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A PILOT STUDY

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

by
Myrna Anne Yeakle, B.S., M.S.P.H.

The Ohio State University
1975

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CHAPTER I

INTRODUCTION

The use of play and games as educational tools has received increased attention in the last decade. There are multitudes of claims made for the learning that is accomplished through various types of games. One of those claims is that educational games afford the participants an opportunity for involvement in a life-like experience in such a manner as to become familiar with the potential results of certain kinds of behavior without having to cope with the long-term consequences of his or her actions. This kind of organized experience is usually referred to as a simulation game.

It is this potential in the use of educational games which appears to hold promise for Health Education. This discipline has been concerned with the identification of teaching-learning methodologies which may be appropriate in impressing the student with both the long-term and short-term impact of certain types of health behavior. Heretofore, attempts in this direction have included the use of fear and the emphasis of the desirability of particular practices with or without a suitable rationale for them. Although these techniques are not entirely ineffective when used
judiciously, they have not always produced the long lasting effect which is sought. If educational games can produce desired influences on future behavior, they may prove to be a valuable tool to be added to the repertoire of methods available to the Health Educator.

The simulation game is only one type of educational game. Unlike simulation games, the non-simulation games do not attempt to reproduce an element of the real world, but rather, are somewhat more structured and generally limited in the concepts with which they deal. A non-simulation game may be a part of a broader simulation game. Where simulation games tend to emphasize concepts of broad issues such as effects of certain social interactions, or principles of the evolution of a community, non-simulation games are more specifically directed and generally involve development of the less complex levels of cognition.

The literature on gaming reflects a high degree of enthusiasm for the use of games for learning, however, the research on games has produced mixed results. Further, the validity of the research has been viewed with some skepticism. This is particularly true of that conducted with simulation games. Those who have employed simulation games in the classroom are nearly unanimous in their acknowledgement that something very exciting transpires and that the experience probably facilitates learning. The nature of the gains made by the students is not so clearly agreed upon.

It has been argued that the simulation game cannot be
effectively researched until the learning outcomes are more distinctly defined. In addition, since it has been presumed that the learning outcomes are different from those of more traditional experiences, there appears to be a gross limitation with regard to the instruments currently available for evaluating these different results of the simulation game technique. For these reasons, the more structured non-simulation game was selected for this research project. It is presumed that with the expanded use of a variety of forms of gaming, some of the major questions which still remain will commence to be answered and the pieces of the puzzle will eventually fall into place.

The non-simulation games have not been researched as frequently as the simulation games. However, the limited research does not seem to be an indicator of the potential significance of such learning exercises. Twelker and Layden, in comparing non-simulation games and simulation games, have identified some significant characteristics of non-simulation games as learning tools. Among these characteristics are that they are easily adaptable; they rely little on teacher-direction; there is a high degree of peer interaction; they accommodate heterogeneous groups; they provide for peer feedback; and they are easily inserted into the curriculum. With regard to cognitive learning outcomes, non-simulation games are most effective in developing the lower level cognitive functions, e.g., the learning of facts, concepts and principles, whereas, simulation games are strong in
developing skills in application, synthesis and evaluation. The affective values of non-simulation games include a high degree of personal involvement in the learning process, and a great deal of impact on the motivation to participate and on the attitudes of the students toward the subject matter as well as toward the instructor. Such potential benefits and values are impressive, but it should be noted that similar strengths are claimed for simulation games as well. Non-simulation games, however, have some aspects which make them more desirable in some respects than the simulation game. In addition to the administrative issues mentioned previously (ease of adaptation, suitability for heterogeneous groups, etc.), there is another important factor and that involves getting the game into the classroom. Non-simulation games have a decided practical advantage over simulation games in two primary respects. First, non-simulation games are generally less complex and, therefore, require less preparation on the part of the teacher and less classroom time for play. Realistically, it is recognized that the curriculum is crowded and instructional time is at a premium. As a result, a non-simulation game may be more readily accepted. In addition, and perhaps even more significant, is the fact

that commercially-prepared non-simulation games tend to be less expensive than their counterparts.

The review of the literature has revealed that little is known about the effectiveness of learning games as implements in the educational process. It is also clear that the research that has been conducted leaves some gaps in terms of questions asked and answered, methodologies used and developed, instruments developed, and subject matters researched. The quantity of research on gaming is limited and it becomes even more so where non-simulation games are concerned. Most of the games research has been conducted within the social studies and in business education curricula in schools and colleges. There is no indication of gaming having been studied as a method of teaching in Health Education, and though it may not be necessary for each new methodology to have to prove itself for each component of the curriculum, there seems to be value in conducting games research in this discipline. On the one hand, Health Education is somewhat unique from some other disciplines in that the focal point of learning is based on behaviors which in many cases will not be applicable for several years to come or for which the motivation for action is weak because the potential impact of appropriate behavior or misbehavior lies in a distant future. Secondly, since the curricular disciplines tend to be effectively insulated from each other with separate professional organizations and publications, introduction of new teaching methodologies in each discipline may
be facilitated by the reporting of discipline-related research in the appropriate publications. It is with these broad concerns that this study is being undertaken.

The non-simulation game selected for this study is The Propaganda Game, (in the future referred to as Propaganda) created by Robert W. Allen and Lorne Greene and based on the book Thinking Straighter by George Henry Moulds. Mr. Allen has had extensive experience with the design and implementation of academic games including participation in the development of Wff' N Proof and Equations (games designed to develop skills in logic and in mathematics). He served as Director of the Academic Games Project at the Nova Schools in Fort Lauderdale, Florida. Mr. Greene is more readily recognized as a performer in the theater and television. The late Dr. Moulds was a professor of philosophy at Kent State University. Propaganda is designed to help its participants recognize and label various techniques of persuasion which may be used in argumentation and/or in advertising of products.

PURPOSE OF THE STUDY

The purpose of this study is to examine the effectiveness of the game Propaganda as a tool for teaching selected

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persuasion techniques termed "techniques of irrelevance" which may be employed in the advertising of health products or services. The "techniques of irrelevance" are those persuasion techniques which may influence one's decision to purchase something but which are not pertinent to judging the product or service itself.

The absence of reported research with non-simulation games in Health Education, the limited research conducted with Propaganda, and absence of statistical support for the test instruments to be used in this study are all factors which led to the determination that this should be a pilot study. The findings of the study may be useful in further research efforts with the non-simulation game, Propaganda, and the appearance of research on educational gaming in Health Education may promote more research and stimulate the design and use of educational games specifically created for the goals and objectives of the discipline.

The sub-purposes of the proposed research are:

1. To initiate the development of a valid and reliable test comprised of advertisements for health products which reflect the "techniques of irrelevance" used in the game Propaganda.

2. To initiate an assessment of the validity and the reliability of the test instrument used as the pretest and the first posttest.

3. To compare the learning that occurs as a result
of the use of certain instructional elements common to the primary research groups:

a. To assess the impact of the pretest experience on performance on Posttest II.

b. To assess the impact of the Techniques Sheet on performance on Posttest I and Posttest II.

The purpose for this study leads to the following hypotheses. It is hypothesized that:

1. Students who play the "techniques of irrelevance" section of the game Propaganda will be more accurate in labeling selected examples of these techniques than those who learn the advertising techniques by a non-game instructional method as determined by the mean scores on Posttest I.

2. Students who adapt the "techniques of irrelevance" section of the game Propaganda by providing health-related examples will be more accurate in their identification of the techniques used in the advertising of health products than those who only play the game and those who do not participate in the gaming experience as determined by the scores on Posttest I.

3. Those subjects who were involved in the adaptation of the "techniques of irrelevance" section of the game Propaganda will exhibit greater long-term retention than those who only play the game and those who do not participate in the gaming experience.
DESIGN AND PROCEDURES

The research project will take place within one academic term with fifty school days elapsing from start to finish. There will be three primary research groups (Experimental I, Experimental II, and Control I) which will serve to produce the results which will determine if the hypotheses can be verified. The two remaining groups (Control II and Control III) will be used to assess the learning influence of two of the elements (the Pretest and the Techniques Sheet) common to all of the primary research groups. Figure 1.1 is a summary of the overall research design and indicates the research events involving each group participating in the study.

The activities of each of the research groups are summarized as follows:

1. Experimental I will play the game Propaganda and then adapt it from the original examples of the "techniques of irrelevance" to new examples, of the subjects' own design, which reflect advertising of health-related products or services.

2. Experimental II will play the game in its original form with no attempts at adaptation.

3. Control I will receive instruction on the "techniques of irrelevance" through the inquiry method.

4. Control II will receive no instruction on the "techniques of irrelevance."
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Figure 1.1

Summary of Research Design
5. Control III will be given the Techniques Sheet and instructed to read it.

The data from Experimental I and Experimental II should reveal if there is any value in the adapting procedure or if sufficient learning occurs by simply playing the unaltered game. Comparison of the results from the two experimental groups with Control I should indicate the effectiveness of the game in relation to another instructional method. The Control II and Control III groups are designed to determine the effects of the common elements used in the Experimental I and II and Control I groups. Control II will show the learning effects of the pretest itself. The impact of the Techniques Sheet will be indicated by Control III.

INSTRUMENTS, SUBJECTS, FACULTY

The success of this research project will be dependent on sound assessment instruments, and the cooperation of the subjects and the faculty.

The Instruments

The assessment instruments to be used in this study are as follows:

1. Pretest - The Pretest is composed of test items prepared by George Henry Moulds for the Academic Games Olympics. The Pretest will be used to help determine the comparability of the five groups involved in the research
and to help determine the amount of change following the administration of the various research treatments.

2. Posttest I - This first posttest is the same instrument as the Pretest. It will be administered at the conclusion of the various group treatments. Its purpose is to help ascertain how much improvement in the ability to identify the "techniques of irrelevance" occurs following the various learning experiences. In addition, the results of Posttest I will be compared with the results of Posttest II to help determine the amount of retention in each appropriate research group.

3. Posttest II - This test consists of the content of selected advertisements for health-related products. Each item in the test reflects one of the "techniques of irrelevance" to which the subjects will have been exposed. It will be used following an interval of nine weeks after the first posttest to help determine the retention of knowledge of the "techniques of irrelevance."

One non-assessment instrument will also be employed. This is a document called the Techniques Sheet which will be distributed to all participants except Control II. The Techniques Sheet presents an example with an explanation of each of the "techniques of irrelevance."

The Subjects

The students who will participate in this project will be those who are enrolled in the introductory personal health course at the Eastern Michigan University. This is a
three-credit hour course dealing with a variety of personal health issues including consumer health. The total number of participants will be 224. Though the course is at the freshman level, students from all class levels enroll. In addition, it is a requirement for persons whose academic majors are in Physical Education or Recreation, however, these will represent only about forty percent of the total course enrollment.

The Participating Faculty

Five faculty members will participate in the research project. Each is assigned to one or more sections of the course from which the subjects come. The faculty members will be briefed regarding the nature of the project and their specific responsibilities. All instructions regarding the tests, surveys, and game play will be given in writing to the appropriate instructors. Following the administration of the first posttest, the instructors will participate in a debriefing session in which their perceptions and observations pertinent to the project will be voiced. It should be noted that where possible, no instructor will be responsible for more than one type of research group, i.e., no one will be administering two different treatments. The single exception is where the instructor who presents the Experimental II treatment will also be responsible for the Control III group.
TREATMENT OF THE DATA

Test Validity and Reliability

The quality of the tests used in the research is important. In initiating the development of respectable assessment instruments, efforts will be made to establish direct validity and to determine the statistical reliability of the tests used in the study.

Pretest

If the classes participating in the research are randomly grouped, then there should be no significant differences among them. In order to be certain differences do not exist, a one-way analysis of variance will be computed and if a significant F-ratio is obtained, a post hoc comparison will be made to determine where the difference(s) are.

Pretest/Posttest I

The essential questions are:

1. Is there a change in the test performance?
2. Do certain groups reflect greater change than do others?

An analysis of variance will be used to provide the answers to these questions.

Posttest I/Posttest II

The purpose of Posttest II will be to provide some indication of retention of the information presented in the learning experiences. There will be a nine week time lapse
between Posttest I and Posttest II. To identify the extent of retention, a t-test will be used between the two tests by group. An analysis of variance will be employed to determine the significance of any differences which may exist among the groups.

DEFINITION OF TERMS

For the purposes of this study, the following definitions of terms will be used.

Non-simulation game. A non-simulation game is a competitive learning environment created by players attempting to achieve externally determined goals. (Also referred to as a learning game.) Non-simulation games are characterized by an absence of an effort to simulate a social system or some selected aspect of reality. Commercial games which may be classified as non-simulation include Wff 'N Proof, Equations and Propaganda.

Inquiry method. "Inquiry is a method of learning which stresses self-discovery through identifying a problem, gathering information relating to it, analyzing the data, and arriving at a defensible conclusion... The inquiry approach is less structured than most other learning methods, employs multisensory techniques, and encourages independent and creative thinking."\(^3\)

---

**Novel method.** An instructional method which is not frequently employed and with which college students are not generally familiar.

**Gaming.** Refers to the use of games for instructional purposes.

**Learning game.** See non-simulation game.

**Primary research groups.** The Experimental I, Experimental II, and Control I groups which are involved in verifying the research hypotheses.

**Persuasion techniques.** Methods employed in presenting arguments designed to influence the thinking and action of others.

**Techniques of irrelevance.** These are comprised of nine different persuasion techniques which represent issues not generally pertinent to the decision-making process. For example, an individual may select a physician on the basis of the number of degrees held despite the fact that most (or all) of the degrees may be irrelevant to the person's ability to practice medicine. The nine "techniques of irrelevance" presented in the game Propaganda include:

1. Appearance
2. Manner
3. Degrees and Titles
4. Numbers
5. Status
6. Repetition
7. Slogans
9. Technical Jargon
9. Sophistical Formula

Techniques sheet. A document describing the "techniques of irrelevance" used in the research.

LIMITATIONS OF THE STUDY

1. With five different instructors participating in the study, it will not be possible to control for the differences in personality, enthusiasm, and competence.

2. The numbers of students in the various groups may not be equal because of the popularity of certain class hours or instructors.

3. The assessment instruments employed are either untested or have no data available regarding their reliability.
CHAPTER II

REVIEW OF THE LITERATURE

There is a growing body of literature dealing with the role of play and games in human development and in social education and interaction. These writings run the gamut of theories from play and games as crucial to normal socialization and personality development of the young to the psychological games people play in daily social intercourse. One area of particular value to the background of the concept of educational gaming relates to the broad use of play and games as a social development phenomenon. Several authors (e.g. Huizinga; Piaget; Caplan and Caplan) make reference to the significance of play as an important force in the socialization and culturation of each succeeding generation. Others (e.g. Coleman; McLuhan; and Long) identify games as models of culture and social life. Still others contend that games allow persons to act out conflicts in socially acceptable ways (e.g. Rapaport). The significance of these views relative to educational gaming is that they point out that play and games can be serious and functional factors in human development. Since formal education is concerned with human development, it would appear that play and games may indeed offer a valuable resource in meeting its goals.
A review of the literature on the use of games for formal educational purposes is a formidable task despite the fact that the profusion of writings did not begin to appear until the mid 1960's. The literature on educational games as instructional tools has four notable characteristics: (1) it is profuse; (2) it is inconsistent in its conclusions (i.e., there is not agreement on the issues); (3) it is most often based on limited experience with gaming (with support coming from empirical evidence rather than experimental research evidence); and (4) it is almost exclusively limited to simulation games (as opposed to non-simulation games).

As with other innovations in education, the initial reactions are often characterized by an exuberance which is subsequently tempered by the realization that no single tool or procedure can solve the problems of providing for effective learning. However, as the repertoire of teaching-learning tools is expanded, educators have at their disposal a greater variety of approaches which can be utilized to meet specific kinds of educational needs. Educational games represent one of those implements and though the idea of using games for learning is not new, it may be that it is an idea for which the time for serious consideration has come.

In order that this chapter may present a comprehensive overview of the literature related to educational gaming, it will include information ranging from the views
of educational theorists to the descriptions of experimental research studies which have been directed toward assessment of the values of instructional games. An overview of this review follows:

1. Educational theory as a foundation for including gaming as a part of the repertoire of educational methods.

2. History and future of the use of games for instructional purposes.

3. The values of educational games.


6. Completed research on educational games.

7. Future needs for research on educational games.

Since the bulk of the literature is aimed toward simulation games rather than non-simulation games and since these writings are often based on empirical rather than experimental evidence, an attempt has been made to de-emphasize a significant portion of that which is written about educational games. On the other hand, the section which presents a review of the experimental research on these games will be heavily weighted toward simulation games since that is where the research has been focused.
EDUCATIONAL THEORY AS A FOUNDATION FOR EDUCATIONAL GAMING

This brief review of educational theory is included for the purpose of demonstrating that the basis for the use of games for instructional purposes has been present in the thinking of some of the most notable personalities in the field. The views do not necessarily specify gaming as a desirable method, but rather, support methodologies which accomplish certain tasks. It so happens that some of these tasks are represented in the known or hypothesized learning outcomes of some of the various kinds of educational games.

Some of the criticisms of contemporary education provide insight into the kinds of changes which will be necessary if education is to better meet the existing and future needs of society. Many critics of today's educational system perceive it as generally irrelevant in relation to the kind of society it now serves, and envision it as being particularly incapable of profiting those who will live a good portion of their lives in a not clearly definable yet surely to be a rapidly and dramatically changing 21st century.

Some Criticisms of Contemporary Education and Some Ideas of How Gaming May Relate to Them

In noting the views of the theorists, it is beneficial to include not only their perceptions of what should be but also their criticisms of the contemporary educational
efforts. Some of these criticisms which are particularly relevant to academic gaming are briefly summarized here.

1. The structure and processes employed in today's education were developed for a time in history which no longer exists. The structuring and routine does not reflect the needs of the emerging social structure.¹

2. Contemporary adolescents are discontented with the absence of excitement and of freedom to try out their own ideas and with the presence of the prescriptive nature of the school.²

3. There is less status afforded the scholar than that afforded the athlete. Status among peers is an important aspect of the adolescent's needs. The schools should seek ways of capturing the desire for status through competitive academic programs.³

4. Formal education has neither developed curricula which meet the needs nor has it developed methodologies which lead to the most effective learning. Reason for action (motivation) is not actively pursued by educators.⁴


⁴Abt, op. cit., p. 15.
5. Concerning preparation for the future, the schools have not recognized the needs of the present. What is done in the schools lacks meaning in relation to the present experiences of the child and thus is not really educative.\(^5\)

Academic games should not be perceived as a panacea for these problems of education; but, if the claims for them withstand the scrutiny of experimental research, they may make a contribution to the improvement of the educational process.

The first two criticisms mentioned above are significant in relation to educational gaming in that this methodology is purported to be less structured and to provide for greater student responsibility in the learning process. Further, games offer the opportunity for excitement and (especially in simulation games) a chance to try ideas out and experience some of the impact of specific actions. Because participants in games can try out ideas and experience consequences of behavior, gaming may enhance student motivation. Finally, simulation games in particular offer the participants to create situations of the future and to "experience" them so that they become more real and meaningful.

Educational Theorists Views

Following is a brief summary of selected educational theorists views significant to the support of academic gaming.

(1) Education is to teach men to live.®
(2) Children begin to understand when they see what they are learning applied and can apply it themselves. 7
(3) Learning should be fun. 8
(4) Motivation to learn precedes effective learning. 9
(5) In building self-confidence in the child, it is important that he can experience some control over his world. 10
(6) Education for the future requires that the learning be in some way meaningful in the present. 11
(7) A desirable learning environment must provide the learner with the opportunity to take action, make

8Caplan and Caplan, op. cit., p. 262.
9Ibid., p. 263.
11Coleman, Adolescents and the Schools, p. 109.
mistakes, experience the consequences of those mistakes, and make it most difficult to survive without learning.\(^{12}\)

\(8\) There must be excitement in the discovery of knowledge and understandings.\(^{13}\)

These statements are compatible with some of the claims that are made for educational games.

**THE HISTORY AND FUTURE OF EDUCATIONAL GAMING**

The information presented thus far represents some philosophical bases upon which the concept of educational gaming is founded. The use of games for the purpose of learning is not a recent innovation though their use in schools is relatively new. War games are the oldest form of the use of the gaming technique in education. Chess, initially used as a war game, is estimated to be over 1,500 years old. War games have been used for centuries. They saw extensive use by Germany and Japan in World War II.\(^{14}\)

In 1956, the American Management Association adapted the idea of war gaming to business and produced the first business

\(^{12}\)Ibid., p. 108.


