INTRODUCTION

The classic methodological artifact known as the "Hawthorne Effect" has long concerned investigators who conduct experiments in field settings. Early researchers vaguely conceptualized the artifact as being the result of social-situational factors involved in experimentation. The artifact came to be generally regarded as the problem that subjects' knowledge that they are in an experiment presumably will modify their behavior from what it would have been without that knowledge. In this paper the original "Hawthorne" research, as well as studies intentionally manipulating variables to produce the effect, will be reviewed. An experiment will be reported which empirically investigates two factors potentially mediating the effect: knowledge of being in an experiment and experimental demands on performance.

### The Hawthorne Experiments

The Hawthorne effect takes its name from the Western Electric Company's Hawthorne works in Chicago, Illinois where the original studies took place. The early research at the plant was conducted from November, 1924 to April, 1927 and is referred to as the Illumination studies. C.E. Snow

was responsible for this early research at Hawthorne, under the supervision of the Committee on Industrial Illumination, of the Division of Engineering and Research of the National Research Council.

The results from the first Illumination study, due to inadequate control over the levels of illumination, disclosed little concerning the effects of lighting on productivity, yet "...brought out very forcibly the necessity of controlling or eliminating the various additional factors which affected production output" (Snow, 1923, p. 272). The second study's results similarly shed no light on the effects of illumination due to "... a lack of a definite control of the illumination intensities" (p. 272). The final Illumination study conducted at Hawthorne used an experimental-control group design, with lighting that was artificially controlled and systematically decreased for the experimental group from ten foot-candles to three foot-candles in decrements of one foot-candle, while being held constant at ten foot-candles for the control group. This procedure produced a slow but steady increase in the efficiencies of both test and control groups. These results suggested that the worker's performance was not only independent of the manipulation of illumination but must have been influenced by some other variables which were present yet unaccounted for in the experimental situation. Snow, based on the results of these and several other illumination studies conducted in the Eastern United

States , concluded that "Any investigation attempting to evaluate definitely the effect of illumination or some such influence, must take the greatest of pains to control or eliminate all factors but the one being studied. Many of them can be controlled or eliminated, but the one great stumbling block remaining is the problem of the psychology of the human individual" (p. 282). This research and its conclusions sensitized subsequent researchers at Hawthorne to the need for control over, or elimination of, confounding variables.

The next, and better known set of research at Hawthorne took place from the Spring of 1927 to May of 1932. These studies were a cooperative venture between the company and the School of Industrial Relations at Harvard University. In the first Relay Assembly Test Room study, which was started as a result of the Illumination experiments (Roethlisberger & Dickson, 1939), the experimenters went to great lengths to isolate the subjects, to standardize the task and workers' experience, and to solicit the workers' opinions, feelings and attitudes. This first study was basically designed to examine the effects of varying combinations and lengths of rest and work periods on worker productivity. The five women participating as subjects were isolated in a test room that was as similar as possible to their regular shop floor. Their task was standardized and meticulous records were kept regarding production (quality and quantity),

the women's health and happiness, and their verbal and non-verbal behavior. The subjects' overall production increased by about 30 percent in the first two years. Regardless of what the researchers manipulated, rest pauses, lunches, etc., the workers performance improved. When the subjects were returned to their original working conditions (i.e., no breaks or shorter work weeks or lunches), their output also continued to increase. Thus these researchers were forced to consider the contribution of unintentional changes made in their zeal to provide a controlled, yet natural experimental situation. The Hawthorne experimenters had changed the form of supervision, had given special privileges, attention and consideration to the experimental workers, and had so totally altered the social work situation that these unintentionally manipulated factors may have been what caused the subjects to increase their production.

### Later Research

French (1950) twenty years later, first named the artifact as a problem in field studies. Since that time, the effect has been considered a serious problem and has been controlled for and studied regularly.

The literature since Hawthorne provides conflicting results which are generally non-supportive of the existence of a Hawthorne "mere awareness" effect. Cook (1967) reviewed the relevant literature and conducted his own extensive re-

search project on the topic. He found little, if any support for a Hawthorne effect. Cook concluded that the "ideas and beliefs about the role of the Hawthorne effect lack sufficient validity ... to warrant their serious consideration by researchers ..." (p. 121). More recently, Diamond (Note 1) reviewed the educational and industrial literature, and conducted two studies of her own. She feels that the "most telling aspect" of her entire review is "the extreme paucity of evidence for the powerful Hawthorne effects that most researchers fear" (p. 40).

There are several more recent studies, not covered in the Cook and Diamond reviews in which attempts were made to control or to produce Hawthorne effects (Rubeck, 1975; Olson, 1968; Flohr, 1976; Wool, 1977). Three of these studies were designed to assess Hawthorne effects using pre and post test measures on grade-school children, and found no evidence for effects due to subject's awareness of participation. Rubeck (1975) manipulated awareness of experimental participation and time limits on an achievement test and found no significant increase in achievement. Olson (1968) manipulated awareness of experimental participation and a change in supervision and found no significant effects on a test of mental ability. Flohr (1976) manipulated awareness of experimental participation, supervision and novelty of the task, and again found no effects on an addition facts test.

The fourth study, conducted in an applied setting by Wool (1977), varied the special attention and interest of management directed at one building on the grounds of a large institution for the mentally retarded. In one condition, management never visited the building. In the second management periodically visited the building. In the third, management not only visited the building but interacted with the workers and clients. Wool reported finding no significant differences across the three conditions on measures of either employee attendance or client restraint. These four studies further illustrate the general lack of empirical results showing the existence of a Hawthorne effect.

In a few studies some expected performance differences were claimed to have been obtained with the intentional manipulation of variables designed to produce a Hawthorne effect (Simpson, 1977; Dignan, 1979; Rosen & Sales, 1960). Simpson (1977) manipulated awareness of experimental participation (experiment and no experiment controls) under two academic levels (graduate and undergraduate) from two academic curricula (English or Behavioral Science). Although Simpson found no main effect on the learning of paired-associates for experimental vs control subjects, thus providing no evidence for an effect due to mere experimental awareness, he did find that one of his four experimental groups performed significantly better than the other three. If this can be considered evidence of a Hawthorne effect,

which seems highly questionable, the effect was specifically confined to graduate students in English who were told they were in an experiment.