The social sciences followed with the development of numerous games designed to simulate social systems. These were and are used for both instruction and for research.

In education, simulations were employed before games. The project known as the Jefferson Township School District was the first published work on simulation in education. To date, the bulk of gaming and simulation in education is found in the areas of teacher preparation and in the social studies.

Boocock and Schild offer a brief history of simulation games for classroom use. They identify three somewhat distinct phases:

**Phase 1: acceptance on faith.** During this phase, which lasted until 1962, or 1963, social scientists 'discovered' gaming as a technique for the classroom, and several games were developed and field tested. It was a time of great and diffuse enthusiasm for a technique, without much concern with collecting "hard" evidence to support the enthusiasm... The lack of rigorous research at this stage is not really surprising. Because the field was new and small, most researchers were concentrating upon designing games rather than evaluating them. Second, lack of adequate experimentation is a characteristic of educational research generally. Finally, game sessions are so exciting to observe that the interest and involvement of players were often accepted as evidence of learning.

**Phase 2: post-honeymoon.** During the years 1963-1965, some researchers attempted controlled experiments with games. Generally inconclusive (or even negative) results led them


16 Ibid., p. 9.
to rather sobering conclusions: (a) that games are not a panacea for all educational ills; (b) that the games in their present form have serious flaws; and (c) that neither standard tests nor the relatively crude instruments designed specifically to evaluate a particular game or games are adequate or sufficient measures for the impact of games.

Phase 3: realistic optimism. During the past year or two (1966-1968) the trend has been toward renewed (albeit more tempered) optimism, based upon accumulated experience with a number of games. This phase is characterized by progress on three fronts:

(a) field testing of a number of different simulation games in a wide variety of educational settings; . . .

(b) accumulation of a pool of data on the learning effects of specific games; . . .

(c) revision and clarification of 'theory' or claims concerning what games can do in the classroom.17

There are several factors which make the time right for the growth of educational gaming in the schools. In general, there is increasing teacher dissatisfaction with the traditional methodological approaches.18 As educators become more concerned with the development of decision-making skills, the often used instructional methods are not always suitable for such skill training. In addition, there are other aspects of renewed educational objectives such as social development, development of self-confidence and


understanding, which may be served well by the gaming tech-
nique. The trend toward concept-oriented curricula is
another factor. Some proponents of educational gaming
suggest that the process may enhance concept development.\(^\text{19}\)
Abt sees games as contributing to the solution of some of
the schools' problems through increasing curricular rele-
vance. Retention is enhanced by opportunity to apply newly
developed skills under somewhat realistic conditions.\(^\text{20}\)
There is some evidence that the academically unsuccessful
(the underachiever, the non-motivated, the culturally de-
prived) respond particularly well to educational games.\(^\text{21}\)

The future of games in the classroom is obviously
difficult to predict and if they are to survive, there will
be problems (e.g. dissemination, high cost, quality games,
teacher training) to be overcome. Abt is optimistic. He
states,

The growing trend toward increased game use in
the classroom is likely to continue into the

\(^{19}\)Jerome S. Bruner, Toward A Theory of Instruction,
\(^{20}\)Abt, op. cit., pp. 120, 123.
\(^{21}\)Sarane S. Boocock and E. O. Schild, "The Future of
Simulation Games," Simulation Games in Learning, eds. Sarane
S. Boocock and E. O. Schild (Beverly Hills: Sage Publica-
Effect of Ability, Achievement, and Number of Plays on
Learning From a Simulation Game," Report No. 115, (Baltimore:
Center for the Social Organization of Schools, Johns Hop-
kins University, September, 1971), pp. 2-3. Dale C. Farran,
"Competition and Learning for Underachievers," Simulation
Games in Learning, eds. Sarane S. Boocock and E. O. Schild
future as schools seek additional ways to make
learning active, relevant, and exciting for
students and teachers and to lower the barriers
which often make school 'foreign' to young
students.22

VALUES OF EDUCATIONAL GAMES

This section presents the views of a number of per­sons experienced in the use of games for educational pur­poses. These perceptions are not necessarily supported by research evidence. Further, they are generalized and do not always apply to a specific type of game. Some of the values are more applicable to simulation games than to non-simula­tion games.

Relationships of Games to Real Life

Educational games may be designed to provide lifelike experiences for students which they could not otherwise have. Some such life experiences are simply not available and others hold possible risks which would be at least undesir­able and at most hazardous. Students can be given the opportunity to practice making decisions, taking action, and to experience the consequences of these processes without the permanent risks of real life.23 In addition to

22Abt, op. cit., p. 120.

providing experiences to which students do not have access, games can be made relevant to circumstances that they are experiencing in real life thus giving them an opportunity to think through situations which are of immediate concern to them.

Games and Student Motivation

Throughout the literature, the most highly and frequently acclaimed attribute of educational games is their capacity to generate student interest, involvement, and motivation. Gordon considers this aspect so significant that she states, "If educational games did nothing more than motivate students, that would be sufficient justification for playing them." Carlson supports this by stating that "What makes games effective ... is their peculiar ability to motivate." The quality of motivation is also noted in several other sources.

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Gaming as a Form of Conceptual Learning

Gordon considers games as "a method of packaging concepts." Caplan and Caplan also point out the relationship of gaming to the process of conceptualization. They suggest that games provide a structure which facilitates achieving the game goals, and which "also becomes the framework for retaining and using information." They further contend that academic gaming is "one of the best ways to get across to children the structure of a subject while minimizing irrelevant information." Boocock identifies conceptual learning as being an important outcome of the gaming process. Several other writers mention facets of conceptual learning as resulting from participating in educational games. Abt, in describing the characteristics of gaming as an educational method states that "emphasis is placed on developing analytic approaches and organizing concepts. . . ." Further, he says that games help the

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28 Caplan and Caplan, op. cit., p. 135.
29 Ibid., p. 136.
30 Boocock, "Instructional Games," p. 110.
31 Abt, "Games for Learning," op. cit., p. 78.
participant develop a sense of structure. Monroe sees games as having the capacity to convey the concept of a total system in operation. Others allude to the conceptual nature of games through statements such as, "games permit the learner to explore a system with freedom;" games permit the student to experience simultaneous interactions or parallel processes; games allow participants to incorporate specific learnings and deal with them as a part of process. With this kind of support, it would appear that educational games deserve attention as an important facet of concept-building efforts.

Games and Socialization

Educational gaming has been identified as a method which serves in the socialization of the participants. In their review of the literature, Inbar and Stoll categorized their findings regarding the socialization outcomes of the

32 Ibid., p. 80.
34 Inbar and Stoll, Simulation and Gaming in Social Science, op. cit., p. 259.
35 Abt, Serious Games, op. cit., pp. 18-19.
37 Gordon, op. cit., p. 18.
gaming experience. They found the socializing elements of gaming to include (1) "moral development," (2) "willingness to cooperate or contribute to a group," (3) "perception of roles of others, recognition of social structure," (4) "practice with situations, strategies, and problems," (5) "achievement values," (6) "sex-role identity," (7) "efficacy," and (8) "orientation to competition." Gordon states that "while games will not necessarily produce diplomats and pacifists, they do require attention to the relation between behaving acceptably and securing one's own interests." Though simulation games may possess greater socializing potential, non-simulation games also make a contribution to the development of some social skills.

Games and Low Achievers

Students may gain intellectual confidence through the discovery that they are able to control or at least have an influence on their environment. Gaming modifies "self-esteem, self-confidence, and feelings of efficacy." Feelings of efficacy refer to feelings of being able to influence one's environment. Students are dealing with relevant, realistic concerns and are able to perceive themselves

38 Inbar and Stoll, "Games in Learning," op. cit., p. 55.

Gaming may hold promise for those students who are generally considered unsuccessful. In addition to enhanced feelings of efficacy, there are other aspects of the gaming environment which offer the potential for the low-achievers. Traditionally, each child recognizes his status within the class (always does well, always does poorly, etc.) the game presents a new and unique challenge. There is no guarantee that the "good" student will win the game or that the poor student will lose. The "good" student is less likely to monopolize the game since all students participate at the same time.

The teacher-dominated learning experience is replaced with a student-directed one. Imaginative solutions to problems are often equally as acceptable as conventional ones. Students may consistently make shrewd moves, but not be able
to explain their actions. 44 In the conventional learning environment, similar moves would more likely go unnoticed because of a child's inability to communicate them. Thus through games, the potential for reducing the gap between the successful and unsuccessful student exists.

Competition and Cooperation

Though the value of the use of competition as an educational technique is much debated, the fact remains that competition is very much a part of the real world for which the educational system is preparing its students. 45 Gordon contends that "All games are competitive to some extent. So are most people. Educational games thus exploit the inclination to compete and channel it for educational purposes." 46 She adds, "Cooperation is a strong element of the very games that are competitive. Players on one team cooperate among themselves to compete with other teams. In games designed for individual roles rather than for teams, alliances are most always necessary for winning. Games thus tap the human instinct to cooperate, even to conspire in contrast to most conventional classroom activities which demand individual performance and frequently penalize

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45 Glazier, op. cit., p. 1. Abt, Serious Games, op. cit., pp. 21, 103.

cooperation." Abt sees games as an opportunity for students to learn "the decent limits of rivalry." The game participants may gain an understanding of the "nature and relative merits of competition as opposed to cooperation in reaching solutions to problems in which individuals or groups have differing goals and interests."  

Games and Evaluation of Students

One of the most consistently criticized aspects of education has been its methods of student evaluation. One advantage which games offer in this regard is that the feedback is immediate. This is a valuable reinforcement for the learning that has taken place. The rewards for success are pleasurable, but "failure to win... does not upset the participating students as does a low or failing subject grade." Games induce "the same kinds of motivations and behaviors that occur in the broader contexts of life." The participants are cognizant of the fact that they are only playing a game yet their game behavior does not reflect

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47 Ibid., p. 25.
49 Boocock, "Instructional Games," op. cit., p. 110.
51 Caplan and Caplan, op. cit., p. 136.
52 Coleman, "Social Processes and Social Simulation Games," op. cit., p. 29.
They take the game seriously, but the outcome—win or lose—is not devastating.

Games are self-judging. It is not necessary for an external force (e.g. the teacher) to make the determination of the quality of a participant's play. In this respect, the teacher acts as an aid rather than judge. The teacher thereby may take on a new relationship with the students. The feedback is perceived as less arbitrary than usual evaluation systems.

There is some speculation that "games may be able to test the comprehension and solution of complex problems better than purely verbal tests. . . ." Certainly, the prospects of evaluating performance through games appear promising. "(Also), with games one can evaluate the students' performances without risking the costs of having errors made in 'real-world' tryouts and without some of the distortions inherent in direct examination."

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56 Inbar and Stoll, Simulation and Gaming in Social Science, op. cit., p. 261.
57 Abt, "Games for Learning," op. cit., p. 78.
58 Abt, Serious Games, op. cit., p. 13.
CRITICISMS OF GAMES AS EDUCATIONAL TOOLS

Despite the praises given to educational games as a method for teaching and for learning, there are limitations of the method which should be recognized. Even if the method itself were near to perfection, there are problems related to those who are involved in its implementation which bring about limitations in its effectiveness as a learning tool. Historically, promising innovative teaching methods have often been misused or overused to the extent that they have failed to live up to expectations. Where the proclaimed values of games are to some extent unsubstantiated by research, the same is true for their limitations.

Commonly Expressed Concerns About Educational Games

The most persistent concern which is raised when educational games are discussed is the issue of their competitive nature. Certainly, the competition vs. cooperation arguments are not new to the field of educational methodology. Another criticism of games is that they may teach the "wrong" values. "... despite replicating real-life situations (simulations) are seen as unhelpful in educating students toward desirable values and attitudes."\(^{59}\) It is reported that some teachers feel that simulation of activities such as bribing and smuggling implies "the condoning or

even the encouragement of immorality."\textsuperscript{60} In this regard, Abt considers the issue here to be one of whether reality should be dealt with "descriptively or in ideal terms or both."\textsuperscript{61} Shirts contends that, "If we do not recognize man's capacity for aggressive, hostile behavior, there is no way we can deal with it constructively."\textsuperscript{62}

Educational games have been further criticized for simplifying reality. If reality is modified in order that it can be manipulated within the limits imposed by the learning situation, are the participants really able to conceptualize about the real world from the experiences of the simulation? Some critics of simulation games contend that participants "acquire not insight but naive and erroneous conceptions about social reality."\textsuperscript{63} The affective elements of real life situations are difficult to replicate in a game.

\ldots events of real magnitude such as death, hunger, separation are divorced from emotional consequence and can only be represented in the most artificial way. Ability to test action without consequence may be a real boon to

\begin{flushleft}
\textsuperscript{60} Abt, \textit{Serious Games}, op. cit., p. 54.

\textsuperscript{61} Ibid.

\textsuperscript{62} Sarane S. Boocock, "An Experimental Study of The Learning Effects of Two Games With Simulated Environments," \textit{American Behavioral Scientist}, X (October, 1966), 9.

\end{flushleft}
structure and strategy perception but it is not conducive to empathetic insight into the lives of others."64

There is considerable debate about what is learned from participating in educational games. Some perceive the learning to be largely that of achieving greater effectiveness in playing the game.65 Others are not so generous, arguing that there is no evidence that learning acquired from games is different from that which can be achieved through conventional methods.66 "Defenders of simulations reply that the learning spurred by gaming is often too intangible to be measured; they contend that games convey a sensitivity to the interplay of forces involved in decision-making or bargaining that other teaching methods can't match."67

As the perceived limitations of gaming come to light, it becomes increasingly apparent that safeguards must be employed in order to minimize whatever negative aspects the method may possess. There are two points where such safeguards may be most logically applied. One is in the game design and the other is with those who employ the game as a teaching tool. As with all teaching methodologies, there is

65Carlson, op. cit., p. 43.
67Ibid.
a certain skill necessary if a method is to be effective in influencing the desired learning outcomes.

Problems Related to the Implementation of Gaming in the Schools

If educational games are to be used in the schools, the teachers will need to accept them as a legitimate activity for serious learning. The very word "game" stimulates a mind-set of frivolity and absence of seriousness of purpose. Such an attitude stands between some teachers and their consideration of games as sound educational tools. In this regard, Boocock and Schild note that both Puritanism and inverse Puritanism affect teachers' thinking toward games. The Puritan attitude is that learning is serious and games are fun; therefore, children cannot learn from games. With inverse Puritanism, games are seen as "morale-building relaxation from the 'real' (and inherently unpleasant) business of learning. But one should not expect children to learn from them."^68

The teacher who does not accept gaming as a legitimate part of the available learning opportunities is perhaps less of a threat to effective use of games for learning than the one who demonstrates wholesale acceptance without the concomitant personal preparation and study. Games require preparation and study prior to use with students in a manner similar to that required of other methodologies. Because of

^68Boocock and Schild, Simulation Games in Learning, op. cit., p. 18.
the potential for complexity, games may require more pre-
paration. 69

The cost of games in both time and money is a legiti-
mate concern. Taylor and Walford note that "Simulations are
time-demanding activities and, therefore, need to prove
of high value to justify a place in the timetable, since
their use may cut out other learning." 70 Likewise, Crawford
and Twelker point out that, "More information can be pre-
sented in less time by other means." 71 At present, simula-
tion games are often very expensive. Costs of $100 or $200
are not unusual.

Other concerns related to the eventual assimilation
of games into the school are also voiced. A review of in-
structional objectives sought by most disciplines will most
likely reveal a propensity toward acquisition of knowledge.
Though simulation games may be used for this purpose (es-
pecially when learners are disinterested, or lack the
skills for acquiring knowledge by other means, or where
application of knowledge is desirable), knowledge acquisi-
tion is not what makes them unique and it is not a

69 Abt, Serious Games, op. cit., p. 30.
70 Taylor and Walford, op. cit., p. 44.
71 Jack Crawford and Paul A. Twelker, "The Design of
Instructional Simulation Systems," Instructional Simulation:
A Research Development and Dissemination Activity, ed. Paul
A. Twelker (Monmouth, Oregon: Oregon State System of Higher
particularly strong facet of simulations. In addition, games may alter the traditional concept of classroom order. Where they are used, there are generally higher noise levels and more disruption of the physical order of the classroom. Further, there are at present limitations in defining and evaluating learning gains.

As some teachers may find games incompatible with their perceptions of the educational purpose, so may some students (though perhaps for different reasons). Some do not like games. "Games require an active, instrumental, and controlling posture toward the environment. Those who are shy or passive, or who simply like to let things happen and take their enjoyment from whatever occurs, may not enjoy the whole experience." Taylor and Walford point out that "simulations should not over-expose or make vulnerable children who are not equipped to cope with certain group conflict or public situations, for example, the child who does poorly and who is unable to improve on a performance through a lack of ability, the sensitive student who is acutely aware of the attitudes of his peers, the shy child who is unable to

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72 Ibid., p. 89.
participate in any discussion." Maidment and Bronstein concur saying, "... there are some students who do not enjoy the required social interaction and competition involved in simulation play, and for these students, simulations are threatening rather than motivating experiences."  

NON-SIMULATION GAMES

The previous sections dealing with values and criticisms of educational games are somewhat generalized yet in some cases apply more specifically to simulation games than to non-simulation games. Since the game to be employed in this research project is a non-simulation game, such games deserve some special attention.

The non-simulation games (sometimes referred to as learning games), though not as well-researched as simulation games, "bring some of the advantages of simulation games to instruction, but do not simulate any social or physical system. Yet they do provide involvement on the part of the learner in the application of concepts and principles drawn from formal disciplines."  

"... they are a unique form of gaming that may effectively develop motor skills, word skills, intellectual skills, or cognitive strategies. In

75 Taylor and Walford, op. cit., p. 37.


77 Twelker, op. cit., p. 68.
fact, learning games seem to be similar to the games teachers have been using for years that involve simple motivational and competitive structures (such as spelling bee's)."  

Crawford and Twelker have identified some of the advantages of the non-simulation games over other education games. These advantages include:

1. Their development is somewhat easier.
2. The completed instructional package is relatively inexpensive.
3. They are easily both inserted and terminated within a curriculum.
4. They are generally acceptable, having a supporting tradition of respectability, e.g. the spelling bee.
5. Few participants, often two or even one, are needed. Others are easily accommodated.
6. Learning objectives, which are usually the acquisition and exercise of concepts and principles, are congruent or identical to standard course objectives. No change of teachers' orientation, or new problems of measuring achievement are presented.

COMPLETED RESEARCH ON EDUCATIONAL GAMES

There is limited research which has been conducted with regard to educational games. Many of the claims which have been made for (and against) games are not clearly

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79Crawford and Twelker, op. cit., p. 94.

substantiated by the research reports that are presently available. Taylor and Walford have summarized a viewpoint that seems to appear fairly consistently in the literature in their statement that of all the studies done "we know of none which suggests that simulation is any worse than other techniques in teaching factual material. In relation to other skills (analysis, synthesis, interpretation, etc.) the evidence varies and is inconclusive." Further, Wentworth and Lewis contend that "much of the research available has probed convenient questions rather than questions important to users and developers." In addition to the problem of limited research on educational gaming in general, the research related to the focus of this study (non-simulation games) is even more meager. Nevertheless, it is a function of this chapter to cite the research pertinent to educational gaming, and since simulation games have received the greatest attention they will dominate this review.

Problems of Research

Twelker has identified some of the primary reasons for the limited research in the field of educational games. He states that,

1. Standardized use of games has been difficult to achieve. Making comparative studies or attempting to replicate findings is a meaningless

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81 Taylor and Walford, op. cit., p. 38.

exercise unless the game can be played time
and again in a similar fashion. . . .

2. Games vary enormously. . . .

3. There is a lack of clear relationship between
the structure of the game and the learning
objectives of a game. . . .

4. There is a failure to recognize the futility
of 'one-shot' research studies. 83

Gordon has cited other reasons for the lack of
sound evaluation for educational games.

First, is the relative newness of the technique,
with a consequent lack of time for collecting
data and developing systematic evaluation pro­
cedures. More serious is the inherent problem
of evaluating any technique in education. It
is extremely difficult to establish experimental
controls for variations in the student test
populations and particularly for the variations
in teachers' personalities, methods and rapport
with students. Even more serious is the fact that
a measuring instrument does not exist. The work
done so far has made one point obvious: Standard
types of tests are grossly inadequate for measuring
whatever it is that games do teach. On the whole,
research to date is probably more significant for
identifying the difficulties of evaluating games
than for precise findings. 84

She further sees that "the most serious obstacle to any
rigorous evaluation of games" is the fact that games tend to
teach something different from that taught by conventional
methods. 85

83 Paul A. Twelker, "Some Reflections on Instruc­
tional Simulation and Gaming," Simulation and Games, III
(June, 1972), 151.