Dignan (1979) used a pre-test and post-test measure to assess the effects of telling university students that they were part of an experiment at the beginning of the school year. The students of an introductory health education course were pre-tested regarding their knowledge concerning contraceptive devices. The materials and methods used to teach a unit on contraception were "... carefully controlled and specified to minimize differences in instruction between classes" (p.1222). At the post-test, the experimental class mean was significantly higher than the control class mean. Although the author admits he is not certain whether these changes in test scores can be attributed to a Hawthorne effect exclusively, the results are supportive of the notion that mere awareness of participation effects learning of course material as a measure of performance.

In an industrial setting, Rosen and Sales (1966) unobtrusively took a two-week baseline measure of workers productivity levels in a furniture manufacturing plant. They then led the workers and their union to believe that for two weeks a study of the workers' attitudes and working conditions would be conducted. Rosen and Sales again measured the workers' productivity to assess the effects of the behavioral research in the plant. Performance measures were

also taken for a two-week period after the experimental treatment was removed, although they had no direct relevance to the current discussion. Post-hoc analyses revealed that worker's mean production declined non-significantly from the baseline period to the experimental period. Thus there was no evidence of a significant difference in productivity due to subjects being aware that they were in an experiment. However, Rosen and Sales assessed several "moderator variables" they felt might interact with the effect of the research operations. The younger workers, those with urban backgrounds, and those active in the union, seemed to have reacted negatively toward the presence of the experimental operations by decreasing their production during the experimental period as compared to their baseline period. The older workers, those with rural backgrounds, and those not active in the union seemed to have been effected more positively, such that their performance increased when they knew they were in the experiment as compared to their baseline level. It seems that the experimental manipulation had opposing effects on the two groups of workers. These two groups of workers evidently perceived the research project differently, and each reacted in accordance with their perceptions.

In conclusion, there seem to be studies which produce, under questionable or highly specific conditions, some changes in performance due to the subjects' knowledge of



their participation in an experiment. However, the majority of studies discussed here or in the reviews by Diamond and Cook, fail to find the expected effects. Given these generally inconclusive or non-supportive results, the evidence for the existence of a Hawthorne effect, due only to subjects' knowledge of their experimental participation, is lacking.

#### A re-conceptualization of the Hawthorne effect

Adair (Note 2) has shown that there is confusion regarding the conceptualization of the Hawthorne effect and how it is mediated. The effect has been seen by some investigators as a "novelty" effect, as "similar to experimental demands," as the "experimenter-attention effect," and as "the opposite of evaluation apprehension." Adair notes that there are ten mediators of the effect that have been proposed in experimental methods textbooks. Among others, knowing one is in an experiment, supervision changes, special privileges, attention and consideration, and knowing that performance is important and is being monitored have been proposed. How can the Hawthorne effect be adequately studied and empirically demonstrated when there is no consistent satisfactory definition or conceptualization of the phenomena?

A more fruitful line of inquiry into the working of experimental reactivity than that which has been taken, may be that which has been proposed by Adair (Note 2), i.e. identi-

fy the conditions under which subjects' reactivity can be found to operate and study the factors mediating such artifacts. Two possible mediators of the Hawthorne effect were examined in a study conducted by Johnson & Foley (1969). They examined reactivity, in terms of subjects' "mere awareness" of participation and experimental demands, in terms of the experimenters' expectations of the subjects' performance, to see which, if either, produced a performance effect.

Johnson & Foley created three groups of subjects from each of four Summer session introductory psychology classes. Two-thirds of the students in each class were taken out of their classroom and were further subdivided into two groups. These subjects were then told they were to participate in research on a new approach to learning. One of these groups, the experiment-expectation group, was led to believe that they were testing a new approach that was demonstrated to have been highly successful, and that they would learn a great deal from it. The other group, the experiment-no expectation group, was told that the value of the new teaching method had not been determined. The students who remained in their classroom, the no-experiment, no-expectation information group, were led to believe that they were participating in a task in order to fill time while their classmates were out of the room participating in an experiment.

In reality, all three treatment groups participated in a structured discussion on the same subject matter, and were treated similarly. Following their discussions in same sex pairs, the pairs were separated in order to complete an achievement test on the material they had discussed. The positive expectation-experiment subjects did significantly better on all measures than did the no expectation-experiment subjects or the no experiment time fillers. The fact that there were no significant performance differences between the no expectation-experiment and no expectation-no experiment subjects suggests that merely being aware of experimental participation was not enough to produce a Hawthorne effect. Thus, only the presence of both awareness of participation and positive demand information seemed to yield the facilitative effect.

This highlights the importance of the subjects' thoughts about the experiment. Adair (Note 2) noted that the importance of subjects' expectations, although central to Roethlisberger and Dickson's concerns, has never been made as salient in discussions of the Hawthorne effect as mere awareness of participation in an experiment.

#### Statement of the problem

Thirty years after the Hawthorne effect has been identified, we are no closer to understanding it than were Roethlisberger & Dickson when they compiled the original account

of the research at Hawthorne. Conceptualizing the effect as the result of subjects becoming aware of their participation in an experiment has led scores of researchers to come to the conclusion that no such effect occurs. The problem then becomes one of identifying alternative explanations for the artifactual reactivity found at Hawthorne and experimentally examining these alternatives to assess their validity. The Ornian demand characteristics notion suggests such an alternative explanation. Orne (1973) holds that in any study the subjects look for cues in the experimental situation which they use to guide their behavior. These cues, or experimental demands, may be explicit or subtle, and may or may not have been planned by the experimenters. At Hawthorne a controlled experimental setting was created in which meticulous production records were kept, special apparatus was designed to facilitate the collection of the performance data, and the workers were given regular performance feedback. The workers, may have perceived the researcher's interest in their production as a desire for an increase in productivity. Thus the subjects' perceptions that the experimenters wanted them to improve their performance and was giving them special treatment as an incentive to do so, may be responsible for the great increases in subjects' performance obtained.

To test this notion, it would seem that a study might usefully take what is alleged to be the key element from the

Hawthorne effect (i.e., subjects' awareness of experimental participation) and the key element from the demand characteristic notion (i.e., experimental demands) and manipulate them in a manner which allows a-priori predictions of when the Hawthorne effect will and will not occur. Therefore the present study employed a 2 x 2 factorial design, manipulating two levels of subjects' awareness of participation and two levels of experimental demands to assess its effects on subjects' performance. Using the Johnson and Foley "experimental" method, subjects' performance on a multiple-choice test was the primary dependent measure.

Since the great majority of results from past research indicate that performance effects are not due to mere "awareness" of participation in an experiment, it was expected that no main effect of awareness of participation would be found on subjects' performance on the multiple choice test. Based on Orne's notion of demand characteristics, it was predicted that the subjects who were told that they should learn a lot because the teaching method has been proven useful would react to the demand and perform better. Therefore, a main effect for expectancy on test performance was predicted.

The null hypothesis that no relationship existed between the "demand" and "awareness" manipulations was accepted until proven otherwise. The demand and awareness notions were postulated independently to account for the results at Hawt-

horne. Therefore, no interaction effects were expected. Specifically it was hypothesized that:

1. There will be a main effect for expectancy on performance on the multiple-choice test.
2. There will be no main effect for "awareness" of participation on performance on the multiple choice test.
3. There will be no interaction effect of expectancy and awareness on performance on the multiple choice test.

## METHOD

### Subjects, Classes, and Experimenter

The subjects were 197 students enrolled in four sections of the introductory psychology course at the University of Manitoba. All students present in the classes on the days of the experiment participated.

Two of the four classes met for an hour and twenty minutes during the day. The other two classes met for two hours and forty minutes in the evening. The same textbook, agenda items and multiple choice test were used by one day and one evening class, while another text and materials were used by the other classes. One pair of classes discussed and were tested on Chapter 17 on social psychology from Hilgard, Atkinson & Atkinson (1979). The other pair of classes were given Chapter 19 on treatment and therapy of disordered states from Kimble, Garnezy & Zigler (1980).

The experimenter was a male graduate student in his mid twenties who happened to be the teaching assistant for two of the classes. For each class two persons assisted the experimenter to arrange the subjects into pairs, to distribute textbooks, and to collect the materials afterward. The assistants were undergraduate students, except in two sections where the regular graduate teaching assistant for the course

was utilized along with one undergraduate assistant. All assistants were blind to the purpose of the experiment.

### Experimental Design

The experiment consisted of a 2 (demand vs no demand instructions) x 2 (experiment vs no experiment) factorial design. Since two different textbooks were being used, it was decided to run one complete replication with each text. One experiment and one no experiment condition were run within each class. Whether the demand or no demand instructions would be given in each condition was randomly determined. The remaining conditions were tested in the second classroom using the same text. This avoided the possible confound of classroom and textbook and provided two replications of the four experimental conditions.

### Procedure

The experiment was conducted during the first week in March, which is the last full month of classes in the Canadian academic year. The experimenter introduced himself to each class as a graduate student who needed some subjects to participate in an experiment in order to complete his Master's research project. He told them that he would be calling out the names of the people who would be participating in the experiment. The experimenter said, "When I call your name, please gather your belongings and go out into the hall



where my assistant will escort you to the experimental room." A class-list had been obtained prior to this meeting and half the names on the list had been randomly selected to participate in the "experimental" conditions. The students were led to believe that only those leaving the room would be in the experimental condition and that this group had been selected on some special, yet undefined basis.

For subjects in the classroom. The experimenter said to the students remaining in their classroom, "You people will not be participating in the experiment. However, since you are not needed to participate in the experiment your instructor would like you to do a discussion exercise on the chapter in your text which would have been covered if there were a lecture this class period. After I explain your exercise, the assistant will stay and supervise while I leave to go to conduct my experiment."

The assistants then proceeded to distribute the agenda questions and to divide the students into discussion pairs. The experimenter read to these No Experiment subjects, the following instructions on how to proceed with the agenda discussion procedure:

When you get the agenda questions please discuss the first one making sure that both you and your partner understand the correct answer and then go on to the next question. Follow the same procedure for each of the agenda questions. Use your book as much as you

want. Be sure to take each question in order and don't skip any. You will have a half hour to cover as many questions as you can. Try to cover them all. After the half hour is up you will be given a brief multiple choice test on the material covered on the agenda. This test will not count toward your grade.

For subjects in the experiment. After initiating the procedure for the no-experiment subjects, the experimenter went to the room where the experimental subjects had already been arranged into pairs by the other assistant. With the help of the assistant, the experimenter distributed the agenda questions and proceeded to give instructions that reinforced the view that this was an experiment and that they were subjects in it. The experimenter said "I have taken you out of your classroom today to participate in an experiment. I have been working with the CAUT committee on college teaching in trying to improve the teaching of several subjects, including psychology. Today you will be using the agenda discussion technique."

These were followed by the same instructions regarding the agenda discussion technique which had been given to the no-experiment group.

Manipulation of Demand Characteristics for Success. Following these instructions, subjects in the no demand conditions proceeded to discuss the agenda items. Before begin-

ning their discussions, subjects assigned to the demand condition were told that "The agenda discussion technique is a very effective method of teaching which usually produces excellent results. It has been found that students in several universities learned a great deal using the discussion method. You should learn quite a bit today and do well on the end of period test." The no demand information group was not given these instructions.

When the discussion time for each group was over the agenda questions were collected. The paired students were separated and the multiple choice tests and questionnaires were distributed. After the students had completed and handed in their materials they were dismissed. All subjects were debriefed via a form letter containing an explanation of the study's procedures, purposes and results.

#### Postexperimental Questionnaire (PEQ)

After subjects had completed the multiple-choice test, they turned to the next page on the test booklet to a thirteen-item funnel-type postexperimental questionnaire (Page, 1973). The first three PEQ items were used to assess whether subjects had prior knowledge of the discussion material, which subjects had not followed directions, the number of agenda items discussed by the group and how complete this discussion was. Three more items were used to assess the subjects' awareness of their participation while the remain-

ing seven items assessed the subjects' expectation of the method's usefulness and their general satisfaction with the method. For example, subjects were asked to rate how much they enjoyed using the agenda method and if they would like to use this discussion format again.

The scoring of 11 of the 13 items on the questionnaire was done objectively since the answers were on five point scales or required only yes or no answers. Three raters, blind to treatment conditions, rated the subjectively scored items. The initial two raters agreed on 98.6% of the subjective items. The items not agreed upon were decided by checking the third rater's scores.

### Materials

All materials used in the experiment, including the two sets of discussion questions, the multiple-choice tests, and the postexperimental questionnaire, are included in the Appendix.