84 Gordon, op. cit., pp. 150-151.

85 Ibid., p. 153.
Additional problems which have impeded the development of respectable evaluation procedures for simulation games include:

1. "... the game approach is by nature open-ended. Any rigid list of what students should learn is incompatible with both the purpose and the operation of the game.

2. ... processes simulated by games are dynamic, with many variables operating at one and the same time. It is unrealistic to try to determine whether or not students understand the entire process prior to a discussion that permits synthesis of the various players' perceptions. But once such a discussion is conducted, test conditions are tainted and it becomes more difficult to isolate what students have learned from the game as distinct from what they have learned from the teacher. ...

3. ... games are usually designed to teach processes that are inadequately treated in text form or are not treated at all."\textsuperscript{86} The researcher recognizes that there is a difference, but has difficulty defining that difference so he asks "what did you learn?" and this has limitations.\textsuperscript{87}

Fletcher and Dobbins, in addition to recognizing problems related to the definition of the learning outcomes and their subsequent evaluation, have added two more observations to the list of research problems. They have

\textsuperscript{86}Ibid., p. 159-60.

\textsuperscript{87}Ibid., p. 160.
perceived that "most simulation games are designed and used as separate entities complete in themselves. Yet if one is to assess them as instructional devices, it must be in terms of their contributions to larger curriculum goals." Further, many research studies have relied on only one episode of game play and they see the learning from such an experience as being limited to that which could have occurred as a result of learning the rules. Other significant impediments to reliable research on educational games have been identified. Fletcher is concerned that absence of agreement on administrative procedures across games detracts from the research effectiveness. Inbar and Stoll consider the fact that there is no common agreement on the definition of games to be detrimental.

Research Results of Selected Studies With Simulation Games

In light of the previously identified problems associated with research with educational games, the results of the following selected research studies should be considered.


89Ibid.

90Fletcher, "The Effectiveness of Simulation Games As Learning Environments," op. cit., p. 427.

91Inbar and Stoll, "Games in Learning," op. cit., p. 54.
In 1966, Inbar used the Disaster Game to study some factors influencing the outcomes of a simulation game. He recognized that not only may there be a variety of learning outcomes from a simulation experience but that the learning and enjoyment which occurs may differ from player to player. He identified four factors which may influence this differential impact of a simulation game:

1. Variations in player backgrounds;
2. Differences in player predispositions;
3. Differences in experiences and behavior during game play;
4. Differences in characteristics of the game groups.

The purpose of this study was to examine the importance of each of these variables with regard to learning and enjoyment.

The simulation game used in the study was the Disaster Game which is designed to teach the players how to react to a major community catastrophe. The subjects were 220 4-H Club members. The research design was a one group pre-test-posttest design. The initial questionnaire assessed players' predispositions and knowledge. (The predispositions being studied were general enjoyment of games, enjoyment of competition, degree to which participation in the Disaster Game was voluntary, study preferences, and interest in topic being simulated.) The post-assessment measured the impact of the game on learning and enjoyment.
The major finding of the study was that group membership was the primary influence on both enjoyment and learning. Player predispositions are also extremely important. The most influential predispositions were curiosity about the topic, voluntary involvement in game play, and willingness to participate in meetings on the topic. This information leads to the conclusion that careful manipulation of the group prior to game play may produce better results.92

One of the claims for games is that they offer the poorer student an opportunity to perform well without the hinderances often imposed by traditional classroom methods. In 1868 Farran undertook a study with underachievers to determine the effect of different types of competition on learning from three simulation games. He hypothesized that intergroup competition in academic matters should increase their importance in the social climate of the school. Further, since effort and achievement are related to the social climate, students should learn more.

The subjects for the study were 123 students at a residential school which offers remedial instruction to boys who have average or above average ability but low academic achievement. Two games (Consumer Game and Life Career Game) were used in this research. Four groups played the games in a group competitive situation and four groups

competed individually. Tests for each game were administered at the completion of the playing sessions.

The hypothesis for the study was rejected. The results indicated that individual competition produced greater learning than did those who competed as a member of a group. The social importance of intellectual achievement for group gamers versus individual gamers also proved unsupportable. Those who competed individually showed greater gains with respect to attitudes toward games.93

The Life Career Game and the Legislative Game are two simulation games developed at Johns Hopkins University. In 1968, Sarane Boocock employed both in a single study to determine the educational value of each. The purpose of the Life Career Game is to provide an opportunity for students to become familiar with the kinds of decisions which must be made with respect to jobs, education, family life, and use of leisure. The Legislative Game is a game of strategy designed to teach how collective decisions are made through negotiation.

The dissimilarity of the two games was not significant to the research since the two groups of participants served only as controls for each other and there was no attempt to compare substantive outcomes. The subjects for the study were delegates to a National 4-H Club conference.

The members of the group of approximately 1200 participants, ranging in age from thirteen to twenty, were randomly assigned to one of the two games. It should be noted that the sample was not representative of a cross-section of students in that the participants were to a large extent academically talented.

Each of the game groups was given the same questionnaire preceding participation in the game. This instrument contained questions related to both games. Following the questionnaire, the games were played by the respective groups. The game session consumed one-half day and represented the participants' only exposure to their game. After game play, the same questionnaire as was used previously was again administered. A few new items pertinent to the particular game played were added.

As a result of this study, Boocock reports that simulation games seem to be able to produce three different kinds of learning:

1. a feeling for the simulated situation,
2. factual information about the real-life condition being simulated,
3. a feeling of understanding and control of the environment (feelings of efficacy).

The general conclusions are as follows:

1. "The career game provided the richest data on the generation of role empathy. Boys who took a feminine role or the role of a potential dropout in the game were more likely to take a liberal or sympathetic attitude toward these
roles after their game experience. The effect on girls of taking a deviant role seems to operate in the opposite direction, although it is not possible to say at this point whether this is a general reaction of girls or unique to this particular group of conformist, achieving girls."

2. "Players' basic image of the political role was not changed by the legislative game, although there was a tendency for boys to have a more negative image after the game than before."

3. "The career game produced the most convincing evidence of factual learning."

4. "The kind of intellectual learning that occurred in the legislative game was in the form of a tendency toward a more realistic view of the pressures on legislators which prevent their acting solely on 'principle'."

5. "The legislative game data revealed a trend toward greater feelings of political efficacy." 94

The period preceding the Civil War was the subject of a research study conducted by Eugene Baker in 1968 in an effort to determine if simulation was superior to conventional methods (textbook, teacher presentation and class discussions) in teaching pre-Civil War American history.

The research participants were 131 eighth graders who were enrolled in four classes of American history. These groups were found to be homogeneous in both IQ and performance on a standardized social studies achievement test. The research design was that of a pretest-posttest-control group design with a third evaluation occurring after a

six-week interval as an effort to measure retention. The test used for all evaluations was the same and was prepared specifically for this experiment.

The results of the study indicated that the simulation was superior to the conventional method with respect to immediate learning. However, the simulation groups exhibited greater losses from posttest scores to the retention test than did those studying under the conventional methods. Despite these greater losses, the simulation group still scored higher on the retention test than did its counterpart.

In addition to the knowledge test, an attitude survey was administered to all subjects. Through this survey, it was found that the attitudes toward centralized policy-making procedures and the appreciation for the complex nature of the pre-Civil War problems were more positive among the simulation group. 95

In 1971, Fletcher used two of the Caribou Hunting Games, as part of an experimental study to assess seven different categories of learning for 370 fifth and sixth graders. The research involved a one group pretest-posttest design. The two games employed were the Bow and Arrow Hunting Game (which was played four times) and the Crossing

Place Hunting Game (which was played six times). Both games involve principles involved in supplying sufficient caribou to meet the needs of an Eskimo family, with the more complex principles appearing in the second game.

Listed below are the seven categories of learning and the research results in relation to each:

1. **Knowledge of the facts of the actual situation.**
   The simulation games were successful in teaching facts to some students who had not learned them previously.

2. **Knowledge of the analogies between the games and the actual situation.**
   The subtle analogies were often not learned and the recognition of the simplications of the game was not apparent.

3. **Knowledge of the structure of the game.**
   The participants exhibited a good understanding of the game model.

4. **Ability to tell directions.**
   Students' ability to read directions from a compass improved.

5. **Knowledge of strategies of the game.**
   The results indicated that few of the students had achieved mastery of the game.

6. **Perceptions of the game.**
   A large percentage of the students demonstrated
an accurate perception of relationships within and between games.

7. Attitudes toward the games.
   The student responses favored the game experience as a learning methodology.

Other findings of the study include:

1. Quality of play improved from one play of the game to the next.

2. Students who played the game well tended to learn more. However, learning of facts or game perceptions seems to occur independent of ability. (The one thing the game teaches well is how to play the game.)

3. With regard to attitudes toward the game, the slower students did not generally perceive it as a productive learning experience whereas the bright students did. (Test results bore out both of them.)

4. Girls did not perform as well on strategy questions as did boys.

In addition to the basic research design, two features of the game design were evaluated. These features involved studying the game record sheets of past plays as a feedback system for improving play and secondly, encouraging experimentation with various strategies in order to discover the maximizing strategy. (This latter feature involved the identification of the maximum possible score.) To test the
importance of each of these features, four experimental conditions were established. In one case, the group received neither previous game record sheets nor information regarding the maximum possible score. The second group were given no previous record sheets, but were told of the maximum score. The third group received the record sheets but not the score. The final group was given both.

The major hypotheses of the study predicted that those who received both the record sheets and the maximum score information would outperform all of the other groups and that those who received no information would be least successful. The performance of the groups which received only one piece of information would fall between the other two. An analysis of the data revealed that if the students are encouraged to plan in order to most effectively utilize the information at hand, there is a substantial increase in knowledge. Of the two game features, planning was more valuable than knowing the maximum score.96

There has been some research evidence that simulation games are less effective than some other methods for teaching factual information. Chartier designed a research study in 1972 to determine if learning outcomes could be maximized by combining the simulation with group discussion.

One hundred and thirty-three undergraduate students

who were enrolled in an introductory speech course at the University of Denver served as the subjects for the research. The simulation game used for the study was Generation Gap. The purpose of the game is to teach the nature of the power structure in a family and the kind of strategies which may be used to resolve family conflicts. The research design involved the administration of four different experimental treatments to four different groups of students and following the treatment with three different assessment efforts. The different experimental treatments were simulation with discussion, simulation without discussion, discussion without simulation, and no-discussion - no simulation (individual study). The assessment efforts involved a rating scale designed to identify attitudes toward the methods (games, discussion, individual study), an achievement test, and score sheets (revealing subject development of game strategy).

The results of the study showed that there was no significant difference among the four groups with respect to the cognitive outcomes. However, the affective learning outcomes for the simulation with discussion group were superior to the other groups.  

Research on Non-Simulation Games

The research specifically dealing with non-simulation games is considerably more limited than that for the

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97Myron R. Chartier, "Learning Effect," Simulation and Games, III (June, 1972), 205.
simulation games. Since this research project deals specifically with the non-simulation game, the non-simulation research deserves particular attention.

The Johns Hopkins Academic Games Program's research with non-simulation games indicated that "these games produce superior student performance on those specific skills that the students must use in playing the games." Most of the reported non-simulation game research centers around The Wff 'N Proof mathematical games. In this respect, the thrust of the evaluation has been toward impact on I.Q. rather than the kinds of issues researched regarding simulation games. This trend is logical since the purposes of the two types of games are somewhat different.

The non-simulation game Wff 'N Proof was used in a research study by Allen, Allen and Miller in 1963, to determine if it would be influential in the development of general problem-solving skills. The experimental subjects for the study were 57 junior high school students. All students were pretested and posttested, with a six week interval, by the California Test of Mental Maturity for the appropriate year in school; the control group of 22 junior high school students were similarly tested.

The experimental group played Wff 'N Proof for 45 minutes to an hour a day, every school day for 29 days. Since the class meetings were two hours in length, the remaining instructional time was devoted to study and discussions related to game rules and their underlying concepts.
and taking tests to determine how well the student was doing. The control group followed a routine of regular classwork for the duration of the experimental period. The dependent variable was pretest to posttest change in non-language I.Q.

The results of the study revealed a significant difference between the experimental and control groups. The mean change in non-language IQ score for the gamers was +17.3 as compared with the non-gamers' +9.2. The primary experimental differences were attributable to the boys. In the experimental group the mean change for boys was +18.7 and the control boys yielded a +3.9 change. The girls in the experimental group showed a +14.3 change but curiously, the control girls showed a +13.6 (difference not significant). The researchers were unable to explain the reason for this disparity between the sexes. The aspects of the gaming experience which could have been responsible for the differences between the experimental and the control groups were not isolated and remain to be investigated.98

An experiment similar to the previously reported one was conducted in 1964 by Allen, Allen, and Ross and represents one of the few instances of attempted replication of a study involving educational gaming. In the second study, junior high school students were again involved however the

period between the pretest and posttest as well as the instructional period were shorter (instructional time remained the same). (There was an approximate three week testing interval.) The experimental group showed a mean change in non-verbal IQ score of +20.9 and the control group, a change of +6.6. The differences related to sex which appeared in the previous study did not occur here. For the boys, the experimental mean change was +22.4 and the control +7.3. The girls in the experimental group showed a mean change of 18.0 and the girls in the control, a change of 5.1. 

In the experimental experiences with Wff 'N Proof, it was noted that class attendance for the game groups was superior to the generally expected attendance. Further research was initiated by Allen and Main in 1972 with another non-simulation game, Equations. Again junior high school students served as the subjects. The experimental group participated in an Equations tournament two days per week and the remaining three weekly class periods were devoted to lectures and working problems. The control groups worked problems and heard lectures all week. The study extended over two school terms. The experiment was set up so that the participating teachers were involved in teaching both game and non-game classes.

Three hypotheses were established regarding the rates of absence for game and non-game situations. The first was concerned with the comparative attendance performance of game versus non-game groups being taught by the same teacher. The second pertained to changes in absenteeism for students who would be part of a game group for the first semester and participate in a conventional learning environment in the second. The last hypothesis related to the absentee rates for first term gamers/second term nongamers as compared with students who participated in the conventional methodology for both terms.

The data for the study show that:

1. The absentee rate was less for gamers than for non-gamers.
2. The absentee rates for students moving from a game to a non-game condition increase significantly.
3. The information for the third hypothesis was marginal. The students who had played the game in the first term had a lower absentee rate in the non-game second term than did the students who had never been involved with the game, but the significance of the differences was less dramatic. 100

100 Layman E. Allen and Dana Main, "The Effect of Instructional Gaming Upon Absenteeism: The First Step," (Ann Arbor: Mental Health Research Institute, University of Michigan), pp. 12-13. (Mimeographed.)
With the research on non-simulation as limited as this both in numbers of studies and scope of hypotheses studied, even fewer conclusions can be drawn about this type of educational game than can be drawn about simulations. However, as was pointed out earlier, non-simulation games tend to deal with material more commonly included in course objectives and in the standardized tests. These two points should make non-simulation games for learning easier to research.

Research Reviews

The following are reviews of research on educational gaming. These reviews present a conglomerate summary of the findings of numerous studies.

Boocock, in the Encyclopedia of Education, summarized the research by identifying these broad conclusions.

1. Games do produce greater motivation and interest, more focusing of attention, and less withdrawal from the learning situation than alternative techniques.

2. Learning and retention of factual material is as great from games as from textbooks, case studies, and lectures.

3. Simulation games have a positive effect on the student's sense of control of his environment and destiny.

4. A given game can be used with students varying widely in age and ability.\textsuperscript{101}

\textsuperscript{101}Boocock, "Instructional Games," op. cit., pp. 109-110.
Inbar and Stoll have drawn these conclusions from their research review.

1. 

In spite of the existence of well-known, often clearly stated hypotheses concerning the socializing functions of games, there is but a small amount of scattered evidence in support.

2. There has been little research done on whether or not particular games have learning effects, yet what research has been carried out is usually affirmative.

3. If there is one general conclusion from this research on games in education, it is that games may prove to be settings for teaching psycho-sociological dimensions rather than purely cognitive material.\(^{102}\)

Wentworth and Lewis found in their research review that as teaching devices simulation games

1. do not appear to have any clear advantage in teaching content to students,

2. appear to have a positive influence on student attitudes,

3. appear to be influential in encouraging students to become more actively involved in the learning process.\(^{103}\)

The Academic Games Program at Johns Hopkins University has produced one of the most substantial evaluations of educational games. In general, it was found that the socializing effects of games "tend to vary from one culture or subculture to another and are not the same for girls or for boys." Further, the fact that students prefer games to

\(^{102}\)Inbar and Stoll, "Games in Learning," op. cit., pp. 57-59.

\(^{103}\)Wentworth and Lewis, op. cit., p. 438.
other classroom activities is identified as the most consistent finding of the program. Other conclusions from this research project include:

1. Simulation games can teach factual information, though not more effectively than other methods of instruction.

2. They can improve students' performance on tasks similar to those the students practice in the game.

3. They can change students' attitudes toward the real-life persons whose roles they take in the game.

4. They "tend to be more effective with students of high academic ability than with students of low ability.

5. Low ability students seem to be as good as their brighter classmates at learning to use winning strategies in the game, but they often fail to grasp the analogies by which the game represents a real-life situation.

6. The amount of time students spend playing a simulation game can make a substantial difference in the effects of the game may make very little difference.

FUTURE NEEDS FOR RESEARCH ON EDUCATIONAL GAMES

As the period of "realistic optimism" about educational gaming matures, the progress of research is evaluated, and classroom experience is extended, the more apparent are the serious gaps in knowledge about gaming as a teaching method. Where in the past there was no research, almost any kind of

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105 Ibid., p. 7.
research was seen as progress; now those involved with gaming are calling for more systematic and planned research efforts.

Fletcher suggests that what is needed is:

1. To select a set of games everyone will agree are games.

2. To select and define a set of 'important' characteristics to vary systematically.

3. To determine the degrees of variation in each of the characteristics chosen for systematic experimental manipulation.

4. To incorporate, for each of the selected games, these degrees of variation into the game, producing different versions of the game, each incorporating a different variation.

5. To define the player characteristic which we think are most important to record, and the dependent variables we feel are most important to explore.

6. To develop instruments which are comparable across the set of games, yet, particularly in the case of the dependent variables, are specific to each game.

7. To set up standard data-handling procedures.\textsuperscript{106}

This general approach is also supported by Boocock and Schild and Twelker.\textsuperscript{107}

Boocock's assessment of research needs takes on a different emphasis. She has identified some general effects which she contends may be "predicted from current theory of

\textsuperscript{106} Fletcher, "The Effectiveness of Simulation Games As Learning Environments," op. cit., pp. 451-452.

gaming but not substantiated by empirical research." These following learning effects should be evaluated:

1. an understanding of relative costs and rewards of alternative strategies in a given situation;

2. an understanding of the nature and relative merits of competition as opposed to cooperation in reaching solutions to problems in which individuals or groups have differing goals and interests;

3. an understanding of the role of chance in human affairs and the degree to which one's luck can be controlled by good planning;

4. an understanding of general principles and concepts by actual experience of them rather than simply learning about them.108

She also feels that carry-over effect of the game into real-life behavior deserves some attention. (Also see McClusky).109

Further suggestions for additional research problems include:

1. What are the long-time effects of gaming?110

2. What is it about simulation which arouses and sustains interest and enthusiasm?111


111Taylor and Walford, op. cit., p. 34.
3. What goes into the design of a good simulation game?  

4. How do games compare with other methods?  

5. What are the differences at deeper levels of cognitive learning among the various methods?  

6. Is there generalizability between games?  

7. When studies are replicated, do the results compare favorably?  

8. How can we use simulations most effectively?  

Though some of these suggestions for research apply only to simulation games, a number relate to research with either simulation or non-simulation games.

CONCLUSIONS

The research which has been carried out with educational games is extremely limited. The literature is rich with empirical evidence of the potential which games hold.

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113 Gordon, op. cit., p. 160.
114 Chartier, op. cit., p. 215.
115 Fletcher, "The Effectiveness of Simulation Games as Learning Environments," op. cit., p. 427.
116 Ibid.
for effecting various kinds of learning. Both the research and the empirical evidence are directed primarily toward simulation games rather than non-simulation games.