## RESULTS

Whether or not subjects were told they were in an experiment, and whether or not subjects were told that the experimenter expected them to do well on the end of period test assessing their knowledge of the agenda material were manipulated in a 2 x 2 factorial design. Since these manipulations had been effective in the Johnson and Foley study, they were employed in the present investigation without pre-testing. However, checks of the effectiveness of these manipulations were incorporated into the PEQ.

### Manipulation checks

Awareness of participation. Three PEQ items were used to assess subjects' awareness of their participation in an experiment. Two items asked for the subjects' perceptions of the reasons they were given the discussion exercise and the test on the material they discussed. The third question directly asked subjects if they thought they were participating in an experiment. Although all experimental subjects had been told they were participating in an experiment, nine of them reported being unaware of their participation.

Although it was expected that a majority of the no-experiment subjects would report being unaware of their experi-

mental participation, only 35 of the 105 subjects in this condition could be classified as unaware. Seventy no experiment subjects stated that they were aware of being in an experiment.

In order to examine if the distribution of aware and unaware subjects differed across conditions, and thus test the effectiveness of the manipulation of subjects' awareness of their participation, a 2(Experiment vs no Experiment) x 2(Demand vs no Demand) analysis of variance (ANOVA) tested the probability that subjects were classified as aware. The results indicated a main effect for Experiment,  $F(1,194)=21.11$ ,  $P<.001$ , as well as a main effect for demand,  $F(1,194)=8.28$ ,  $P<.004$ . The interaction did not reach significance ( $F=1.79$ ). The percentages of subjects being classified as clearly aware were 90% and 67% for the Experiment and No Experiment conditions, and 71% and 84% for the Demand and No Demand conditions. Clearly, the manipulation of subjects' awareness of experimental participation was not effective in either producing unaware subjects in the no experiment conditions, or producing equal numbers of aware and unaware subjects across the demand conditions.

Demand. To assess the effect of the manipulation of demands for success on the task, a 2 x 2 ANOVA was performed on subjects' responses to the PEQ item assessing their expectations of how much they would learn using the agenda discussion technique. The item was a five point scale rang-

ing from (1), expected to learn a lot more using the agenda technique as compared to reading the chapter alone, to (5) expected to learn less. It was hoped that the instructional demands of telling subjects that they were expected to do well on the test would influence their expectations of how much they would learn. It was predicted that there would be a significant main effect for the demand manipulation on subjects' responses to this item if the manipulation was successful. The results indicated that a main effect for demand was significant,  $F(1,194)=7.04$ ,  $P<.01$ , with the demand subjects reporting they expected to learn more ( $M=2.6$ ) than the no demand subjects ( $M=3.0$ ).

However, there was also a significant interaction among the four group means,  $F(1,192)=11.83$ ,  $P<.01$ . The means for the experiment demand and no demand subjects were 2.9 and 2.8 respectively. The means for the no experiment demand and no demand subjects were 2.3 and 3.2. These figures reveal that the demand manipulation seems to have worked for the no experiment subjects only.

#### Discarded Subjects

Regardless of the difficulties with the manipulated variables, all subjects, except those described below, were included in the later analyses. Secondary analyses of the hypotheses were conducted, and will be reported, which include only those subjects' data for whom the manipulations worked.

For all of the remaining analyses, the eight subjects who had admitted reading the discussion chapter prior to class, and the nine subjects who reported that they had not discussed any of the agenda items, were discarded. It was felt that these subjects either did not meet the initial criterion, or had not followed the experimental instructions. In either case their data would be biased and should not be included.

### Replications

Before proceeding to examine the experimental hypotheses, the subjects' performance data were tested for effects of the two replications. If there were differences between the two replications it was expected that they would be due to one test or chapter being more difficult than the other. It was also expected that any differences would be main effects, and that the effect of replication would not interact with either of the manipulated variables. These predictions were supported by a 2(Experiment vs no experiment) X 2(Demand vs no demand) X 2(replication one vs replication two) ANOVA applied to subjects' performance data. A main effect of replication was found on the number of questions the subjects answered correctly on the multiple-choice test,  $F(1,164)=8.03$ ,  $p<.005$ . The students in the replication using Kimble, Garnezy & Zigler (1980), who discussed and were tested on the treatment and therapy of disordered states,



scored a mean of 11.0 correct out of eighteen. The students in the second replication using Hilgard, Atkinson & Atkinson (1979), who discussed and were tested on social psychology scored an average of 9.9 correct. The interaction was non-significant ( $F < 1$ ). This suggests that the tests likely differed in difficulty but that performance was not differentially affected across the manipulated conditions.

In addition to the absolute number of items correct on the test, it was possible to score the items correct as a percentage of the total number of questions each subject reported discussing. Subjects who discussed more questions obviously would also have had a greater opportunity to respond to more test items correctly. The results of this analysis were the same as those using the absolute means, i.e., the percentage of correct responses based on the number of agenda items each subject reported their pair had discussed showed a significant replication main effect,  $F(1,164)=53.07$ ,  $P < .001$ , while the interaction was nonsignificant ( $F < 1$ ). The replication using Kimble et al. averaged 73.8% correct, and the replication using Hilgard et al. scored 56.2% correct.

In light of these differences in number of items discussed and in the differences between replications, it seemed appropriate to convert all data to standardized ( $z$ ) scores. This had the effect of removing the main effect variance due to the differences between the materials and

texts used in the two replications. The data were then collapsed over replications and these performance data were utilized in the following analyses of the hypotheses.

### Test of the hypotheses

The experimental hypotheses were concerned with the effects of awareness of experimental participation and perceived experimental demands on the subjects' performance on the multiple-choice test. According to this analysis, the hypothesis that there would be a main effect on subjects' performance due to demand was not supported. The standardized mean number correct for subjects who perceived the demand instructions ( $M=0.07$ ), although in the right direction was not significantly greater than the mean ( $M=-0.08$ ) for the subjects who did not receive the demand instructions ( $F<1$ ). Similarly, there was no significant difference on the percentage of items correct of those discussed ( $F<1$ ).

In the second hypothesis it was expected there would be no main effect of awareness of experiment participation on subjects' performance on the multiple choice test. It was found on the standardized mean number of correct responses that the subjects who were told that they were in an experiment ( $M=-0.06$ ) did not perform significantly different from the subjects who were led to believe that they were not participating in an experiment ( $M=0.23$ ),  $F(1,177)=2.34$ ,  $p>.05$ . No significant differences were found due to awareness on the percent correct either ( $F<1$ ).