In summary, the writer believes that the general values that are claimed for educational games as well as with the status of the related research evidence are:

1. **Games can create life-like situations which can be manipulated without the real life risks.**
   
   There is little research relating to this facet of simulation games, per se. However, there is evidence that the psychological and sociological dimensions of issues are frequently emphasized more than the cognitive.

2. **Games are highly motivating learning experiences.**
   
   This is the one claim which seems to have received the greatest research and empirical support.

3. **Games provide a format for conceptual learning.**
   
   The simulation games often emphasize the use of the higher level cognitive skills such as analysis and synthesis and it is logical to assume concepts are being formed. The research on this proclaimed value of gaming appears to be extremely limited. The studies with Wff 'N Proof may reveal that conceptual learning occurred.

4. **Games play an important role in the development of social skills.**
   
   There is little evidence to support this claim.
5. **Low achievers are not as handicapped in an educational game as in conventional classroom methods and therefore gain confidence.**

The research on this specific issue is limited. There is indication that there is more student involvement in the learning activity which may imply that students who had been passive learners might have begun to participate. This participation, however, does not necessarily imply improved academic performance.

6. **The competitive aspect of games enhances learning.**

It is surprising that a great deal more research has not been carried out on this issue. That which has been done in relation to games seems not to detract from competition.

7. **Games provide an evaluation methodology which avoids some of the criticisms of conventional testing.**

There is no evidence of any research on this issue.
CHAPTER III

DESIGN AND PROCEDURES

The following information presents a detailed description of the research design and of the procedures employed in its implementation.

STATEMENT OF THE PROBLEM

The purpose of this study is to investigate the effectiveness of the game Propaganda in teaching selected persuasion techniques ("techniques of irrelevance") which may be used in the advertising of health products or services. This is a pilot study in that the instruments employed are generally unproven and are of unknown validity and reliability. Since limited research has been conducted on the use of non-simulation games, the nature of the needed research is not clear. Further, there has been no research reported on the use of games--simulation or non-simulation--in Health Education.

The sub-purposes of this research are as follows:

1. To initiate the development of a valid and reliable test comprised of advertisements for health products which reflect the "techniques of irrelevance" used in the game Propaganda.
2. To initiate an assessment of the validity and the reliability of the test instrument used as the pretest and the first posttest.

3. To identify the extent of learning that occurs as a result of the use of certain elements common to the primary research groups:
   a. To assess the impact of the pretest experience on performance on the Posttest II.
   b. To assess the impact of the written descriptions of the techniques (Techniques Sheet) on performance on the first posttest and the second posttest.

Hypotheses

The aforementioned purpose and sub-purposes for this research project give rise to these hypotheses. It is hypothesized that:

1. Students who play the "techniques of irrelevance" section of the game Propaganda will be more accurate in labeling selected examples of health product or service advertising than those who learn the advertising techniques by a non-game instructional method as determined by scores on Posttest I and Posttest II.

2. Students who adapt the "techniques of irrelevance" section of the game Propaganda by providing health-related examples will be more accurate in their identification of techniques used in the advertising of health
products than those who do not adapt the game as determined by the scores on Posttest I.

3. Those subjects who are involved in the adaptation of the "techniques of irrelevance" section of the game Propaganda will exhibit greater long-term retention than those who only play the game and those who do not participate in the gaming experience as determined by an analysis of mean scores on Posttest I and Posttest II.

THE GAME PROPAGANDA

The non-simulation game to be used in this research is Propaganda which is part of the Wff 'N Proof series of games. It is unique from most of the Wff 'N Proof games in that it does not address itself to mathematical concepts, but rather, is designed to help its participants recognize the techniques which may be employed to influence the individual's thinking processes. It is these persuasion techniques (which frequently appear in advertising) which may influence the decisions made by the individual with respect to the selection and purchase of health products and services. Though the game itself does not emphasize this health aspect, it does employ a wide variety of persuasion techniques and it includes those which are typically exhibited in the advertising of health products and services.

The format of the game is fairly simple, but because of the large number of persuasion techniques included (55), it can become quite complex in making discriminations among
similar techniques. Propaganda is divided into six sections with each section representing a particular category of persuasion techniques. These sections are as follows:

Section A: Techniques of Self-Deception
Section B: Techniques of Language
Section C: Techniques of Irrelevance
Section D: Techniques of Exploitation
Section E: Techniques of Form
Section F: Techniques of Maneuver

Each section has at least eight different techniques. The game requires extended play before participants are able to recognize each technique and to discriminate among them.

According to the game instruction booklet, the game is best played when there are two to four players. The game materials include a prediction wheel for each player, a series of cards giving examples of the persuasion techniques, a scoring chart, and player tokens. Each player, at his turn, reads an example card aloud to the participants. Each player then independently selects the persuasion technique he believes is represented in the example and turns his prediction wheel to the number of that technique. When all have made a decision, the prediction wheels are simultaneously exposed. Points are awarded to those who are correct and the player tokens are moved accordingly on the scoring chart. The object of the game is to reach the top of the chart and thus demonstrate that one is a "clear thinker."
As was mentioned earlier, to play and master the game Propaganda in its entirety would require a considerable time investment. In order to fit the use of the game into an existing course, this time element would have to be diminished. Rather than introducing all major categories of persuasion techniques, only one category will be used in this study. The section dealing with "techniques of irrelevance" was selected on the basis of its particular relevance to advertising for health products and services. (This is not intended to imply that the remaining techniques are not used in such advertising.) This section was selected on the basis of a survey of health product advertisements in popular magazines. When these ads were informally categorized by technique, the largest number appeared to be representations of the "techniques of irrelevance."

THE "TECHNIQUES OF IRRELEVANCE"

Following is the description of each of the "techniques of irrelevance" as they are presented in the player's manual of the game Propaganda.

1. APPEARANCE

Example: A floor wax nationally advertised on television is shown in the commercial being applied to a floor with the immediate result of a brilliant luster. The viewer does not know that the floor has been buffed and polished for days, and then dust coated just before the wax was applied in the commercial.

Meaning: The appearance of a thing (or person) is made the basis of our acceptance or rejection without any thought that this appearance may be a deceptive indicator of value.
2. MANNER

Example: "He was such a well-behaved man, so understanding, so sincerely helpful. He wanted to help us. I couldn't insult him. So I gave him our savings to invest. He seemed so trustworthy.

Meaning: A person's manner of behaving is made the basis of our acceptance or rejection of him without any thought that this manner may be a deceptive indicator of value.

3. DEGREES AND TITLES

Example: The name on the office door reads "James A. Rydack, Th.B., M.Th.R., As.D., Counselor Extraordinary of the Society of Metaphysicians." A woman about to enter the office says to her husband, "With all those degrees and that title, he must know his stuff."

Meaning: We buy or we believe out of respect for degrees or titles attached to the names of those who persuade us.

4. NUMBERS

Example: From an advertisement: "One million more sold this year than last."

Meaning: We buy or believe because of the large numbers associated with the product or proposition.

5. STATUS

Example: Advertisement appearing in the Hampshire Gazette, January 29, 1790: "President Washington, when he addressed the two houses of Congress on the 8th instance, was dressed in a crow-coloured suit of clothes of American manufacture. This elegant fabric was from the manufactory in Hartford."

Meaning: Persons or objects for which we have a strong sentiment of respect and esteem—or which at least possess some degree of fame or prestige—are introduced into the argument as endorsing that which we are asked to buy or believe.

6. REPETITION


Meaning: We buy or believe because we have heard or seen the idea or product name so often.
7. SLOGANS

Example: "WHEATLESS, THE BREAKFAST OF CHAMPIONS"; "LSMFT" (LUSTY STRIFE MEANS FINE TOBACCO); "WHEN BETTER CARS ARE BUILT, BLUINK WILL BUILD THEM"; "BETTER BUY BARDS-EYE."

Meaning: A slogan is a short, meaningful, catchy phrase or sentence intended for general consumption and designed to terminate thought and promote action in favor of the slogan maker. However true the slogan may be, if your action is merely a favorable response to the slogan, the technique is successful.

8. TECHNICAL JARGON

Example: Advertisement: "Liberty Rubber's new tires contain durium, the bonding material that makes these tires wear for years."

Meaning: The technique of technical jargon is the use of technical language or unfamiliar words, whether contained in the dictionary or freshly coined, for the purpose of impressing people.

9. SOPHISTICAL FORMULA

Example: Mrs. Jones: "You know, Ann, I think the Browns must be having trouble. The last two mornings I've seen Tom Brown leave the house, slam the door, and drive off in his car looking awfully mad. I'll bet they're headed for a divorce."

Mrs. Smith: "I don't know, Barbara. Really, they've always seemed to be very much in love."

Mrs. Jones: "Well, all I know is that 'where there's smoke, there's fire!"

Meaning: To shut off or close the argument a popular maxim or old saying is quoted. But every controversial situation must be settled in its own terms, and not on the merits (if any) of some proverb.¹

THE SUBJECTS

The subjects were students in the Healthful Living course at the Eastern Michigan University. This is a freshman level course designed to provide an introduction to personal health issues. It is required for all students who major in Physical Education or Recreation and is open to all other students on campus. There were nine sections of the course and each section participated in the research project providing a total of 224 subjects. There were 122 males and 102 females ranging in age from 17 to 43. The majority of these students (152) were of age 21 or under. Fifty-four were over age 21 and 18 declined to respond to the question. They were distributed by year as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>42.4</td>
</tr>
<tr>
<td>Sophomore</td>
<td>15.6</td>
</tr>
<tr>
<td>Junior</td>
<td>15.2</td>
</tr>
<tr>
<td>Senior</td>
<td>22.5</td>
</tr>
<tr>
<td>Graduate</td>
<td>.9</td>
</tr>
<tr>
<td>Undecided</td>
<td>3.6</td>
</tr>
</tbody>
</table>

They represented 35 different major fields of concentration with 93 students majoring in either physical Education (78) or recreation (15). The remaining 131 were distributed among the 33 other major areas of study.

There was no attempt to formally randomize the sample. The various treatment groups were established prior to the beginning of the term and before section enrollment was known. The assignment of treatments to sections was influenced primarily by two factors. First, the number of
sections to be taught by a given instructor was ascertained so that treatment could be assigned in a manner that would minimize instructor involvement in more than one type of treatment. Secondly, the instructor assigned to Control I (which was to receive instruction by a non-game, novel approach) was selected on the basis of his willingness to employ a method to which most students had not previously been exposed.

It was assumed that the students would be randomly distributed in each of the sections of the course since no efforts were made to register certain students in certain sections. It is fully acknowledged that pure randomization is not likely to be accomplished where choice is permitted and that there will always be student preferences for either class hours or particular instructors or both. Nevertheless, any attempt to randomize before or after registration would have been impossible considering the number of students involved and the times and numbers of sections of the health course alone not to mention the remainder of each student's class schedule.

THE INSTRUCTORS

The five participating faculty members were those assigned to teach the various sections of the Healthful Living course by their department. Each is an experienced teacher. None had had experience with the game Propaganda or use of games in the classroom. Prior to classroom
initiation of any facet of the research project, the participating faculty members were briefed regarding the nature of the project and of their individual responsibilities. Those who were to be involved with the game Propaganda were brought together to play the game so that they would be familiar with its format and the rules for play.

All instructions for administering the tests and the game were provided in writing for the faculty. (See Appendix C).

The instructor whose responsibility it was to provide instruction by another "novel method" was given Moulds' book, Thinking Straighter, where each "technique of irrelevance" is described in detail. It was his responsibility to understand the techniques well enough to provide appropriate learning experiences for his students. The choice of the "novel method" to be used with this group (Control I) was mutually determined by the instructor and the researcher. The method chosen had to be different from the conventional classroom methods and similar to a non-simulation game in as many respects as possible without being a game, per se. The choice made was that of the inquiry method.

THE ASSESSMENT INSTRUMENTS

This study will employ two different assessment instruments for three separate episodes of evaluation of the subjects.
The Pretest and Posttest I

The Pretest is composed primarily of items prepared for the participants in the National Academic Games Olympics by the late Dr. George Henry Moulds who was a professor of philosophy at Kent State University. Further, he authored the book Thinking Straighter, which served as the basis for the game Propaganda.

The Academic Games Olympics have been held for ten years (1966-1975) and represent an extension of James Coleman's assertions that competitive opportunities are necessary to give status to the academic achiever similar to that bestowed upon those who excel in athletics. The Olympics offer national competition for elementary, middle school, and senior high school students in the social studies, language arts, and mathematics. Both simulation and non-simulation games are used in the Olympics. Each year approximately 400 students (predominately from Louisiana, Florida, Michigan, Pennsylvania, Texas, and California) participate in five days of gaming competition.

The Pretest items which did not come from the Academic Games Olympics were taken from Thinking Straighter. This maneuver was necessary in order to obtain a test comprised of at least one item for each of the nine "techniques of irrelevance." There are no statistical data available for the items which make up the pre-test. The purposes of the Pretest are to help determine the homogeneity of the various groups involved in the experiment, and to assess relative
increase in knowledge following the game or non-game experiences when compared with the scores of Posttest I. Posttest I is identical in content to the Pretest.

Posttest II

Posttest II is the second distinct instrument used in the research. It is comprised of 19 items which are actual advertisements for health products. These advertisements were collected from those which appeared on television or in popular magazines such as Reader's Digest, Ladies Home Journal, Today's Health, and Time. Each advertisement reflects one of the "techniques of irrelevance" found in the game Propaganda and to which the subjects have been exposed. Once the advertisements were collected, the faculty who were participating in those portions of the experiment which involved teaching the "techniques of irrelevance" (either through the game or through the inquiry approach) participated in determining the face validity of each item. This process involved four of the five instructors participating in the experiment. Each of these faculty members was given a packet of the items and instructed to identify the "technique of irrelevance" represented by the example. They were permitted to refer to any of the documents describing the techniques. When this task was completed, this group met with the researcher and agreements and discrepancies were identified item by item. Since several of the advertisements contained significant components of more than one technique, some items were accepted
with two possible answers. In scoring, either answer was acceptable. Of the sample items given the faculty for validation, there were two on which agreement could not be reached. Those were not included in Posttest II.

One notable difference exists between the format of the Pretest and Posttest I and the format of Posttest II. For both the Pretest and Posttest I, the names of the "techniques of irrelevance" were provided for the students on the test sheet, and they had only to refer to this list in attempting to match example and technique. Because the name of the technique is in several cases somewhat of a give-away when comparing it with an example, this procedure was not acceptable for the second posttest. The format of Posttest II provided only the advertisement and a blank on which to write the name of the example.

DESCRIPTION OF THE TWO METHODS

The research involved two methods of instruction. The objective for both methods was that the student should be able to identify and label the "technique of irrelevance" used in the advertising of health products. Of prime research interest was the non-simulation game method. The method to which the game was compared is that commonly called the inquiry method. This method helped serve as control for such problems as the Hawthorne effect. It was chosen in part because it represented a technique with which the students were not likely to be any more familiar than the
use of a game as an instructional procedure. In addition, it was a method which was satisfactory for teaching toward the same learning outcomes as the game, and it possessed characteristics similar to those of gaming. Should significant differences in test performance between the two groups be found, the similarity of methods should help in analyzing the reasons for those differences.

The Game

A game is "an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context."² The game Propaganda can be characterized as having the essential elements of drill as practiced in more conventional learning situations. However, this "drill" is modified by allowing for some flexibility in that a given response to a stimulus may be challenged. Each game participant initially formulates his or her perceptions (or sets of cues) of the nature of each "technique of irrelevance," and throughout the game has those perceptions either reinforced or reproved with each play. Play of Propaganda can be briefly summarized in the following steps. (For a more elaborate explanation, see Appendix A).

1. An example of one of the "techniques of irrelevance" is read to the players.

2. Each player independently determines the name

of the technique which he or she believes is best characterized by the example.

3. The individual answers are exposed with the possibility of three different outcomes.
   a. All answers agree.
   b. The majority of the answers agree
   c. There is a tie

4. Where the majority agree, that answer is taken as "correct" unless the minority answerer chooses to challenge. He or she may successfully argue the case and win the points.

5. If there is a tie, the "correct" answer which was determined by the game designers is consulted.

Propaganda is a prediction game where the participant's score reflects not right and/or wrong answers but a "batting average" of his ability to predict the "best" response. Through repeated play, each participant should become more adept at recognizing the cues that are the earmarks of a given "technique of irrelevance."

A research modification of the game method (for the purpose of this study) will involve the adaptation of the game Propaganda by creating new examples of each of the "techniques of irrelevance." These new examples will be developed by the students and must reflect the advertising of a health-related product or service.
The Inquiry Method

Inquiry learning is not entirely dissimilar to that described for the game. "Inquiry... is a method of learning which stresses self-discovery through identifying a problem, gathering information relating to it, analyzing the data, and arriving at a defensible conclusion... The inquiry approach is less structured than most other learning methods, employs multisensory techniques, and encourages independent and creative thinking."³

The "inquiry" classes were given the opportunity to see and hear a wide variety of advertisements—not all of which represented one of the "techniques of irrelevance;" however, all techniques were represented. There were three different sources of these ads: 1) a tape recording of the 1971, Radio Clio and Effie Awards; 2) a video tape of the 1973, TV Clio Awards, 3) magazines and newspapers. (The Clio and Effie Awards are to the advertising world what the Oscar and the Emmy are to motion pictures and to television entertainment.) Each class was divided into groups and each group was responsible for finding examples of certain of the "techniques of irrelevance" and for teaching those techniques to the remainder of the class. In so doing, they had to be prepared to justify their choices and to help clarify each technique for the others.

As was mentioned earlier, there are some similarities between the two methods. Both were student centered and required little classroom direction from the instructor; both created a learning environment which was stimulating and responsive to student action; both provided opportunity for making and supporting decisions. One outstanding difference between the two was that the game method employed a competitive mode while the inquiry method employed a co-operative one.

THE RESEARCH DESIGN

Since this research is a pilot study, a number of factors were investigated simultaneously when under other circumstances they might have been sequenced. As a result, the research design actually involves a combination of three basic designs two of which are pre-experimental and one which is quasi-experimental. The pre-experimental designs were used to attempt to determine the learning effects of the Pretest and the Techniques Sheet (a document presenting descriptions and examples of the "technique of irrelevance) elements common to the three primary research groups (Experimental I and II and Control I). The one-shot case study was used to determine the effect of the Pretest (Posttest I) on Posttest II. The one-group pretest-posttest design was employed in assessing the learning effect of the Techniques Sheet. The quasi-experimental design was a non-equivalent control group design with which the research
hypotheses were tested. Figure 1 is a diagram of the design.

<table>
<thead>
<tr>
<th>Non-equivalent Control Group Design</th>
<th>Experimental I</th>
<th>0 X₁ 0 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental II</td>
<td>0 X₂ 0 0</td>
</tr>
<tr>
<td></td>
<td>Control I</td>
<td>0 X₃ 0 0</td>
</tr>
<tr>
<td>One-shot Case Study Design</td>
<td>Control II</td>
<td>X₄ 0</td>
</tr>
<tr>
<td>One-group Pretest-Posttest Design</td>
<td>Control III</td>
<td>0 X₅ 0 0</td>
</tr>
</tbody>
</table>

0 = Assessments  
X = Treatments

Figure 1
The Basic Research Design

This design involved the use of five different research groups. The groups which participated in some facet of the non-simulation game were categorized as "experimental" and all other groups were "control". With the focus on the learning objective of being able to identify and label the "techniques of irrelevance", the basic activities and functions of each group were as follows:
1. Experimental I played and adapted the game Propaganda for the research purpose of determining the learning productivity of such a teaching technique.

2. Experimental II played the game and was involved in no adaptation activities. The function served by this group was to help ascertain if the adaptation activity made the game more productive as a learning device.

3. Control I was instructed in the "techniques of irrelevance" through the inquiry approach. This group served to indicate if there was a difference in learning between the two similar but "novel" teaching techniques.

4. Control II received no instruction regarding the "techniques of irrelevance." The purpose for this group was to help determine how much learning took place just by virtue of taking the Pretest (Posttest I).

5. Control III received no instruction on the "techniques of irrelevance" beyond being assigned the Techniques Sheet for reading. This group served to determine the learning effect created by the Techniques Sheet.

There were 224 student participants in the study. The number of subjects that were in each group are as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>54</td>
</tr>
<tr>
<td>Experimental II</td>
<td>66</td>
</tr>
<tr>
<td>Control I</td>
<td>49</td>
</tr>
<tr>
<td>Control II</td>
<td>26</td>
</tr>
<tr>
<td>Control III</td>
<td>29</td>
</tr>
</tbody>
</table>

It should be noted that these numbers fluctuated as the research progressed due to absences, course withdrawals, or absence of necessary information, i.e., year in college.
Table 3.1 presents an overview of the research groups and the activities in which each participated.