In hypothesis three it was predicted that there would not be a significant interaction between awareness and demand on any measure of performance. There were no significant effects found on the total number correct ( $F < 1$ ) or the percent correct  $F(1,177)=2.18$ ,  $p > .05$ .

Secondary Analyses of Hypotheses. Realizing the flaws inherent in the above analyses due to the ineffectiveness of the awareness manipulation, a secondary analysis on the data of only those subjects for whom the manipulation was effective was undertaken. The performance data of the 75 experimental subjects who reported being aware of their participation and of the 30 no experiment subjects who reported not being aware of their participation were included. This analysis revealed means similar in magnitude and direction to the means reported above. In every case, the F values reported initially as being less than one, remained less than one, and the two F values reported earlier as being greater than one, yet nonsignificant, remained so as well.

## DISCUSSION

In this experiment, two factors potentially mediating the Hawthorne effect, knowledge of being in an experiment and experimental demands on performance, were investigated. The results showed no support for the first prediction that subjects who were told that they were expected to do well, would perform better than subjects who were not told how they were expected to perform. When assessing the effectiveness of the intended manipulation of the experimental demands, it was found that although over all the subjects their expectations of their success was significantly more positive when they were told that they were expected to do well, their expectations were effected differentially across the two "awareness" conditions. This resulted in a significant interaction effect where only the subjects who were not told that they were in an experiment were effected by the manipulation and thus showed a more positive expectation regarding their success. This suggested that the experimental manipulation of demands was not independent of the experimental manipulation of subjects' "awareness". Therefore, this experiment did not provide an adequate assessment of the demand notion.

In the second hypothesis, it was predicted and found that there would be no effect on subjects' performance due to subjects' awareness of their participation in an experiment. However, when examining the effectiveness of the experimental manipulation of the subjects' awareness of their participation, it was found that the manipulation was ineffective in creating subjects who were unaware that they were in an experiment. Over 60% of the subjects in the no experiment conditions reported they were aware of their participation. Although there was a significant effect on subjects' reported awareness due to the intended experimental manipulation, a significant effect was also found due to the manipulation of the experimental demands on performance. However, even when the above analysis was limited to the performance data of only those experiment subjects' who reported that they were not aware of their participation, the results still showed no significant effect. Thus this experiment, as many before it, fails to find any support for the notion of a Hawthorne effect due to subjects' mere awareness of their participation in an experiment.

The major shortcoming of this study is that the intended manipulation of the subjects' knowledge of their participation failed to work as was expected, resulting in a large number of aware subjects in the conditions designed to hide the fact that this was an experiment. If the "no experiment" procedures were not believable because of some pecu-

larity specific to this study, e.g., because the instructors were not present or because a graduate student was running the sessions, the problem could be rectified and the study re-run with increased success. However, if the manipulations intended to lead subjects to think they were not participating in an experiment did not work because of some more generalizable element inherent in the procedures themselves, then any study attempting to assess the effect of the subject's awareness of their participation is susceptible to this difficulty. This may be one factor which has resulted in the experiments reviewed above failing to show a Hawthorne effect.

Another shortcoming of this study is the seemingly unsatisfactory manipulation of the demands on subjects' performance. This may have occurred because the manipulation was perceived by the subjects differently than was expected by the experimenter, and therefore was also reacted to differently by the subjects than was expected. It was assumed that the experiment and no experiment subjects would react positively and similarly to being told that they were expected to perform well on the test. This possibly mistaken assumption made in 1982, quite closely parallels the Hawthorne researchers' assumptions that their actions would be perceived in the intended manner by all of their subjects. It seems that we have not learned much since the 1930's if we keep assuming that we know, rather than assessing what the subject is really thinking.

One interpretation of this differential perception of the demand manipulation may be that being told you are expected to do well, when you have already been told that you are in an experiment, has some type of negative effect on subjects. If a student is told that s/he is expected to do well on a task, they would likely see that as quite normal for the academic setting yet quite unusual for the experimental setting which should be free of obvious biases. This would account for the demand manipulation seeming to have the predicted effect only on the no experiment subjects because the experiment subjects would perceive the demand as unusual and would react differently than was expected. This could also account for the unexpected main effect that demand had on subjects' awareness by decreasing the number of subjects reporting awareness when told they should do well (71%) because such demands are not expected in an experiment, as compared to when subjects were not told how the experimenter expected them to perform (84%). A similar phenomenon was reported by the author in a previous study. Carlopio, Adair, Lindsay, and Spinner (1982) found that when subjects were explicitly told the hypothesis of the experiment, they reacted negatively toward this unusual behavior on the part of the experimenter. These subjects were less likely to believe the explicit hypothesis was the real hypothesis of the experiment as compared to subjects who figured out the hypothesis on their own.

The above interpretations highlight the necessity of assessing what the subjects perceive in an experimental setting as opposed to assuming that we know what they perceive. Orne (1973) believes that the experimenters' perception of the experiment they planned and ran, may be so different at times from the subjects' perceptions of the experiment they participate in, as to cause artifactual interpretations of the subjects' data. Applying this notion to Hawthorne offers an alternative interpretation of the seemingly artifactual effects obtained. The researchers at Hawthorne were trying to combat an expected negative reaction on the part of their subjects by giving them special attention and consideration. However, this special treatment may have been perceived by the workers as an incentive for them to cooperate with the wishes of management and the experimenters. If the subjects perceived the researchers' obvious concern with their performance as management's desire for an increase in worker productivity, they may have been motivated to cooperate with that desire and to try harder. The performance increases obtained would not be related to the experimentally manipulated variables, and the effects would be seen as artifactual from the researchers point of view.

By questioning the subjects in this study, possibly artifactual interpretations of the data may have been avoided. It was unexpectedly found that there were both aware and unaware subjects in the conditions where the experimenter ex-



plicitly told the subjects that they were going to be in an experiment, as well as in the conditions where the subjects were led to believe that they were not in an experiment. Similarly, questioning of the subjects unexpectedly revealed that the demands on subjects' performance had an effect on their awareness, and that subjects' awareness interacted with their perception of the experimental demands on their performance. Since most of the previous studies designed to test the Hawthorne effect have employed similar manipulations, and have failed to assess their subjects' perceptions of them, they may have been plagued by similar problems.

The conclusions that can be drawn from this study regarding the Hawthorne effect, although tentative at best, when considered in light of the review of the literature, seem to point out that although artifacts do exist, mere subjects' awareness of their participation in an experiment is not a sufficient condition to bias results. Therefore, the Hawthorne effect does not seem to warrant the concern researchers give it in terms of control procedures. If one wishes to control artifactual effects in an experiment one must realize that if there are artifactual effects in an experiment, it is more likely because the experimental subjects perceive situational demands differently than the researchers expected them to, than because of some mystical Hawthorne effect. To examine these factors, the experimenter must adequately assess the subjects' perceptions of the 'demands of

the experimental situation. Although this has been proven beneficial in the laboratory setting, (Adair & Schacter, 1972; Spinner, Adair & Barnes, 1977; Carlopio, Adair, Lindsay & Spinner, 1982 in press), it is rarely ever done in lab studies (Gastorf & Suls, 1981) or taught to the next generation of researchers via methodological texts (Adair, Lindsay & Carlopio Note 3). All researchers must become aware of the potential hazards of assuming they know what subjects think and feel about the experiments they participate in. Researchers would be wise to be aware of the potential hazards of their assumptions and the potential benefits that may be derived when the subjects are more appropriately queried.

#### FOOTNOTES

1. Adair (Note 2) has re-labeled the treatments in the Johnson & Foley experiment. He has called their "Placebo", "Experiment", and "Time-Filler" groups, "Experiment-expectancy", "Experiment-no expectancy" and "No-experiment no-expectancy" groups in order to clarify the nature of the treatments within the demand and awareness framework utilized.

#### REFERENCE NOTES

1. Diamond, S.S. Hawthorne effects: Another look. Unpublished Manuscript, University of Illinois at Chicago, 1974.
2. Adair, J.G. The Hawthorne effect: A reinterpretation of the methodological artifact. Paper presented at the Annual Meeting of the Society for the Social Studies of Science, Atlanta, Georgia, November, 1981.
3. Adair, J.G., Lindsay, R.C.L., & Carlopio, J. Social artifact research and ethical regulations: Their impact on the teaching of experimental methods in psychology. Unpublished Manuscript, University of Manitoba, 1982.

## REFERENCES

- Adair, J.G. & Schacter, B.S. To cooperate or to look good?: The subjects' and experimenters' perceptions of each others intentions. Journal of Experimental Social Psychology, 1972, 8, 74-85.
- Carlopio, J., Adair, J.G., Lindsay, R.C.L., & Spinner, B. Avoiding artifact in the search for bias: The importance of assessing subjects' perceptions of the experiment. Journal of Personality and Social Psychology, 1982, in press.
- Cook, D.L. The impact of the Hawthorne effect in experimental designs in educational research. Office of Education, U.S. Department of Health Education and Welfare, Project Number 1757, June, 1967.
- Dignan, M.B. Hawthorne effect in learning by intact classes. Psychological Reports, 1974, 44, 1222.
- Flohr, J.C. A failure to demonstrate the efficacy of the Hawthorne effect in an educational setting. Dissertation Abstracts International, 1977, 37, 7036-7037.
- French, J.R.P. Jr. Field experiments: Changing group productivity, in J.G. Miller (Ed.), Experiments in Social Process, New York: McGraw Hill, 1950.
- Johnson, H.H. & Foley, J.M. Some effects of placebo and experiment conditions in research on methods of teaching. Journal of Educational Psychology, 1969, 60, 6-10.
- Hilgard, E.R., Atkinson, R.L., & Atkinson, R.C. Introduction to psychology (7th. ed.). New York: Harcourt Brace Jovanovich, Inc. 1979.
- Kimble, G.A., Garnezy, N., & Zigler, E. Principles of general psychology (5th. ed.). New York: John Wiley & Sons, Inc. 1980.
- Orne, M.T. Communication by the total experimental situation: Why it is important, how it is evaluated, and its significance for the ecological validity of findings. In P. Pliner, L. Krames, & T. Allaway (Eds.) Communication and affect: Language and thought. New York: Academic Press, 1973, 157-191.

- Page, M.M. On detecting demand awareness by postexperimental questionnaire. Journal of Social Psychology, 1973, 91, 305-323.
- Roethlisberger, F.J. & Dickson, W.J. Management and the worker. Harvard University Press, Cambridge, Mass., 1939.
- Rosen, N.A. & Sales, S.M. Behavior in a nonexperiment: The effects of behavioral field research on the work performance of factory employees. Journal of Applied Psychology, 1966, 50, 165-171.
- Rubeck, P.A. Hawthorne concept--does it affect reading progress? The Reading Teacher, 1975, 28, 375-379.
- Simpson, B.L. An examination of the Hawthorne effect in a verbal learning situation in an educational setting. Dissertation Abstracts International, 1978, 38, 7242-7243.
- Snow, C.E. Research on industrial illumination. A discussion of the relation of illumination intensity to produce efficiency. The Tech Engineering News, 1927, 257-282.
- Spinner, B., Adair, J.G., & Barnes, G.E. A reexamination of the faithful subject role. Journal of Experimental Social Psychology, 1977, 13, 543-551.
- Wool, D. I. The influence of the Hawthorne effect with application to research on institutions for the mentally retarded. Dissertation Abstracts International, 1978, 38, 4743.

## Appendix A

Agenda Discussion Questions for  
Hilgard, Atkinson and Atkinson, Chapter 17  
Social Psychology

1. What is bystander intervention? How do others effect the likelihood of our intervening in an emergency?
2. What is cognitive dissonance theory and how is it supposed to work?
3. What is the concept of identification? How does identification effect our attitudes?
4. What are primacy and recency effects? How do they effect us?
5. What are some of the factors influencing our attraction to others?
6. What are some of the rules and concepts of the attribution process?