**TABLE 3.1**

**SUMMARY OF RESEARCH ACTIVITIES BY GROUP**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Exp. I</th>
<th>Exp. II</th>
<th>Cont. I</th>
<th>Cont. II</th>
<th>Cont. III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<td>x</td>
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<tr>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**PROCEDURES**

The following sections describe the procedures used in implementing various aspects of the study.

**Faculty Orientation and Debriefing**

Prior to the beginning of the term in which the research was conducted, each participating faculty member was informed of the up-coming study, briefed on the extent of their potential involvement, and asked if they would be willing to participate. After the term began, the faculty
were brought together for an overview of the project and further definition of individual responsibilities. A schedule of activities was distributed along with instructions for the administration of the Pretest. A subsequent meeting was held for those who were to be involved with the play of Propaganda. The purpose of this meeting was to review the rules of the game and to play through it so that each faculty participant would understand the nature of the game and its equipment. An additional meeting was held with the two faculty members whose classes were to adapt the game to examples of advertising for health products. The instructors were advised that all should refrain from any instruction on advertising techniques except as it was a part of the research project. Further, the textbooks used for the various sections were examined to be certain that they were free from related information. (Since textbook selection was up to each individual faculty member, two different books were in use at the time of the research.) Other communications were accomplished on an individual basis until after the game experience was completed. At this point, the faculty members who were involved with the game in either its original or its adapted form were brought together for a debriefing session. The questions which were posed for the faculty are:

1. Were you comfortable with the game? (If not, what could have been done to have aided you more?)
2. What were your students' reactions to the exercise in general?

3. If you were to use the game again, what changes would you make?

4. Would you consider using other games in your classroom?

The general responses to these questions are reported in Chapter IV.

Mechanics of Administering the Game

The materials from the original game were reproduced in order to provide sufficient materials for all participants. Class rosters were obtained in advance of the game play and teams of four players each were randomly assigned. A packet of playing materials was prepared for each team. Each packet contained all of the items necessary to play the game such as tokens, prediction wheels, tally charts and selected technique examples. The Propaganda game provides a total of forty examples of the nine "techniques of irrelevance". For each play of the game, each team had eight different examples in its game packets. These examples were distributed in such a manner that no team received the same example twice and that each team had an opportunity to deal with at least one example of each "technique of irrelevance." At the end of each period of play, all materials were returned to the researcher to be reassembled for the next class meeting.
In the case of the Experimental I groups, after the initial play of the game, each team was assigned five "techniques of irrelevance" for which it was to prepare one health product or service-related example. When this task had been completed, the teams exchanged examples and played through the game. The following class period, the examples prepared by one class were exchanged with its companion class and the game played one more time. Once again the examples were distributed so that each team had exposure to a variety of "techniques of irrelevance."

Experimental Groups' Activities

The first day of the research program, all subjects involved in the Experimental groups I and II were given the Pretest. After this was completed, each student was given his own copy of the Techniques Sheet and instructed to read it prior to the next class meeting. The remainder of the class meeting time was devoted to instruction in Consumer Health matters excluding any discussion of advertising techniques in general or the "techniques of irrelevance" in particular. The second day was devoted to familiarizing the subjects with the game and its equipment and to playing through it for the first time.

The game materials were prepared for each group in advance of the class meeting. In an effort to preserve as much in-class time as possible and to insure that each game participant would be exposed to examples of all of the
"techniques of irrelevance", teams were assigned and a packet of playing materials was prepared for each team. These packets included all that was necessary to play the game. Since the game play was spread over three class days, the 40 examples of the "techniques of irrelevance" provided by the published game were divided for each team so that there would be no repetition of examples for a given team throughout the experience. For the Experimental II classes, this meant having eight examples for each day's play. The procedure was more complicated for the Experimental I groups since they were to be involved in adapting the game. In order to assure exposure to examples of all of the techniques, the first day's play was handled the same as for Experimental II. On the second day when the adaptation was to occur, each group was assigned five different techniques for which it was responsible for developing health product-related examples. On the final game day when the two Experimental I classes exchanged their created examples, these were so assigned as to provide eight distributed examples for each team.

Experimental I

This group was the group that would be involved in making-up new examples of the "techniques of irrelevance." A number of authorities on gaming as an educational technique had suggested that perhaps the best way to learn from a gaming experience is to be involved in the design of a game. Since this research dealt with an existing game, an
alternative to the game design approach was the game modification approach. The game Propaganda does not provide many examples of the "techniques of irrelevance" which are specifically related to health products or services. By taking each technique and creating an advertisement for a health product, the subjects should see a clearer relationship between the game exercise and that which they were studying, but more importantly, they should improve their learning as measured immediately after the gaming experience as well as after an interval of time had elapsed.

On the first day of gaming for Experimental I, the method of game play was established and the subjects played through it with eight selected examples. On the second class day, the teams received five assigned "techniques of irrelevance" and five blank cards. Their assignment was to create an advertisement for a fictional health product or service for each of the techniques assigned to them. Each example was written on one of the blank cards and the answer was placed on the opposite side. Though the teams could divide the labors within their ranks, all team members were to review the ad and verify the answer before their task was considered complete. When all teams had completed this phase of the activity, the examples were exchanged with a pre-assigned group (in order to assure exposure to all techniques), and play the game with the newly created examples. At the end of the class period, all cards were collected
to be used by the companion class during the next class meeting.

The third day of gaming for Experimental I involved playing the game one more time, this time using the examples created by the companion class. Where examples were not clear or where the given answer was disputed, these cards were given to the instructor with an explanation of the concern. The following class meeting, they were returned to the authors for clarification.

At the beginning of the fourth class meeting, the subjects were given Posttest I. Following this, there was no further activity related to the research project until nine weeks later when Posttest II was administered.

**Experimental II**

This group was assigned the task of playing the game for three successive classroom episodes. This group followed the same procedures as did Experimental I on the first day with the Pretest, and the distribution of the Techniques Sheet. Likewise, the next day's activities were the same (initial play of the game). On the second and third gaming days, Experimental I continued to play the published game with no attempts to adapt. Each day, each team received a new set of eight examples. Over the course of the three days of game play, each subject was exposed to 24 of the 40 game examples of the "techniques of irrelevance" and to at least one example of every technique. The play was limited to
eight examples per day to reduce the risk of over-exposure to the game while trying to keep the amount of time spent learning the "techniques of irrelevance" somewhat equal among the three major groups (Experimental I and II and Control I).

Following the three days of gaming, Posttest I was administered. In the ninth week, Posttest II was given.

Activities of the Control Groups

There were three control groups with Control I playing by far the greatest role. It was Control I that used the inquiry approach to achieve the same learning objective as was established for the experimental groups. These classes (Control I) did not conform to the usual three fifty minute class periods per week. Thought the instructional time was equated, it was distributed differently. One class met twice weekly for 75 minute sessions. The second class met once a week for a two hour session.

The Control I class that met twice a week followed the following procedures. At the beginning of the research project, the students were given the Pretest and the Techniques Sheet was distributed. During that same class period, the Techniques Sheet was read and the students were advised that they could volunteer for a group to research specific "techniques or irrelevance." There were four major groups each responsible for one of the following sets of techniques:

1. Appearance, Manner, Numbers

2. Degrees and Titles, Status
3. Repetition, Slogans

4. Technical Jargon, Sophistical Formula

The participants were further informed that they would be responsible for teaching their techniques to the rest of the class.

Stations were set up around the classroom so that the groups could search for examples of their particular "techniques of irrelevance." At one station was a tape recorder with the 1971 Radio Clio and Effie Awards; the second station provided a video tape of the 1973 TV Clio and Effie Awards; at the third station there was a supply of magazines and newspapers and several sets of scissors and cardboard and paste for preparing the ads for display. The groups were free to travel from station to station to search for examples of their techniques. The students were free to exchange information both within and among groups.

During the second class meeting, each group shared the results of the search with the others in the class. They passed around the newspaper and magazine examples and played appropriate spots on the tapes. Each group answered questions and attempted to defend the choices that had been made. When this activity was completed, the remainder of the class period was devoted to activities unrelated to this project. At the beginning of the next class meeting, Posttest I was given, and Posttest II administered nine weeks later.

Control II and Control III were included as part of
the research to attempt to identify the learning role played by the two significant elements involved in the instruction in both the game and the inquiry methods. Control II was established for determining the effect of the Pretest on learning as measured by Posttest II. Since Pretest and Posttest I were identical, the Pretest was given as Posttest I so that it could be determined that the instruction received on consumer health had not contaminated the group. Further, the time span between exposures to Posttest I and Posttest II would then be equal for all groups. The instructor for this group was asked to teach the consumer health unit as usual but to exclude any reference to techniques of advertising. Following this unit, the Posttest I was administered at the same time as it was given to the other groups. Nine weeks later, Posttest II was given to this group.

The purpose of Control III was to help determine the learning effect of the Techniques Sheet. These students were given the Pretest at the same time that the Experimental I and II and the Control I groups were completing their game play or inquiry activities. At this same time the Techniques Sheet was distributed and the students were instructed to read them before the next class meeting. At that next meeting, Posttest I was administered followed by Posttest II nine weeks later.
Scheduling of the Research

The project covered thirty-one class meeting days from Pretest to Posttest II. In an effort to avoid unnecessary confusion for the participating faculty at the very beginning and very end of the term, this research was initiated a week-and-a-half after the term began and terminated three weeks prior to the end of final examinations. Instructional time devoted to the "techniques of irrelevance" was approximately equal for those who played the game (Experimental I and II) and those who participated in the other novel method (Control I). Excluding the time required for the administration of the tests, there were roughly one hundred and five instructional minutes remaining for play of the game or administration of the inquiry method. Each play of the game required no more than 30 minutes. When play of the assigned portion of the game ceased, the instructors were advised to proceed with instruction other than discussion of the "techniques of irrelevance."

A schedule of research events is presented in Table 3.2. There is a day-by-day breakdown of the activities by group.
### TABLE 3.2

**SUMMARY OF DAILY ACTIVITIES BY GROUP**

<table>
<thead>
<tr>
<th></th>
<th>Exp. I</th>
<th>Exp. II</th>
<th>Control I*</th>
<th>Control II</th>
<th>Control III</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 1</strong></td>
<td>Pretest Distribution of Techniques Sheet</td>
<td>Pretest Distribution of Techniques Sheet</td>
<td>Pretest Distribution of Techniques Sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video tapes of Clio and Effie Awards.</td>
<td></td>
<td>Video tapes of Clio and Effie Awards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Search magazines for examples of “techniques of irrelevance”.</td>
<td></td>
<td>Search magazines for examples of “techniques of irrelevance”.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 2</strong></td>
<td>Play “irrelevance” portion of original game.</td>
<td>Play “irrelevance” portion of original game.</td>
<td>Discussion and summary of previous days findinsgs.</td>
<td>Posttest I</td>
<td></td>
</tr>
<tr>
<td><strong>Instructional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 3</strong></td>
<td>Design new examples of “techniques of irrelevance.”</td>
<td>Play “irrelevance” portion of original game.</td>
<td>Discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 4</strong></td>
<td>Play adapted game.</td>
<td>Play “irrelevance” portion of original game.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 5</strong></td>
<td>Posttest I</td>
<td>Posttest I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 31</strong></td>
<td>Posttest II</td>
<td>Posttest II</td>
<td>Posttest II</td>
<td>Posttest II</td>
<td>Posttest II</td>
</tr>
</tbody>
</table>

*Both Control I classes met on a pattern unlike the majority (which was three fifty minute classes per week). One Control I met twice a week for one hour and fifteen minutes per meeting and the other met once a week for two hours.*
PROPOSED STATISTICAL TREATMENT OF THE DATA

The following is an overview of the basic statistics that will be used to help interpret the data collected in this study.

The Instruments

The quality of the test instruments used for this study was crucial to the value that could be placed on the findings. Since there is no data available for the Pretest and Posttest I and since Posttest II was an entirely new test, particular attention has to be given to the reliability and validity of the test instruments. The reliability measures for all of the tests will be determined by the Cronback's alpha formula which is a split-half correlation. The validity of the tests is primary (direct) in nature, and, therefore, not determined by statistical measures.

Analysis of Test Results

Since randomization of the groups was not possible, the Pretest was employed to determine if the participating groups were sufficiently alike to accept any subsequent test differences as being attributable to certain specific stimuli for learning. If the groups were found to be dissimilar, compensation could be made when evaluating later data. The data from the pretest will be subjected to a one-way analysis of variance, a two-way analysis of variance considering year in college, and a multiple classification analysis considering course grade and year in college.
To determine the acceptability of the hypothesis that those who participate in the game will perform better than the non-gamers, an analysis of variance was employed to assess the significance of the difference between the percentage mean of the combined experimental groups and Control I on Posttest I. The percentage mean will be obtained by computing the scores of each test on a percentage basis and then utilizing those to determine the group mean. Control II and Control III will be excluded from consideration as part of the non-game group because their treatments were minimal and it was anticipated that they would influence the results in such a manner as to favor the game groups.

The hypothesis which dealt with the adaptation of the game and the relationship of that activity to performance on Posttest I will be tested by the use of an analysis of variance among the respective percentage means of Posttest I. In this case, the experimental groups will not be combined as was true for the previous hypothesis.

The third hypothesis involves a question of retention and suggests that differences would exist among the three primary research groups with respect to their performances on Posttest II with an interval of over two months from the last formal experience with the content in question. This hypothesis will be tested with both an analysis of variance and an analysis of covariance.
CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

The primary purpose of this study was to determine the influence of the non-simulation game Propaganda on the learning of certain techniques used in the advertising of products. Since the study was a pilot study, it also served to initiate the development of valid and reliable evaluation instruments.

The subjects for the study were 224 students in the introductory personal health course at the Eastern Michigan University during the Fall term of 1974. These students were divided into five separate treatment groups and subjected to the treatments as a part of the regular course proceedings.

The research was essentially a non-equivalent control group design for dealing with the primary research questions with a static group comparison design being used for secondary issues. The primary research questions were those dealing with the differential impacts of selected treatment programs on learning and retention; the secondary questions were related to the effects of elements common to the groups involved in the primary treatment programs.
The design model, originally presented in Chapter III is repeated here in Figure 2.

<table>
<thead>
<tr>
<th>Design Model</th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest I</th>
<th>Posttest II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>0</td>
<td>X₂</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Non-equivalent Control Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental II</td>
<td>0</td>
<td>X₃</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Control I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-shot Case Study Design</td>
<td></td>
<td></td>
<td>X₄</td>
<td>0</td>
</tr>
<tr>
<td>Control II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-group Pretest-Posttest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control III</td>
<td>0</td>
<td>X₅</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

0 = Assessments
X = Treatments

Figure 2

The Basic Research Design

The computer program for the study was selected from the **Statistical Package for the Social Sciences (SPSS)**. For the questions dealing with test reliability, a correlation statistic was employed. The questions regarding comparative changes among the research groups were tested with analyses of variance and multiple classification analyses. This latter treatment is a program for isolating the effect of a given variable when other factors are controlled. Since
this was a pilot study, where pertinent, all data was accepted at the .05 level of confidence.

In this chapter, the data will be analyzed according to the sub-purposes and the hypotheses of the study. The following are the major areas of concern:

1. test validity and reliability
2. determining group homogeneity
3. analysis of the data collected to test the hypotheses.
4. assessment of the learning impact of the Pretest and the Techniques Sheet.
5. feedback from the faculty.
6. student attitudes toward the use of the game for learning.

TEST VALIDITY AND RELIABILITY

The data for test reliability will be analyzed with the use of Cronbach's alpha, one of the most widely used reliability coefficients, which is equivalent to the Kuder-Richardson Formula 20. Cronbach describes it as follows:

A general formula (α), of which a special case is the Kuder-Richardson coefficient of equivalence, is shown to be the mean of all split-half coefficients resulting from different splittings of a test. Alpha is therefore an estimate of the correlation between two random samples of items from a universe of items like those in the test.¹

The Pretest items were obtained from a collection of items used for the National Academic Games Olympics. In addition, they were items which had been created by the author of the book which served as a basis for the game Propaganda. These two factors appear to give the instrument face validity. Further, it has some elements of curricular validity in that the items represent examples of each of the "techniques of irrelevance," which are the focus of the instructional endeavors. The reliability coefficient (alpha) for the Pretest is .84.

The alpha for the Pretest is for the entire research population (224 cases), despite the fact that Control II did not take the Pretest, per se. As stated previously, Control II was given Posttest I (the same test as the Pretest), but received no instruction pertinent to the topic being dealt with in the research. Since this group had had no previous exposure to the test, Control II Posttest I scores were included in the reliability computations.

The Pretest was presented in a format which made it fairly easy to guess the right answer. The subjects, not having been previously exposed to the "techniques of irrelevance," were given a list of the techniques along with the test items. Most of the names of the techniques, (e.g. appearance, slogans, and technical jargon), were self-explanatory and the task of matching the technique to its
example(s) was simple. Despite this, the mean score was 6.8 out of a possible eleven.

Posttest I

Posttest I, was the same test that was given as the pretest. The intervening treatments necessitated their being considered separately, however. The alpha (reliability coefficient) for Posttest I is .90. This represents an increase of .06 over the alpha for the pretest. In reviewing the data on Posttest I, it can be noted that the information includes the scores of Control II. This group had not had the benefit of a previous exposure to the test. For this reason, Cronbach's alpha was computed a second time for Posttest I, this time excluding the Control II group. This had minimal effect on the reliability coefficient. The change in the figures was negligible with alpha being .91.

The reliabilities of both the Pretest and Posttest I are within acceptable ranges. Thorndike reports that the minimum acceptable test reliability for evaluating the level of group accomplishment for a single performance is .50.\(^2\) Scott and French suggest that reliability coefficients above .85 should be considered excellent.\(^3\)


The reliability of the Pretest could be enhanced by increasing the number of items. This may also apply to Posttest I and seems the most viable of the usual suggestions for increasing test reliability. Other measures such as increasing item homogeneity and item discrimination, and decreasing the range of item difficulty do not appear as potentially useful in that these areas do not seem to represent problems. Test length is an obvious problem and should be given consideration priority.

Posttest II

Posttest II was designed from ads designed to sell health-related products. The items (ads) selected were those which represented the "techniques of irrelevance" which were used in the game. The test was validated by a jury which consisted of those faculty who were involved in the use of the game Propaganda in this research project. It was assumed their familiarity with the "techniques of irrelevance" would enable them to be good judges of the ads and of the techniques represented by them. Such a validating procedure helps determine the direct validity of the test. Since the test items provided at least one example of each of the "techniques of irrelevance," there is some degree of content validity.

The reliability coefficient for Posttest II shows an alpha of .88. As with the previous tests, these
represent acceptable figures, particularly for tests which have yet to be refined. Further, test length may continue to be a factor, despite the fact that Posttest II contains ten more items than either the Pretest or Posttest I.

THE PRETEST AS A MEASURE OF GROUP HOMOGENEITY

In establishing the sample population for the research, it was not possible to assure that the groups would be homogeneous. It was presumed that a certain amount of random distribution would occur through the process of registration for the course; however, such factors as time of class meeting and instructor were areas where choice could lead to less than a random sample.

The comparability of the research groups was assessed through the use of an analysis of variance of the group means of the Pretest (based on the percent of items correct). Table 4.1 shows the group means and standard deviations and Table 4.2 gives the data on the analysis of variance.

It should be noted again that Control II did not participate in the Pretest at the same time as the other groups. Control II's initial exposure to the Pretest came at the time that the other groups were taking the test for the second time as Posttest I. The mean for the Control II group for its first exposure to the pretest was 65.4 which is only slightly below the average mean for all groups. With this information, it is concluded that the groups
involved in the research were not significantly different from each other.

TABLE 4.1

PRETEST - MEANS AND STANDARD DEVIATIONS
BY GROUP

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>69.60</td>
<td>19.41</td>
<td>52</td>
</tr>
<tr>
<td>Experimental II</td>
<td>61.55</td>
<td>19.06</td>
<td>63</td>
</tr>
<tr>
<td>Control I</td>
<td>68.22</td>
<td>15.59</td>
<td>48</td>
</tr>
<tr>
<td>Control II</td>
<td>65.40</td>
<td>16.71</td>
<td>21</td>
</tr>
<tr>
<td>Control III</td>
<td>62.28</td>
<td>16.74</td>
<td>28</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>65.51</strong></td>
<td><strong>16.74</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

A simple comparison of the means of the three primary research groups (Experimental I and II and Control I)
indicates a discrepancy which seems to require further attention. In order to determine if the mean differences were significant for these groups, an analysis of variance was computed excluding the Control II and III scores. Table 4.3 presents a summary of that analysis which reveals that the differences in the means on the Pretest for the primary research groups are significant.