Test for Chapter 17, Hilgard, Atkinson and Atkinson

1. In an emergency situation, the presence of other bystanders serves to
  - a. embolden the individual to act
  - b. diminish the individual's fear of involvement
  - b. diffuse the responsibility for acting
  - d. define the situation as an emergency
2. According to Festinger's theory of cognitive dissonance, when we engage in behavior we do not believe in, there is pressure to
  - a. dismiss the behavior as an aberration
  - b. experience guilt feelings
  - c. alter the belief
  - d. change reference groups
3. If your sorority or fraternity is one of your reference groups, how will this group affect you?
  - a. You will evaluate your beliefs and behavior by comparison with other members
  - b. Your behavior will be regulated by the members' use of social reward and punishment
  - c. It will influence your interpretation of events and social issues
  - d. All of the above are true
4. The primacy effect in impression formation is when we are most influenced by the
  - a. first information we receive about the person
  - b. last information we receive about the person
  - c. physical attractiveness of the person
  - d. dispositional characteristics of the person
5. When couples were computer matched at a dance and then asked to rate each other at intermission, the factor that correlated highest with the rating was the date's
  - a. intelligence
  - b. sense of humor
  - c. dancing ability
  - d. physical attractiveness
6. If we infer that something unique about a person is primarily responsible for a particular observed behavior, the inference is called
  - a. internalization
  - b. a situational attribution
  - c. the primary effect
  - d. a dispositional attribution

7. In one study, an experimenter appeared to be ill and collapsed on a New York City subway. The setting minimized pluralistic ignorance and diffusion of responsibility. What happened?
  - a. Generally, no one assisted the "ill victim."
  - b. In general, the "victim" received spontaneous help.
  - c. Intervention depended on the race of the "victim."
  - d. People helped the "victim" with the cane, but not the "drunk."
8. According to Festinger's cognitive dissonance theory, when our behavior is not in agreement with our beliefs, we will change our belief if
  - a. the belief is not strongly held
  - b. we can find a rational reason for the behavior
  - c. there is no compelling reason for the behavior
  - d. the belief was originally based on identification
9. Attitudes initially based on identification
  - a. very rarely become internalized
  - b. are generally discarded quickly
  - c. occur almost exclusively in young people
  - d. probably account for most of our views
10. If you hear conflicting descriptions of an individual, one before and one after an irrelevant task, you are likely to give
  - a. more weight to the first description
  - b. more weight to the later description
  - c. equal weight to the two descriptions
  - d. more weight to the first description if the task was dull
11. Studies of interpersonal attraction have found that we tend to like those people who
  - a. ignore us at first
  - b. are less capable than we are
  - c. like us
  - d. are neutral to us
12. When we attempt to interpret human behavior, we look to see whether certain effects tend to go with certain suspected causes. This is referred to as
  - a. applying the covariance rule
  - b. evidence of primacy effects
  - c. social perception
  - d. emphasizing the individual's phenomenology

13. If one person came forward to help a person in distress, experiments show we can expect
- a. no one else to follow because the responsibility has already been assumed by someone
  - b. no one else to follow because others will define the situation as a nonemergency
  - c. at present we tend to assume less responsibility for action
  - d. all of the above
14. According to Festinger's cognitive dissonance theory, the best way to get a person to change his or her belief is to
- a. present the opposing view in a strong form
  - b. present his or her own view in a weak form
  - c. get him or her to present the opposing view for a small fee
  - d. get him or her to present the opposing view for a large fee
15. Reference groups generally do NOT
- a. provide us with an interpretation of social events
  - b. cease to exert an influence on us after college
  - c. regulate their members through the use of social reward and punishment
  - d. conflict with other reference groups
16. If a movie review begins with favorable comments about a film but ends on a generally negative note, the reader's overall impression of the film will probably be
- a. favorable
  - b. unfavorable
  - c. ambivalent
  - d. unpredictable
17. In Newcomb's study on the pairing of similar and dissimilar roommates, the overriding factor that determined their liking for each other was
- a. similarity
  - b. familiarity
  - c. identification
  - d. cognitive dissonance
18. If one of your friends recommends a book that all of your other friends disliked, you might conclude that the book is not worth reading by using the criterion of
- a. consistency
  - b. consensus
  - c. discounting
  - d. distinctiveness

Agenda Discussion Questions for  
Kimble, Garmezy and Zigler Chapter 19,  
Treatment and Therapy of Disordered States

1. What is electroconvulsive shock therapy and what are its effects?
2. Drugs have been and are currently used to treat mental disorders. Which disorders have been found to be effectively treated by which drugs?
3. The form of psychotherapy founded by Freud is called psychoanalysis. What are the major principles, terms and aims of Freudian psychoanalysis?
4. What is non-directive (or client-centered) therapy? What are its assumptions, characteristics and contributions?
5. The principles of classical and operent conditioning form the roots of a type of psychotherapy known as behavior therapy. Systematic desensitization is a type of behavior therapy. What principle is systematic desensitization based on and which disorders are most effectively treated by it?
6. Another type of behavior therapy is called aversion therapy. What is aversion therapy, how does it work and what are the different types of aversion therapy?

Test for Chapter 19, Kimble, Garnezy and Zigler

1. The method of treatment introduced by Cerletti and Bini that involves passing low amperage current through the patient's head for a few seconds is referred to as:
  - a. LSD treatment
  - b. EEG therapy
  - c. ESP therapy
  - d. ECT
2. The drug referred to as a landmark in psychopharmacology that is very effective in controlling mania is called:
  - a. lithium
  - b. tardive
  - c. LSD
  - d. chlorpromazine
3. One of the keystones of psychoanalysis, in which the subject talks about everything that comes to mind no matter how seemingly trivial, irrelevant, senseless, embarrassing, or vulgar, is called:
  - a. free association
  - b. transference
  - c. abreaction
  - d. resistance
4. Which of the following is not characteristic of client-centered or nondirective therapy?
  - a. The stress is on the process of reeducation.
  - b. The responsibility for working a problem through is largely the client's.
  - c. It is most often used with moderate to profound maladjustments.
  - d. The role of the counselor is that of accepting, restating, and clarifying the client's statements.
5. Systematic desensitization is used to eliminate or reduce:
  - a. delusions
  - b. hallucinations
  - c. phobias
  - d. obsessions
6. Which of the following is not a type of aversion therapy?
  - a. classical conditioning
  - b. electroconvulsive shock
  - c. punishment
  - d. avoidance training