TABLE 4.3

ANALYSIS OF VARIANCE OF PRETEST MEANS FOR PRIMARY RESEARCH GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2155.83</td>
<td>2</td>
<td>1077.91</td>
<td>3.24*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>53180.88</td>
<td>160</td>
<td>332.38</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>55336.71</td>
<td>162</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

Since the analysis of variance indicated that the differences among the Pretest means for the primary research groups were significant, the next step was to attempt to determine if the cause of the difference could be discovered. There was little available information that could be used for this purpose. Course grades were compared, but these measures could reveal no reliable information since there were five instructors working independently of each other with complete freedom to establish their own grading.
standards. Year in college appeared to more closely relate to the average means of the groups. Table 4.4 provides an overview of course grade and year by group as they compare with Pretest means. (Control II and III are included for comparison.)

To verify that course grade was not a significant variable in explaining the differences among the Pretest means for the primary research groups, a two-way analysis of variance was computed with grade as a covariate. The differences with course grade considered are not significant, but the differences when group is considered continue to be significant at the .05 level. A summary of this analysis of variance is presented in Table 4.5.

In Table 4.4, the average year in college for each group is reported. Simple comparison of these averages with the Pretest mean seems to indicate a possibility that year in college was more closely correlated with test performance than was course grade. An analysis of variance with year in college as a covariate was performed with the results indicating that for the primary research groups there is no significant difference among these three groups when year is taken into consideration. See Table 4.6 for the data on this analysis of variance.

An ANOVA with year in college as a covariate was applied to the means for all five groups which took the Pretest and, again, the differences among the groups were found to be not significant. See Table 4.7.
### TABLE 4.4

COURSE GRADE AND YEAR BY GROUP

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Group Average (A=4.0)</th>
<th>Year</th>
<th>% Aver. Pretest</th>
<th>Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 4</td>
<td>Fr. 24 44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 20</td>
<td>So. 4 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N* 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Experimental I**

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Group Average (A=4.0)</th>
<th>Year</th>
<th>% Aver. Pretest</th>
<th>Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 11</td>
<td>Fr. 34 51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 31</td>
<td>So. 14 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 15</td>
<td>Jr. 6 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X* 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Experimental II**

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Group Average (A=4.0)</th>
<th>Year</th>
<th>% Aver. Pretest</th>
<th>Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 17</td>
<td>Fr. 9 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 21</td>
<td>So. 7 14</td>
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<td></td>
</tr>
<tr>
<td>C 7</td>
<td>Jr. 14 28</td>
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<tr>
<td>D 1</td>
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</tr>
<tr>
<td>E 1</td>
<td></td>
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</tr>
<tr>
<td>W 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Control I**

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Group Average (A=4.0)</th>
<th>Year</th>
<th>% Aver. Pretest</th>
<th>Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 14</td>
<td>Fr. 15 57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 8</td>
<td>So. 4 15</td>
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<td></td>
</tr>
<tr>
<td>C 2</td>
<td>Jr. 3 11</td>
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<tr>
<td>D 0</td>
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<tr>
<td>E 1</td>
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<tr>
<td>W 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Control II**

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Group Average (A=4.0)</th>
<th>Year</th>
<th>% Aver. Pretest</th>
<th>Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 6</td>
<td>Fr. 13 44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 7</td>
<td>So. 6 20</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>C 13</td>
<td>Jr. 4 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 1</td>
<td></td>
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</tr>
<tr>
<td>W 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Control III**

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Group Average (A=4.0)</th>
<th>Year</th>
<th>% Aver. Pretest</th>
<th>Pretest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 6</td>
<td>Fr. 13 44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 7</td>
<td>So. 6 20</td>
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<td></td>
</tr>
<tr>
<td>C 13</td>
<td>Jr. 4 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 4.5

**ANALYSIS OF VARIANCE WITH GRADE FOR PRETEST MEANS OF PRIMARY RESEARCH GROUPS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-Grade</td>
<td>671.73</td>
<td>1</td>
<td>671.73</td>
<td>2.38</td>
</tr>
<tr>
<td>Main Effects - Group</td>
<td>2101.49</td>
<td>2</td>
<td>1050.72</td>
<td>3.72*</td>
</tr>
<tr>
<td>Residual</td>
<td>38660.15</td>
<td>137</td>
<td>282.19</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

### TABLE 4.6

**ANALYSIS OF VARIANCE WITH YEAR AS COVARIATE FOR PRIMARY RESEARCH GROUPS FOR THE PRETEST**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-year</td>
<td>640.37</td>
<td>1</td>
<td>640.37</td>
<td>2.28</td>
</tr>
<tr>
<td>Main effects - group</td>
<td>1102.87</td>
<td>2</td>
<td>551.435</td>
<td>1.96</td>
</tr>
<tr>
<td>Residual</td>
<td>29492.14</td>
<td>105</td>
<td>280.87</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>31235.39</td>
<td>108</td>
<td>289.27</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 4.7

ANALYSIS OF VARIANCE WITH YEAR AS COVARIATE FOR ALL GROUPS IN PRETEST

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-year</td>
<td>462.00</td>
<td>1</td>
<td>462.00</td>
<td>1.44</td>
</tr>
<tr>
<td>Main effects-group</td>
<td>2511.28</td>
<td>4</td>
<td>627.82</td>
<td>1.96</td>
</tr>
<tr>
<td>Residual</td>
<td>65863.40</td>
<td>206</td>
<td>319.72</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>68836.68</td>
<td>211</td>
<td>326.24</td>
<td></td>
</tr>
</tbody>
</table>

Similarly, analysis of variance with year in college as a covariate was applied to the Posttest I and the Posttest II scores for the primary research groups. Throughout, there was no significant difference among the primary research groups when year in college was considered. Though it is possible that there were other factors which were not identified which were influential in the initial differences among the groups, consideration of year in college does reduce these differences. This factor will be considered in further comparisons of group performances.

Since one of the hypotheses dealt with the combined experimental groups as compared with Control I, it was also of interest to determine the comparability of the groups in that configuration. An analysis of variance was performed and the differences between the groups were found to be not
significant at the .05 level. Table 4.8 exhibits the data for this analysis of variance.

TABLE 4.8

ANALYSIS OF VARIANCE OF PRETEST SCORES FOR COMBINED EXPERIMENTAL GROUPS AND CONTROL I

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>358.97</td>
<td>1</td>
<td>358.97</td>
</tr>
<tr>
<td>Within Groups</td>
<td>31177.94</td>
<td>132</td>
<td>236.19</td>
</tr>
<tr>
<td>Total</td>
<td>31536.91</td>
<td>133</td>
<td></td>
</tr>
</tbody>
</table>

TESTING THE HYPOTHESES--ANALYSIS OF THE DATA

With the test results from the Pretest, Posttest I, and Posttest II, the performances of the various groups can be studied in an effort to determine the acceptability of the study's three hypotheses. Table 4.9 summarized the basic data for each of the assessment instruments by research group.

Hypothesis I--The Game Versus the Inquiry Method

The first hypothesis states that those subjects who play the "techniques of irrelevance" section of the game Propaganda will be more successful in recognizing examples of these techniques on Posttest I than the subjects who do not participate in the game. In determining if this
<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest I</th>
<th>Posttest II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Mean</td>
<td>Standard Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Entire Population</td>
<td>65.52</td>
<td>18.24</td>
<td>191</td>
</tr>
<tr>
<td>Experimental I</td>
<td>69.61</td>
<td>19.41</td>
<td>52</td>
</tr>
<tr>
<td>Experimental II</td>
<td>61.56</td>
<td>19.06</td>
<td>63</td>
</tr>
<tr>
<td>Control I</td>
<td>68.23</td>
<td>15.59</td>
<td>48</td>
</tr>
<tr>
<td>Control II (65.41 16.71 65.41 16.71 21)</td>
<td>65.41</td>
<td>16.71</td>
<td>21</td>
</tr>
<tr>
<td>Control III</td>
<td>62.29</td>
<td>16.74</td>
<td>28</td>
</tr>
<tr>
<td>Experimental I and II combined.</td>
<td>65.19</td>
<td>19.55</td>
<td>115</td>
</tr>
</tbody>
</table>
hypothesis could be supported, the data for Experimental I and II were combined, since both of these groups were involved in game participation, and compared with the data from Control I.

An analysis of variance with year as the covariate was applied to the Posttest I scores to determine if the differences in those scores were significant. This statistical treatment resulted in an F of .56 for the covariate and 1.50 for the main effects neither of which are significant of the .05 level. Table 4.10 provides an overview of this information.

**Table 4.10**

ANOVA WITH YEAR AS COVARIATE FOR POSTTEST I FOR COMBINED EXPERIMENTAL I AND II AND CONTROL I

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-Year</td>
<td>89.59</td>
<td>1</td>
<td>89.58</td>
<td>.56</td>
</tr>
<tr>
<td>Main Effects-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>475.76</td>
<td>2</td>
<td>237.88</td>
<td>1.50</td>
</tr>
<tr>
<td>Residual</td>
<td>16652.35</td>
<td>105</td>
<td>158.59</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17217.70</td>
<td>108</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From this data, it can be determined that when the scores of Posttest I are considered independently with year in college as a covariate, the difference among the groups are not significant. The change from Pretest scores to
Posttest I scores is a more important figure than is Posttest I alone, however. An analysis of variance with year in college as a covariate was applied to the percentage point difference between Pretest and Posttest I for the combined Experimental I and II and the Control I. (See Table 4.11 for the basic figures on these differences.) The analysis of variance with year as covariate produced an F of 6.89 for the covariate which is significant at the .05 level and an F of .44 for the main effects (group) which is not significant when adjusted for year. Table 4.12 displays the data for this ANOVA.

**TABLE 4.11**

PERCENTAGE POINT DIFFERENCES FROM PRETEST TO POSTTEST SCORES FOR PRIMARY RESEARCH GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Mean (difference)</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire Population</td>
<td>18.15</td>
<td>16.72</td>
<td>143</td>
</tr>
<tr>
<td>Experimental I</td>
<td>16.71</td>
<td>16.24</td>
<td>43</td>
</tr>
<tr>
<td>Experimental II</td>
<td>19.59</td>
<td>16.68</td>
<td>54</td>
</tr>
<tr>
<td>Control I</td>
<td>17.80</td>
<td>17.42</td>
<td>46</td>
</tr>
<tr>
<td>Experimental I &amp; II</td>
<td>18.31</td>
<td>16.47</td>
<td>97</td>
</tr>
</tbody>
</table>

An additional analysis of variance was performed with the Pretest/Posttest I differences for the combined experimental groups, Control I, and Control III, controlling for year in college. Again the significance of the differences was verified, however, year in college ceases to be the source of variance in this second ANOVA and instead,
TABLE 4.12

ANOVA WITH YEAR AS COVARIATE FOR PRETEST/POSTTEST DIFFERENCES--COMBINED EXPERIMENTAL I AND II AND CONTROL I

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-year</td>
<td>1863.86</td>
<td>1</td>
<td>1863.85</td>
<td>6.89*</td>
</tr>
<tr>
<td>Main effects Group</td>
<td>120.30</td>
<td>1</td>
<td>120.30</td>
<td>.44</td>
</tr>
<tr>
<td>Residual</td>
<td>37314.50</td>
<td>138</td>
<td>270.39</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>39298.66</td>
<td>140</td>
<td>280.70</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

group membership becomes the significant factor. This data is reported in Table 4.13. A multiple classification analysis of the data reveals that Control III does not conform to the trends established by the primary research groups. This would be expected since Control III did not benefit from the more extensive instructional opportunities afforded Experimental I and II and Control I. (The multiple classification analysis is reported in Table 4.14.)

A further analysis of the differences between groups for the Pretest/Posttest I differential was accomplished through a Multiple Classification Analysis. In this treatment, the covariate is taken into account and the means are adjusted accordingly. When year in college is considered,
TABLE 4.13

ANOVA WITH YEAR AS COVARIATE FOR PRETEST/POSTTEST I DIFFERENCES—COMBINED EXPERIMENTAL I AND II AND CONTROL I AND CONTROL III

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-year</td>
<td>688.73</td>
<td>1</td>
<td>688.73</td>
<td>2.51</td>
</tr>
<tr>
<td>Main effects-group</td>
<td>2826.04</td>
<td>2</td>
<td>1413.02</td>
<td>5.16*</td>
</tr>
<tr>
<td>Residual</td>
<td>42412.68</td>
<td>155</td>
<td>273.63</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>45927.46</td>
<td>158</td>
<td>290.68</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

TABLE 4.14

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST/POSTTEST I DIFFERENCES FOR COMBINED EXPERIMENTAL GROUPS AND CONTROL I AND CONTROL III

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted Deviation from Grand Mean</th>
<th>Deviation from Grand Mean Adjusted for Year in College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I and II</td>
<td>1.62 (18.42)</td>
<td>1.11 (17.91)</td>
</tr>
<tr>
<td>Control I</td>
<td>1.00 (17.80)</td>
<td>2.32 (19.12)</td>
</tr>
<tr>
<td>Control III</td>
<td>-11.10 (5.70)</td>
<td>-11.81 (4.99)</td>
</tr>
</tbody>
</table>

Grand Mean = 16.80
Multiple r squared = .07
it is revealed that the experimental groups' deviation from the grand mean decreases and the Control I increases creating an inversion of the original ranking. However, the amount of variance explained by the variable is small (multiple classification r squared = .05). The data from the multiple classification analysis is recorded in Table 4.15.

**TABLE 4.15**

MULTIPLE CLASSIFICATION ANALYSIS FOR PRETEST/POSTTEST I DIFFERENCES FOR COMBINED EXPERIMENTAL GROUPS AND CONTROL I

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted Deviation from Grand Mean</th>
<th>Deviation from Grand Mean Adjusted for Year in College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I and II</td>
<td>0.20 (18.41)</td>
<td>-0.68 (17.53)</td>
</tr>
<tr>
<td>Control I</td>
<td>-0.42 (17.79)</td>
<td>1.40 (19.61)</td>
</tr>
</tbody>
</table>

Grand Mean = 18.12
Multiple r squared = .05

The findings regarding the first hypothesis may be summarized as follows:

1. The analysis of variance for Posttest I only for the combined experimental groups and Control I with year in college as a covariate, revealed that the differences between the mean scores for these two groups were not significant at the .05 level.
2. The analysis of variance for the differences in the Pretest/Posttest I means for the combined experimental groups and Control I with year as the covariate indicated that year in college is significant, and that when the scores are adjusted for year, the differences between the groups are not significant.

3. The multiple classification analysis showed that when the deviation from the grand mean is adjusted for year in college that the Control I differences in the mean were greater than the combined experimental groups', that these differences were significant and that the amount of difference explained by the single covariate is small.

With the accumulated evidence, the first hypothesis is rejected. When the differences between the means from Pretest to Posttest I were evaluated (with the year in college,) the differences were found to be significant, and Control I exhibited the greatest gain. Those who played the game did not demonstrate as great success, as measured by the tests, as did those involved in the non-game, inquiry method of learning.

Hypothesis II—Game Adaptation and Short-Term Learning Gains

The second hypothesis states that those subjects who adapt the game will be more successful on Posttest I than those who only play the game or those not involved in game play (but did receive instruction). Unlike the previous hypothesis, the three primary research groups are now
considered independently. An analysis of variance with year as covariate was calculated for the differences from Pretest to Posttest I. From this it was determined that year in college is significant in the Pretest/Posttest I differences among the Experimental I, Experimental II, and Control I groups. When the differences are analyzed, with year accounted for, they are no longer significant. See Table 4.16.

TABLE 4.16

ANOVA WITH YEAR AS COVARIATE FOR PRETEST/POSTTEST I DIFFERENCES AMONG EXPERIMENTAL I, EXPERIMENTAL II, AND CONTROL I

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-year</td>
<td>1209.01</td>
<td>1</td>
<td>1209.01</td>
</tr>
<tr>
<td>Main Effects- group</td>
<td>130.63</td>
<td>2</td>
<td>65.31</td>
</tr>
<tr>
<td>Residual</td>
<td>28065.95</td>
<td>105</td>
<td>267.29</td>
</tr>
<tr>
<td>Total</td>
<td>29405.59</td>
<td>108</td>
<td>272.27</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

Since year in college appeared to have an influence on the outcome of the tests, a multiple classification analysis was computed to determine what the deviation from the grand mean actually was and what it would have been had year not been influential. (These means differ from
those reported in Table 4.14 because missing information for 34 subjects required their elimination from consideration at this point.) The multiple r squared for this analysis indicates the amount of variance in the scores which is explained by the variable year. The multiple r squared is .05 as compared with .005 when no variable is taken into consideration. Table 4.17 displays the comparative unadjusted and adjusted mean differences for the primary research groups.

TABLE 4.17

MULTIPLE CLASSIFICATION ANALYSIS FOR THE INDEPENDENT PRIMARY RESEARCH GROUPS--PRETEST/POSTTEST I

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted Deviation from Grand Mean</th>
<th>Deviation from Grand Mean Adjusted for Year in College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>-1.87 (18.74)</td>
<td>-1.59 (19.02)</td>
</tr>
<tr>
<td>Experimental II</td>
<td>2.11 (22.74)</td>
<td>0.79 (21.40)</td>
</tr>
<tr>
<td>Control I</td>
<td>-0.64 (19.97)</td>
<td>0.71 (21.32)</td>
</tr>
</tbody>
</table>

Grand Mean = 20.61
Multiple r squared = .05

The findings regarding the second hypothesis indicate that is is rejected: those who adapted the game were no more successful on Posttest I than those who either played the game or those not involved in game play. The analysis of variance showed that the differences of the means from Pretest to Posttest I were not significant from group to
group when they were adjusted for year. A comparison of the adjusted means shows that the Experimental I group which participated in the adaptation exercise actually had the poorest gain of the three groups.

**Hypothesis III—Game Adaptation and Learning Retention**

The third hypothesis is concerned with the issue of retention of knowledge gains over a nine week time span. It was hypothesized that the various research treatments would significantly influence the students' ability to retain knowledge of the "techniques of irrelevance." A comparison of the percentage means for Posttest I and Posttest II reveals a considerable decrease in scores. (See Table 4.18).

**TABLE 4.18**

PERCENTAGE MEAN SCORES FOR POSTTEST I AND POSTTEST II FOR THE PRIMARY RESEARCH GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest I % Mean</th>
<th>Posttest II % Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>88.64</td>
<td>58.11</td>
</tr>
<tr>
<td>Experimental II</td>
<td>82.97</td>
<td>49.47</td>
</tr>
<tr>
<td>Control I</td>
<td>86.25</td>
<td>52.70</td>
</tr>
</tbody>
</table>
An analysis of variance with year as the covariate for the Posttest II scores by primary research group was calculated. The differences among the mean scores for Posttest II were found to be not significant when adjusted for year. Table 4.19 displays this data.

**TABLE 4.19**

ANOVA WITH YEAR AS COVARIATE FOR POSTTEST II FOR THE PRIMARY RESEARCH GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariate-year</td>
<td>11.31</td>
<td>1</td>
<td>11.31</td>
<td>.04</td>
</tr>
<tr>
<td>Main effects-group</td>
<td>653.97</td>
<td>2</td>
<td>326.98</td>
<td>1.40</td>
</tr>
<tr>
<td>Residual</td>
<td>24442.24</td>
<td>105</td>
<td>232.78</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25107.52</td>
<td>108</td>
<td>232.47</td>
<td></td>
</tr>
</tbody>
</table>

A multiple classification analysis was carried out for Posttest II with year as a variable. This statistic indicated that year in college did not influence the Posttest II outcomes. The means when adjusted for year, remained virtually unchanged. See Table 4.20.

To establish a further analysis of the Posttest II scores, scattergrams were constructed comparing Posttest I and Posttest II scores. The scattergram presents a visualization of the amount of change from Posttest I to Posttest II. It can be used in analyzing the data for this hypothesis since year in college has proved to be not significant
TABLE 4.20
MULTIPLE CLASSIFICATION ANALYSIS WITH YEAR AS COVARIATE FOR POSTTEST II

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted Deviation from Grand Mean</th>
<th>Deviation from Grand Mean Adjusted for Year in College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>3.51 (57.02)</td>
<td>3.51 (51.02)</td>
</tr>
<tr>
<td>Experimental II</td>
<td>-2.24 (50.85)</td>
<td>-2.23 (50.86)</td>
</tr>
<tr>
<td>Control I</td>
<td>-0.94 (52.15)</td>
<td>-0.95 (52.14)</td>
</tr>
</tbody>
</table>

Grand Mean = 53.09
Multiple r squared = .02

in this case. (Since a scattergram does not account for the influence of independent variables, this technique could not be used where such variables proved significant.)

The scattergram slopes for each group were: Experimental I = .06; Experimental II = .40; Control I = .16. (See Figure 3 for a comparison of these slopes.) The greater the slope, the greater the change from one test to the other. From the slopes, then, it appears that Experimental II experienced a regression in percentage scores from Posttest I to Posttest II, achieving the greatest change must be construed as undesirable. In this perspective, Experimental I appears to have experienced the least change from Posttest I to Posttest II. Table 4.21 presents the scattergram statistics for Posttest I/Posttest II.
Figure 3

Comparative Scattergram Slopes for Differences

From Posttest I to Posttest II by Group
TABLE 4.21

SCATTERGRAM STATISTICS FOR POSTTEST I/POSTTEST II

BY GROUP

<table>
<thead>
<tr>
<th></th>
<th>Exp. I</th>
<th>Exp. II</th>
<th>Control I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>.09</td>
<td>.37</td>
<td>.21</td>
</tr>
<tr>
<td>r Squared</td>
<td>.008</td>
<td>.14</td>
<td>.04</td>
</tr>
<tr>
<td>Significance of r</td>
<td>.29</td>
<td>.006</td>
<td>.11</td>
</tr>
<tr>
<td>Std. error of est.</td>
<td>10</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Intercept</td>
<td>87</td>
<td>64</td>
<td>77</td>
</tr>
<tr>
<td>Slope</td>
<td>.06</td>
<td>.40</td>
<td>.16</td>
</tr>
<tr>
<td>Plotted value</td>
<td>36</td>
<td>43</td>
<td>34</td>
</tr>
</tbody>
</table>
The data presented through the scattergrams indicates that those who were involved in the adaptation of the game have exhibited greater retention than the other research groups. The performances of both Experimental I and Control I seem to point toward a possible assumption that involvement in creating or in seeking out advertisements which represented the "techniques of irrelevance" may have had a positive influence on the students' abilities to retain that which was learned. It cannot be overlooked, however, that the year in college may have worked against the Experimental II subjects. The more advanced student's powers of retention may have been more strongly developed.

The third hypothesis proposed that the ability to retain the knowledge of the "techniques of irrelevance" would be influenced by the various research treatments. An analysis of variance with year in college as the covariate indicated that in this case, year in college was not a significant factor. The differences among the groups for the mean scores on Posttest II were not significant. In light of this information, the findings indicate that the hypothesis would be rejected; however, since year in school was not an important factor, the scattergram slopes become useful. Since these figures favor the groups which experienced the greater
involvement with the "techniques of irrelevance," the hypothesis is partially accepted. There is no significant difference among Posttest II mean scores, but the losses from Posttest I to Posttest II were smallest for those who adapted the game and greatest for those who only played it.

LEARNING IMPACT OF PRETEST AND TECHNIQUES SHEET

One of the sub-purposes of this study was to identify the extent of learning that occurs as a result of elements common to the treatments of the primary research groups—the Pretest and Techniques Sheet.

The Pretest

Control II and Control III served to help determine the effect on learning of the Pretest and the Techniques Sheet. Control II was given the Pretest at the same time that all other groups were taking the same test as Posttest I. This group had received no instruction related to the "techniques of irrelevance" prior to this test and received
none following. It was given the Posttest II at the same time as the other groups. The mean score of the initial exposure to the Pretest (Posttest I) for Control II was 65.40 which is favorably comparable to the average mean of 65.53 for the other groups in their first exposure to the test. The Posttest II mean score for Control II was 40.50. From this information, it would appear that some learning did take place as a result of the Pretest. Since Posttest II required recall of the names of the various techniques of irrelevance, it would be expected that had no learning taken place, the scores for Posttest II would have been much closer to Zero. Of course, other factors such as previous learning or guessing have not been considered and should be investigated as Posttest II is refined.

The Techniques Sheet

Control III followed the same testing pattern as did the three primary research groups. Between the Pretest and Posttest I, this group received the Techniques Sheet and were instructed to read it. This was the extent of their involvement with this instructional item. The Control III mean score for the Pretest was 62.65 and 69.14 for Posttest I. (These figures vary somewhat from those reported earlier with the data on the Pretest and Posttest I because these scores reflect only those cases for which both Pretest and Posttest I were available.) A t-test of the Pretest/Posttest I scores reveals a t value of 1.93
which is not significant at the .05 level. It would therefore appear that the Techniques Sheet does not play an important role in the learning which occurred. Table 4.22 provides the data related to this $t$-test.

A comparison of Posttest I and Posttest II scores for Control III do not conform to expectations. Since the gain from Pretest to Posttest I was small and not significant, it would be expected that Posttest II performance would be similar to that of Control II. This was not the case, however. In fact Control III experienced the lowest percentage decrease in scores of any group, and had a Posttest II mean score (50.84) which exceeded that of Experimental II. Table 4.23 shows a comparison of mean scores by group for Posttest I and Posttest II and the percentage decrease for each group.

There is no clearly identifiable reason for the performance of Control III on Posttest II. The average course grade for this group ranked second to the lowest; the average year in college was the lowest, the average age was second to the lowest. It would be expected that the greater each of these factors become, the better the performance on the test.

THE GAME AS A TEACHING METHODOLOGY

The faculty who participated in the gaming element of this research project were asked to provide their observations, perceptions, and suggestions with regard to
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>Difference Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>t Value</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>62.65</td>
<td>16.95</td>
<td>3.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttest I</td>
<td>69.14</td>
<td>19.93</td>
<td>4.45</td>
<td>6.49</td>
<td>15.01</td>
<td>3.35</td>
<td>1.93</td>
<td>19</td>
</tr>
</tbody>
</table>
### TABLE 4.23

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest I-Percentage Mean Scores</th>
<th>Posttest II-Percentage Mean Scores</th>
<th>Percent Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental I</td>
<td>88.64</td>
<td>58.11</td>
<td>.34</td>
</tr>
<tr>
<td>Experimental II</td>
<td>82.97</td>
<td>49.47</td>
<td>.40</td>
</tr>
<tr>
<td>Control I</td>
<td>86.25</td>
<td>52.70</td>
<td>.38</td>
</tr>
<tr>
<td>Control II</td>
<td>65.40</td>
<td>40.50</td>
<td>.38</td>
</tr>
<tr>
<td>Control III</td>
<td>69.31</td>
<td>50.84</td>
<td>.26</td>
</tr>
</tbody>
</table>

the way in which the game *Propaganda* was used as part of their instructional program. To obtain this information, four broad questions were posed for the faculty members:

1. What were your feelings about the use of a game in your course and what could have been done to have helped you more?

2. What were your student's reactions to the use of a game for learning?

3. If you were to use the game *Propaganda* again, what changes would you make?

4. Would you consider using other games in your classroom?

The responses to the first question indicated that initially the faculty members were skeptical about how the students would respond. Having had no previous
experience with the classroom administration of instructional games, there was a certain amount of apprehension about being able to handle the method smoothly. Though they had had an opportunity to play through the game and to study the "techniques of irrelevance," it was generally agreed that they needed more game play experiences to become familiar with the variety of situations which might arise during the operation of the game. It was further agreed that the faculty member should have a sound understanding of the "techniques of irrelevance" prior to using the game Propaganda with students.

There was some discomfort with the use of a technique which had an open-ended nature. It may be recalled that in playing the game there were no clearly right or clearly wrong answers. The "right" answer was that which was chosen by group consensus. The faculty members as well as the students did not enjoy this facet of the game.

The second question involved the faculty members' observations of the students' reactions to the use of a game for learning. It was observed that once the students caught on to the purpose and the rules, their attitudes toward the game were generally positive. As was mentioned previously, there was some dissatisfaction with the open-ended nature of the game. The one "technique of irrelevance" which the students found the most difficult with the "sophisticated formula" and not being able to clearly understand it, some concluded that the examples of this one were those
which were the longest! The instructor for the Experimental II classes observed that one of his groups was not at all game oriented and that this group would have preferred to have received lectures on those days in which the game was played. On the other hand, one of the Experimental I groups complained that there was not sufficient competition afforded them when it came to the exchange of the class-created examples with the other Experimental I group. Their preference would have been for head-to-head competition between the two classes.

In answer to the third question—what changes should be made?—there was a wide range of suggestions. One dealt with a mechanical problem with the game pieces being difficult to manage. The score sheets (Clear Thinking Charts) were duplicated on paper but required a more substantial thickness. The playing tokens were large, colored sequins. They, too, should have had more weight to them to have been more easily managed by the players.

The greatest number of suggestions for change were those concerned with timing. The instructor for the Experimental II classes felt that three days of play was too much. Though the classes used only a portion of each class period for game play, it was suggested that this be reduced to one or perhaps two days—whatever would be necessary to provide each student an opportunity to play through all of the examples of the "techniques of irrelevance." By dividing the playing experiences into one episode per day for three
days, momentum and interest were impeded. Another suggestion was to expand the number of techniques to be learned rather than reduce the number of playing days.

A similar problem evolved with the students in the Experimental I groups with regard to being prohibited from establishing a winner or winners in game play because their playing time was interrupted to develop their own examples of the "techniques of irrelevance."

The final question presented to the faculty members concerned their receptiveness to gaming as an instructional technique. It was agreed that such a technique provided a good change of pace from the usual classroom routine. The comment was made that it would be nice to have several different games in hand to use when "things begin to wind down."

STUDENT ATTITUDES TOWARD THE USE OF THE GAME PROPAGANDA AS A LEARNING TOOL

The way in which educational gaming is perceived by the students would seem important in determining its usefulness as a learning tool. Further, there has been indication in the literature (see Jersen, also Lieberman) that some students may be more "playful" or game oriented than others and that this may in fact influence receptivity to games for learning. In any case, curiosity about this matter lead to the use of an attitude survey preceding and following the play of the game Propaganda. (See Appendix E.) This
was not included as a formal part of this research project because the reliability of the survey instrument had not been established and, further, such an undertaking should be a research endeavor in and of itself.

Some of the results of the attitude survey which was administered after the students had completed their play of the game Propaganda are summarized below.

- 85% liked to play educational games.
- 83% felt more educational games should be used in the classroom.
- 88% said that games make learning fun.
- 80% said that games make learning easier.
- 96% agreed that games break the monotony of the usual classroom routine.
- 84% did not feel that the game was too competitive.
- 77% felt that they had learned more about the "techniques of irrelevance" from the game than they would have from lectures.

- 44% of those who adapted the game felt they had learned more by adapting than from playing it. (On this question, 48% were neutral and 6% disagreed.)

Of particular interest is a comparison of the means of the responses from the first survey to the second. With the five response Likert scale, strongly agree was given 5 points and strongly disagree 1 point. The mean for Attitude Survey I was 2.74 (with a standard deviation of .47), and the mean for the second survey was 2.22 (standard
deviation, .41). When these two means were subjected to a t-test, the difference was found to be significant at the .01 level. Though the two surveys are not identical and there is a shift in emphasis from generalized experiences to a specific experience, the apparent shift in attitude may prove to be significant in terms of the uses of games for learning with college students.

**SUMMARY**

At the outset, this project was established as a pilot study to initiate research with the non-simulation game as a device for teaching selected techniques of advertising in a college-level health course. One facet of this task involved the acquisition or development of assessment instruments and an initial determination of their validity and reliability. The pretest and first posttest were identical tests and the items were acquired from a test used for the National Academic Games Olympics. The second posttest was derived from advertisements for health products. No indirect or statistical validity was determined for any of the tests. It was accepted that each possessed face validity, however. Each test was found to be within acceptable ranges for measure of reliability with alphas of .84 for the Pretest, .90 for Posttest I, and .88 for Posttest II.

The Pretest scores were used to determine if the students were randomly distributed among the research groups. The differences among the five groups were found not to be
significant, however, the three primary research groups were significantly different when the other groups were excluded. Course grade and year in college were considered as independent variables which might have influenced the group differences, but were found not significant for the Pretest scores. However, since year in college proved significant for Posttest I and for the Pretest/Posttest I differences, it was considered in the computations for each of the hypotheses.

The study dealt with three hypotheses. The first hypothesis suggested that the gamers and inquiry group's gains from Pretest to Posttest I would be notably different. This hypothesis was rejected. The second hypothesis speculated that the students who were involved in the adaptation of the game would demonstrate greater gains from Pretest to Posttest I than students in the other two primary research groups. This, too, was rejected. The final hypothesis theorized that retention of knowledge gained from the various treatments would be affected by those treatments. This hypothesis could not be clearly rejected in that there was evidence that treatments did make a difference and that those treatments which required the greater involvement resulted in the greater retention.

In addition to these primary research efforts, some secondary issues were considered. The learning influence of the Pretest and of the Techniques Sheet was investigated in order to determine their relative power in the learning
outcomes. From the data, it appears that both of these experiences influenced learning to some degree though not to the degree of the more extended undertakings.

The perceptions of the participating faculty were pursued. From a debriefing session, several suggestions for change were presented. The faculty in general seemed to feel that instructional games would be useful for a change of classroom pace.

Student attitudes were informally investigated. The results indicated that there was a general and enthusiastic acceptance of the game in the classroom both as a learning device and as a mechanism for breaking classroom monotony.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The primary purpose of this pilot study was to investigate the non-simulation game Propaganda as a device for teaching selected advertising techniques to college students in an introductory personal health course. Secondary purposes included determining test validity and reliability as well as identifying the learning impact of a Pretest and of the Techniques Sheet.

The research population consisted of 224 students at Eastern Michigan University, Ypsilanti, Michigan. These subjects were assigned, by course section, to one of five different research treatments. These are summarized as follows:

1. Play the game and adapt it by creating health product advertisements representing the advertising techniques being studied.
2. Play the game.
3. Learn the advertising techniques by the inquiry method of learning.
4. Learn the techniques by taking the Pretest.
5. Learn the techniques by studying a written description of them.
There was no attempt to randomize the subjects since that would have involved changes in student schedules. To determine group homogeneity, the mean percentage scores on the Pretest were subjected to an analysis of variance and the result indicated that the differences in the Pretest group scores were not significant at the .05 level of confidence. The groups were therefore accepted as being homogeneous.

The primary research issues were related to three hypotheses and involved the first three treatments as previously described. The hypotheses were concerned with the identification of learning differentials resulting from the various treatments. These hypothesis are briefly summarized as follows:

1. There will be differences in learning between the gamers and the non-gamers.

2. The subjects involved in game adaptation will show greater learning gains than those who only played the game and those involved with the inquiry method.

3. Retention of learning over an extended time period will be influenced by the method used in learning.

Secondary research issues (the sub-purposes) involved questions related to the validity and the reliability of the assessment instruments used in the research and questions concerning the learning impact of the Pretest itself and of the Techniques Sheet. Further, faculty perceptions and student attitudes were considered but not seriously investigated.
The statistical methods used to analyze the data pertinent to the hypotheses were analyses of variance, multiple classification analyses and scattergrams. Test reliability was assessed by a correlation formula.

SUMMARY OF THE FINDINGS

The evidence from this study indicated that the game Propaganda is no more productive in terms of initial learning outcomes than is the inquiry method of learning. Likewise, retention is not significantly influenced by any one method more than another. Following are the hypotheses and the findings for each.

1. Students who play the "techniques of irrelevance" section of the game Propaganda will be more accurate in labeling selected examples of these techniques than those who learn the advertising techniques by a non-game instructional method as determined by the mean scores on Posttest I.

An analysis of variance with year in college as a covariate for the Posttest I scores indicated that the differences among the groups were not statistically significant at the .05 level of confidence. Further, when the differences from Pretest to Posttest I were considered by group, with year in school as a covariate, year was found to be significant but when the test differences were adjusted for year and compared, the differences were again not significant. The multiple classification analysis revealed that when the differences from Pretest to Posttest I for each
group were adjusted for year in college the non-game (inquiry method) subjects fared better than their game counterparts.

In the final analysis, the hypothesis is rejected, concluding that the game was not superior to the inquiry method in teaching the "techniques of irrelevance."

2. Students who adapt the "techniques of irrelevance" section of the game Propaganda by providing health-related examples will be more accurate in their identification of the techniques used in the advertising of health products than those who only play the game and those who do not participate in the gaming experience as determined by scores on Posttest I.

The primary research groups were considered independently in testing this hypothesis. The analysis of variance with year in college as the covariate for the Pretest/Posttest I differences was not significant at the .05 level of confidence. As a result, the hypothesis is rejected. The process of adapting the game did not produce significantly greater learning.

3. Those subjects who were involved in the adaptation of the "techniques of irrelevance" section of the game Propaganda will exhibit greater long term retention than those who only play the game and those who do not participate in the gaming experience as determined by the scores on Posttest II.
An analysis of variance of the Posttest II scores indicated that the differences among the groups were not significant. In this case, year in college was found not to be a significant factor. Though all groups experienced a decrease in percentage means from Posttest I to Posttest II, the scattergram slopes indicate that the least change occurred for the groups which were involved in game adaptation or in learning through the inquiry method. The hypothesis was rejected, but the trend reflected by the scattergram slopes raised some questions that would merit further study.

In addition to the investigation of the hypotheses, one of the concerns of this research was to initiate the development of valid and reliable assessment instruments. The Pretest and Posttest I were identical and were comprised of items used in the Academic Games Olympics. The Posttest II was created from advertisements for health products. The instruments all reflected direct validity. The reliability for all of the tests was judged acceptable with alpha's ranging from .84 to .90.

This study also was concerned with the role of the Pretest and of the Techniques Sheet in influencing learning. Both of these factors apparently produced some learning as evidenced by test performance, but the outcome was not comparable to the results from the three primary treatments.

Two other areas which were of interest, but which were not a major part of the research effort, were faculty perceptions and student attitudes. The participating
faculty indicated an initial skepticism regarding the use of a game for learning—not because of the "play" idea, but rather because of their concerns about student response and faculty abilities to effectively direct the experience. In general, the faculty's attitude following the experiment was still one of less than overwhelming enthusiasm. (Things that are different may be slow to attract the attention of the established teacher.) Student attitudes were generally more favorable. Most students found the game an enjoyable classroom activity and supported the use of games as educational tools.

CONCLUSIONS

The following conclusions must be considered in light of the fact that this was a pilot study. The conclusions which are drawn are not to be accepted as applicable beyond the population studied.

The conclusions which may be derived from this investigation are as follows:

1. The game Propaganda has no more significant impact on the learning of the "techniques of irrelevance" than does the inquiry method of teaching.

2. Adaptation of the game Propaganda produces no more profound effects on learning than does repeated play of the game and the inquiry method.

3. Retention of knowledges attained through game adaptation is no greater than retention of knowledges
achieved through either repeated play of the game or the inquiry approach.

4. Year in school is a significant factor in performance on the Pretest and Posttest I, but not for Posttest II performance.

5. There is evidence that the tests possessed face validity and that they were reliable.

6. Despite the fact that the game methods did not prove superior to the inquiry method, they did not exhibit detrimental effects on learning.

7. The students indicated that they found the game experience an enjoyable one.

RECOMMENDATIONS

One of the underlying purposes of this undertaking was to stimulate the investigation of the development and use of games as teaching tools in Health Education. The following recommendations are offered based on the experience of this research effort.

1. Further research with the game Propaganda would be facilitated by stronger evidence of the validity and reliability of the tests used to assess learning gains. Elaboration of the tests used in this study and a thorough item analysis accompanied by more extensive validating procedures and assessment of reliability would provide useful instruments for further research and/or for general classroom use.
2. There are a number of ways in which the game Propaganda can be incorporated into the classroom, e.g., small segments of play over several class periods or extended play over a shorter period of time. The way in which the game is used may influence how much learning occurs and how well it is received by the participants. Research of this nature could shed light on the most effective ways of using the game.

3. The relationship between the active involvement of game participants in game modification and the retention of knowledge merits further investigation. Of particular significance would be longitudinal studies involving these factors.

4. This study compared a non-simulation game with a teaching method which possessed many of the same characteristics as the game. A question remains regarding the outcomes if a more traditional teaching methodology were to be employed, and such research might provide more insights into the value of non-simulation games.

5. The game Propaganda may be more useful with students at a particular maturation level. Since year in college was found to be significant in this research, a study which concerns itself with this issue could prove valuable.