7. One side-effect of electroconvulsive shock therapy (ECT) is that it usually leads to:
  - a. tarditive dyskinesia
  - b. retrograde amnesia
  - c. reciprocal nemosis
  - d. abreaction
8. The most effective use of the tranquilizing drugs has been with:
  - a. phobics
  - b. psychotics
  - c. schizophrenics
  - d. victims of somatic disorders
9. When a patient's attitudes towards the psychoanalyst change from warmth and rapport to anger and derogation, the shift is called:
  - a. positive transference
  - b. resistance
  - c. negative transference
  - d. repression
10. Which of the following statements is true of the behavior or role of the therapist in nondirective therapy?
  - a. Techniques such as dream interpretation and free association are commonly employed by the nondirective counselor.
  - b. The therapist tries to interpret the client's behavior to promote insight.
  - c. The nondirective therapist sees no necessity to have a diagnosis prior to treatment.
  - d. There is an attempt by the therapist, through advice, praise, or blame, to cajole the client into self-insight.
11. As a therapeutic method, systematic desensitization is based on:
  - a. avoidance training
  - b. the transference nemosis principle
  - c. the principle of reciprocal inhibition
  - d. paradoxical inhibition conditioning
12. When a noxious stimulus is paired with a stimulus that elicits the maladaptive behavior, the aversive therapy being used is:
  - a. classical conditioning
  - b. negative transference
  - c. punishment
  - d. avoidance training

13. Electroshock appears to have its greatest positive effect with:
- a. mild, long-term depressions
  - b. chronic depression associated with the personality disorders
  - c. severely depressed patients
  - d. younger patients
14. Tardive dyskinesia, marked by tic-like involuntary movements of the face, mouth, shoulder, and arm, is caused by prolonged usage of:
- a. electroconvulsive shock
  - b. phenothiazine compounds
  - c. placebos
  - d. lithium
15. To make unconscious conflicts conscious and thus bring irrational neurotic behavior under rational and constructive control is the fundamental aim of:
- a. psychoanalysis
  - b. client-centered therapy
  - c. behavior therapy
  - d. social-learning therapy
16. The demonstration that the therapeutic process is amenable to research has been a major contribution of:
- a. psychoanalysis
  - b. nondirective therapy
  - c. milieu therapy
  - d. social-learning therapy
17. In the presence of anxiety-evoking stimuli, to provide a means whereby a response antagonistic to anxiety can be made (so that the anxiety response is suppressed, resulting in a weakening of the bond between these stimuli and the anxiety responses they have produced in the past) is the main thrust behind:
- a. implosion therapy
  - b. the principle of reciprocal inhibition
  - c. transfer nemoisis
  - d. aversion therapy
18. In avoidance training:
- a. a noxious stimulus is paired with a stimulus that elicits the maladaptive behavior
  - b. the behavior is followed by the noxious stimulus
  - c. the punishment is not administered if the individual does not engage in the maladaptive behavior
  - d. the behavior is preceded by the noxious stimulus

12. Do you think that the students chosen to leave the classroom to participate in an experiment were chosen for any special reason?

yes      no      If yes, what reason?

13. Do you think the students chosen to leave the class were lucky to be out of class?

yes      no

14. This was an experiment. In every experiment like this, the experimenter expects certain results.  
How did you think the experimenter expected you to respond on the multiple choice test?

\_\_\_\_\_ Do well

\_\_\_\_\_ Do poorly

\_\_\_\_\_ Do the best I could



### Evaluation Form

1. Had you read any part of the chapter you discussed today prior to attending class?  
Yes      No      If yes, how much?
2. How many of the agenda items did your group discuss? \_\_\_\_\_
3. For those questions discussed by your group, how complete or thorough was your discussion?  
very limited      1      2      3      4      5      very complete
4. Why do you think I gave you the multiple choice test on the material you discussed from the chapter?
5. How much did you expect you would learn using the agenda discussion technique as compared to reading the chapter alone?  
would learn alot more using      1      2      3      4      5      would learn alot less  
the discussion technique      using the discussion  
technique
6. How enjoyable did you find the agenda discussion technique to be?  
very enjoyable      1      2      3      4      5
7. How hard did you try to learn the chapter material during the discussion period?  
very hard      1      2      3      4      5      not hard at all
8. Would you like to use the agenda discussion technique again?  
1      2      3      4  
Yes frequently      Yes once in a while      yes but not frequently      No never  
again
9. What do you think was the purpose of having you do the agenda discussion exercise today?
10. Before you started this questionnaire, did you think that you were participating in an experiment?      yes      no  
How sure were you?      very sure      1      2      3      4      5      not sure

## Procedural Instructions

When you get the questions please discuss the first one making sure that both you and your partner understand the correct answer and then go on to the next question. Follow the same procedure for each of the agenda questions. Use your book as much as you want. Be sure to take each question in order and do not skip any. You will have a half hour to cover as many questions as you can. Try to cover them all. After the half hour is up you will get a brief multiple choice test on the material covered on the agenda. This test will not count toward your grade.

## Experiment Positive Expectancy

I have taken you out of your class today to participate in an experiment. I have been working with the CAUT committee on college teaching in trying to improve the teaching of several subjects, including psychology. I would like you to divide into groups of two (or three?) and I will give you a series of questions to discuss on chapter XX of your textbook. Today you will be using the agenda discussion technique. The agenda discussion technique is a very effective method of teaching which usually produces excellent results. It has been found that students in several universities learned a great deal using this discussion method. You should learn quite a bit today and do well on the end of the period test.

## No Experiment Positive Expectancy

You will not be participating in the experiment. Your instructor would like you to do a discussion exercise on the chapter in your text which would have been covered if you had a lecture this class period. After I give you your initial instructions, my assistant, your TA will stay and supervise when I leave to go run my experiment. I would like you to divide into groups of two (or three?) and I will give you a series of questions to discuss on chapter XX of your textbook. Today you will be using what is called the agenda discussion technique. The agenda discussion technique is a very effective method of teaching which usually produces excellent results. It has been found that students in several universities learned a great deal using this discussion method. You should learn quite a bit today and do well on the end of period test.

## Experiment No Expectancy

I have taken you out of your class today to participate in an experiment. I have been working with the CAUT committee on college teaching in trying to improve the teaching of several subjects, including psychology. I would like you to divide into groups of two (or three?) and I will give you a series of questions to discuss on chapter XX of your textbook. Today you will be using the agenda discussion technique.

## No Experiment No Expectancy

Although you will not be participating in the experiment, your instructor would like you to do a discussion exercise on the chapter in your text which would have been covered if you had a lecture this class period. After I give you your initial instructions, my assistant, your TA, will stay and supervise when I leave to go run my experiment. I would like you to divide into groups of two (or three?) and I will give you a series of questions to discuss on chapter XX of your textbook. Today you will be using what is called agenda discussion technique.