6. The attitudes of college students toward the use of non-simulation games such as Propaganda might be studied
to determine if this method could be effectively used at the college level.

In addition to the foregoing recommendations which are derived from the findings of this study, the following suggestions for further research are verified from the review of the literature.

1. There is a need for the development of a methodology for defining and evaluating the outcomes of simulation games in particular.

2. It has been speculated that higher levels of cognitive learning result from participation in games. Research on this issue would provide extremely useful information for practitioners.

3. Games cannot be used as an exclusive methodology. How can they most effectively be integrated with other classroom activities?

The potential for the effective application of simulation and non-simulation games in Health Education appears promising. Since the research with the use of educational games in this discipline is only beginning, there are numerous questions to be answered. The following are some suggestions for research with games in Health Education.

1. There is a distinct need for the development of simulation and non-simulation games specifically designed for topics in the discipline of Health Education.

2. Some topic areas in Health Education may lend themselves to the use of simulation or non-simulation games.
more readily than others. There is a need to determine what subjects are most "gameable", and if games are best methodology to use in these cases.

3. The use of simulation games in Health Education could prove to be one of the greatest teaching devices at our disposal. The realities of poor health are difficult to communicate to those who are well. There is a need to determine if simulation games can be more effective in teaching preventive behaviors pertinent to certain diseases than are conventional methodologies. Simulation games could prove particularly useful in this regard for teaching the long-term effects of behaviors associated with the cause and the prevention of diseases which develop over a period of years.
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INSTRUCTIONS FOR THE PLAY OF THE GAME PROPAGANDA

NOTE: ANY STUDENT WHO HAVE NOT TAKEN THE PRETEST AND THE ATTITUDE SURVEY SHOULD COMPLETE THEM BEFORE PLAYING THE GAME.

Enclosed in the envelope are packets of materials. Attached to each packet is a card with the names for the teams for today's play. The first name on each list is the name of the team captain for the day.

Give the packets to the captains and instruct them to collect the remaining members of the team. (If the captain is absent, then the next person on the list becomes the captain.)

Each team should have no more than 4 members, but no less than 2. If there are two teams with only two members, combine them into one team.

THE GAME PACKETS ARE NOT TO BE OPENED UNTIL YOU INSTRUCT THE STUDENTS TO DO SO.

When the teams are organized, instruct the captains to open the packets and to distribute the player tokens, the prediction wheels, and the techniques cards. The captain should also lay out the Clear Thinking Chart where all players can see it and reach it.

Each game packet contains the following:

- 4 player tokens
- 4 prediction wheels
- 4 techniques cards
- 1 Clear Thinking Chart
- 1 set of persuasion technique examples
- 1 sealed envelope containing the answer cards
- 1 scoring summary card

When all of the materials are properly distributed, read the rules of the game to the students.

GAME RULES

1. Place the persuasion technique example cards face down on the desk.

2. Each player should place his or her token at 0 on the Clear Thinking Chart.
3. The player to the left of the captain draws an example card and reads the example to the other players.

4. Referring to the technique cards, the players independently choose the persuasion technique which is considered the best description of the example that was read. When the decision is made, then each player indicates his choice on his own prediction wheel. IF THERE IS NO APPARENT MATCH, PLACE THE DIAL AT 0.

5. When all players have made a choice, the prediction wheels are exposed.

6. If all answers match, each player moves his or her token up one space on the game sheet.

7. If all answers do not match, the technique receiving the greatest number of votes is the "correct" answer. Players with this answer move ahead one space on the Clear Thinking Chart and the others remain at their previous position.

8. If there is a tie, refer to the answer cards in the sealed envelope. This answer is counted as one vote. If the answer card disagrees with the answers involved in the tie, disregard the play and all players stay at their previous position.

9. EXCEPTION: If a player feels that his or her answer correctly predicts the answer card's answer, even though his answer is a minority vote, he may make a BOLD CHALLENGE. The answer card is then consulted. If he is "correct", he moves up as many spaces as there were popular votes. Then the popular voters all move back one space. If the challenger is wrong, he moves back as many spaces as there were popular voters and the popular voters each move ahead one space.

10. Play proceeds with the examples being read in a clockwise manner.

11. Continue play until all cards are used.

12. The winner is the player with the most points. In case of a tie, more than one person is declared a winner.

13. WHEN PLAY IS TERMINATED, EACH PLAYER SHOULD WRITE HIS OR HER NAME ON THE SPACE HIS TOKEN OCCUPIES AT THE END OF THE GAME.

14. The captain should collect ALL of the game materials and put them back in the plastic bag and turn them in to the instructor.
APPENDIX B

TEST INSTRUMENTS
NAME ____________________________________________
AGE ________
SEX (Circle One) Female    Male
MAJOR ____________________________________________

***************

TECHNIQUES OF IRRELEVANCE
PRETEST

INSTRUCTIONS: Listed below in the left hand column are some techniques employed in advertising and persuasion. On the right are some examples of these techniques. Place the letter of the persuasion technique in the blank by the example(s) which reflect that technique. If there is no technique listed for an example, place a zero (0) in the blank. A technique may be used more than once.

<table>
<thead>
<tr>
<th>TECHNIQUES</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Appearance</td>
<td>(f) 1. Out with the spenders. Spending increases and spending rate increases.</td>
</tr>
<tr>
<td>b. Manner</td>
<td></td>
</tr>
<tr>
<td>c. Degrees and Titles</td>
<td>(e) 2. Farley Forbes, Gloria Hale, Charles Fartig, Tuesday Wells, and a number of other well-known Americans have taken the blindfold cigarette test. They have smoked four leading brands of cigarettes, clearing the tests with black coffee between smokes. Only one question was asked, &quot;Which do you like best?&quot; All chose MINSTON.</td>
</tr>
<tr>
<td>d. Numbers</td>
<td></td>
</tr>
<tr>
<td>e. Status</td>
<td></td>
</tr>
<tr>
<td>f. Repetition</td>
<td></td>
</tr>
<tr>
<td>g. Slogans</td>
<td></td>
</tr>
<tr>
<td>h. Technical Jargon</td>
<td></td>
</tr>
<tr>
<td>i. Sophistical Formula</td>
<td>(d) 3. I talked to fifty people--imagine, fifty. Not one of them likes Lujana. And you stand there and tell me you like their food.</td>
</tr>
<tr>
<td>TECHNIQUES</td>
<td>EXAMPLES</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>a. Appearance</td>
<td>(h) 4. Sir, your valvoid auricles are dangerously degenerated causing funiculosis of the aplema. I would advise an operation without delay. Just what is the funiculosis, doctor? I've never heard of it before.</td>
</tr>
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<tr>
<td>f. Repetition</td>
<td>(g) 5. Humble service stations: Put a Tiger in your Tank.</td>
</tr>
<tr>
<td>g. Slogans</td>
<td>(a) 6. What do you want him for?</td>
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<td>h. Technical jargon</td>
<td>(a) 8. Look at those big guys! We can't win this game.</td>
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<td>i. Sophistical Formula</td>
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**EXAMPLES**

Sir, your valvoid auricles are dangerously degenerated causing funiculosis of the aplema. I would advise an operation without delay. Just what is the funiculosis, doctor? I've never heard of it before. Its quite rare. As I said it results from degeneration of the valvoid auricles.

Humble service stations: Put a Tiger in your Tank.

What do you want him for? Look, girl, his face is dirty; his nose isn't straight; his teeth stick out; he's got pimples. I thought you had better judgment.

Let's give FDR a fourth term in office. The war's not won yet. Don't change horses in the middle of the stream.

Look at those big guys! We can't win this game.

You've failed all your courses quarter after quarter. But cheer up! It's a long road that has no turning, you know.

He was such a well-behaved man, so understanding, so sincerely helpful. He wanted to help us. I couldn't insult him. So I gave him our savings to invest. He seemed so trustworthy.

The name on the office door reads "James A. Rydack, Th.B., M.Th.R., As.D." A woman about to enter the office says to her husband, "With all those letters behind his name he must know his stuff."
**TECHNIQUES OF IRRELEVANCE**

**POSTTEST I**

**INSTRUCTIONS:** Listed below in the left hand column are some techniques employed in advertising and persuasion. On the right are some examples of these techniques. Place the letter of the persuasion technique in the blank by the example(s) which reflect that technique. If there is no technique listed for an example, place a zero (0) in the blank. A technique may be used more than once.

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<td>(f) 2. Spenders are in all the offices at Washington. Spend and spend.</td>
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<td>c. <strong>Degrees and Titles</strong></td>
<td>(e) 2. Farley Forbes, Gloria Hale, Charles Fartig, Tuesday Wells, and a number of other well-known Americans have taken the blindfold cigarette test. They have smoked four leading brands of cigarettes, clearing the tests with black coffee between smokes. Only one question was asked, &quot;Which you you like best?&quot; All chose MINSTON.</td>
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<tr>
<td>g. Slogans</td>
<td><em>(c)</em> 11. The name on the office door reads &quot;James A. Rydack, Th.B., M.Th.R., As.D.&quot; A woman about to enter the office says to her husband, &quot;With all those letters behind his name, he must know his stuff.&quot;</td>
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TECHNIQUES OF IRRELEVANCE

POSTTEST II

INSTRUCTIONS

Earlier in the term, you had an opportunity to study some techniques used in persuasion. Today's exercise is to determine what you can recall from that experience.

For each of the following, in the blank preceding the advertisement, write the name of the persuasion technique which you think is best reflected in the example.

1. **(Technical jargon)**

   "To protect your skin against dryness and irritation, nature gives it balanced pH, plus a delicate layer of moisture and emollients. The trouble is, soaps can wash this precious protection away along with the dirt."

   "Phisotherm is a pure white liquid skin cleanser with the same pH as normal skin. It has a highly effective cleansing ingredient that cleans deep--and emollients like skin's own to replace the softness soaps can wash away."

2. **(Degrees and Titles or Status)**

   "What do doctors prescribe most for pain-stiff joints when arthritis acts up?"

   "The pain medication doctors prescribe most for arthritis also has a most effective anti-inflammatory action."

   "What you should know is that this ame medication i in today's Anacik tablets."

3. **(Sophistical formula)**

   "For energy and stamina, one important thing you must do is eat right. Good-tasting Bletschmer Wheat Germ adds a healthy helping of natural protein and vitamins to your breakfast or any meal."

   "You are what you eat."

4. **(Repetition)**

   "Sir, how would you describe Listerine Antiseptic Mouthwash?"

   "Two."

   "Too strong?"

   "No, two times longer. You see, Sisterine's germ killing action lasts two times longer than the leading sweet-tasting mouthwash. Listerine is not too strong. It has to be strong to kill germs that cause bad breath."

   "Listerine lasts two times longer."
"Thanks to Yoga, I've taught my body to think young and I've recovered powers I thought were lost forever. If a paunchy, middle-aged writer like me can do it, anyone can. Including you."

Jeff Stearn

"Those horrid age spots. Help fade them with Tsoterica. Makes your skin look years younger."

"Not a cover-up. Tsoterica actually goes into the skin where it works in the pigment-forming cells to help make your skin look lighter and younger again."

"Discover the beauty of Empiric Compound. With Empiric Compound you get relief from beautiful teamwork. Three ingredients bring relief when you need it."

"Its maker—Furroughs Welcome Company—has a fine reputation. A unique company whose profits are channeled into medical research to bring better health to all. That's beautiful, too."

"Victory over cancer without radium or surgery. This book gives new hope to all sufferers."

"Cyril Bott, a competent lay researcher, a professional medical writer, author of Doctors, Disease and Health, Health Diet and Common Sense, Medicine, Rational and Irrational—one of England's top authors—compiles a survey of cancer causes and cancer treatments."

"Cyril Bott in his book Victory Over Cancer explores known and unknown methods. He offers the medical doctor and all others in the healing arts information that cannot be found in medical journals."

"Fish and Germs Oil combines all of the great known oil-soluble factors of nature. A balanced blend of Fish Liver Oil, Wheat and Soya Germ Oils, natural tocopherols in complex with liquid lecithin. It is quickly emulsified and easy to digest. It is richer than wheat germ oil in tocopherol potency alone yet costs far less. Each tablespoonful provides vitamins A and D 140% AMDR; vitamin E 30 Int Units; vitamin K. Linoleic, Linolenic, and Arachadonic Acids."

"Summertime and the living is greasy... spicy."

Soothe that upset stomach with Bepto-Pismol.

"Its a protective coating between the upset and the stomach."
11. (Manner) ________________ "I've never been happier.
The kids are doing well. We have a beautiful grand-
child. Charlie and I get to spend more time together
than ever. And he still treats me in that very special
way. It really pays to take care of yourself."
    "Those are wonderful words to hear a woman say.
And she's right—it does pay to take care of yourself."
    "You should eat the right foods, get your rest and
exercise. And to make sure you get enough iron and
vitamins, take Baritol every morning."

12. (Degrees and titles) ________________ "Never mind how good it
tastes. What counts for me is the vitamin C in Tang."
    "It's not easy to impress Sylvia Maid. She's an
aquanaut who spends hours beneath the surface of the
ocean. She's a Ph.D. in marine biology."

13. (Slogans or Repetition) ________________ "The extra-strength formula.
Relieves headache pain and so its tension fast!"
    "Take fast acting Anacik—the extra-strength pain
relief formula."

14. (Technical jargon) ________________ "Gi-Bel. Made especially
for 'Gasid Indigestion'."
    "Distress of occasional heartburn or acid indiges-
tion often accompanies painful trapped gas. That's
what we call Gasid Indigestion. No plain anti-acid
relieve Gasid Indigestion. But Gi-Bel with patented
Simethicant can."

15. (Numbers or Degrees and Titles) ________________ "When 3,500 cardiologists
met, they ate just what the doctor ordered.
AMERICAN COLLEGE OF CARDIOLOGY LUNCHEON
    Chilled Grape Juice
    Broiled Breast of Capon
    Brown Rice
    Cling Peach
    Fruit Goblet
    Coffee
    Frye Crisp and Bleishman's Margarine

16. (Technical Jargon or Repetition) "EARITIS making your ears
hurt and itch? 'Earitis'—annoying pain and itch in
your ears—can be brought on by excess wax. But when
you try to remove the wax with pointed objects, you may
injure your ears! There's a better, safer way to remove
wax—with EARO Ear Drops. When excess wax is gone, pain
and itch of 'Earitis' is gone."
    "Get EARO to help stop 'Earitis'."
17. (Status) ______________________ "If Folgate is just a kid's cavity fighter, how come Len Dawson won't brush with anything else?"

   "In the rough world of pro football, every top quarterback has one thing in common: leadership. Men who lead people generally like people. And Len Dawson is no exception. That's one reason he's a Folgate man."

18. (Sophistical formula) ______________ "If you ask the average doctor whether you should take vitamin E, he will no doubt discourage you, but if you press him hard enough, he will say it can't do you any harm."

   "Well, from a person who used to get headaches on a regularly scheduled basis since early childhood, may I say that from 1942 to the present... I haven't had one headache. Does this mean something? You tell me."

19. (Appearance) ______________________ "Can I really look younger at my age"

   "The happy answer is yes."

   "Join those younger-looking women who have experienced the beneficial results of faithful use of this unusual formulation. It is known as Oil of Bla beauty lotion. Beauty researchers have developed the blend to soothe away dryness, the very dryness that accents the little lines and wrinkles that make you look older."

20. (Appearance or Repetition) ________ "I gave up smoking and lost 68 pounds."

   "The day I took my last puff, it seemed like I blew away my willpower. Because once the smoke cleared, the scale began to go up until I reached 196 pounds."

   "Deep down, my weight problem was gnawing at me. That's why I tried so many pills and diets. But they made me nervous so I had to give them up."

   "Thank goodness, I'd read the stories of people who'd lost weight with the help of the Fayds plan."

   "For breakfast, I'd have two Fayds with hot coffee about 20 minutes before a hard boiled egg. At lunch, two more Fayds with coffee, a salad, lean meat and a vegetable. Then Fayds afternoon snack of Fayds and tea. And at supper, Fayds and coffee before meat or fish, a vegetable and salad."

   "Now, thanks to the Fayds plan, I'm down to 128 pounds."
APPENDIX C

INSTRUCTIONS FOR FACULTY MEMBERS
DIRECTIONS FOR ADMINISTERING THE PRETEST AND ATTITUDE SURVEY

Enclosed in this packet of materials you will find Pretests for each of your students. In addition, those who are working with the experimental groups will find a set of Attitude-Surveys. Please follow the directions in administering the survey and/or test.

You are to integrate this project into your course work on Consumer Health as much as possible. It is suggested that no special issue be made with your students that this is part of an experiment. Explain to your students that we are trying some different approaches to instruction in the course, and we will be evaluating them in an effort to determine their effectiveness.

DIRECTIONS:

A. Pretest-
   1. Distribute the pretests to the class.
   2. Instruct the students to provide the information requested at the top of the page.
   3. Have the students read the directions and complete the test.
   4. INSTRUCT THE STUDENTS TO FILL IN ALL THE BLANKS.
   5. When all are finished, collect the papers. (This test should require no more than 10 minutes.)

B. Attitude Survey-
   1. After you have recovered all of the pretests, please distribute the Attitude Survey.
   2. Instruct the students to put their names in the blank at the top of the page, to read THE INSTRUCTIONS, and to complete the survey.
   3. They are to leave no items blank.
   4. Collect the surveys.

THANK YOU FOR YOUR ASSISTANCE IN THIS PROJECT.
INSTRUCTIONS FOR THE ADAPTATION OF
THE GAME PROPAGANDA

Your students will have had an opportunity to have studied the "techniques of irrelevance" and to have played the original game once. Now they are to adapt the game so that the examples of the 9 "techniques of irrelevance" are all advertisements for health products or services.

PROCEDURES:

1. As with the initial play, there are packets of materials for each team. Each packet includes the following:

   1 list of team members
   1 list of the five techniques for which each team is responsible
   1 Clear Thinking Chart
   1 Technique Card
   1 Technique Sheet
   4 tokens
   4 Prediction Cards
   5 numbered blank cards

2. Each team has 1/2 hour in which to prepare the five ads (one ad for each technique assigned them). Team members may select a technique and work independently or the team may choose to work as a group on each technique. Ads should be kept brief.

3. When an ad has been completed, it is to be written on one of the numbered blank cards (it does not matter which one), and the answer is to be placed on the back of the card.

4. Each ad example should be studied by all team members so that its accuracy and answer may be verified.

5. At the end of the half hour, teams should exchange ad examples and play the game in the same manner as before. The schedule for the exchange is as follows:

   Team A's examples go to team B
   B to A
   C to B
   D to C
   E to D
6. If any ad or answer is not clear, it should be challenged and the team that authored it should make the necessary revisions.

7. Students are encouraged to be creative. Their ads should not use the names of real products or persons.

8. At the end of the class, all ad examples should be returned to the team that created them. All materials should be placed in the packets and returned to the instructor.

9. During the next class period, your class will play the game with the examples created by the other class participating in this phase of the project.

NOTE: Should you find it impossible to accomplish the above in one class meeting, have your students spend the hour working on the creation and verification of the ads in their own teams, and eliminate the game play for this period.

************

Here are two examples which may help your class get started:

1. "Brush your teeth with Diamond Dust. Diamonds are a girl's best friend."
(Slogan)

2. "E-Complex 400 contains all 4 natural tocopherols (alpha, beta, gamma, delta). You'll like this truly natural ultra-high potency E."
(Technical Jargon)
INSTRUCTIONS FOR THE ADMINISTRATION OF POSTTEST II

Posttest II consists of twenty examples of advertisements for health products. Each of the nine "techniques of irrelevance" is represented at least once. This is the first time that your students will be asked to identify the techniques without having a list to which to refer. PLEASE DO NOT ASSIST THEM IN RECALLING THE NAMES OF THE TECHNIQUES. Give them no information or instructions except the following which also appear on their test papers.

1. Place your name on the space provided.

2. Earlier in the term, you had an opportunity to study some techniques used in persuasion. Today's exercise is to determine what you can recall from that experience.

3. In the blank preceding each advertisement, write the name of the "techniques of irrelevance" which you think is best reflected in the example.

4. If you are not sure of an answer, put down what you think it is anyway.
APPENDIX D

STUDENT PREPARED EXAMPLES OF

"TECHNIQUES OF IRRELEVANCE"
The Experimental I groups were given the task of adapting the game Propaganda so that the examples reflected advertisements for health products or services. These groups were divided into teams and each team was assigned five different "techniques or irrelevance" for which ads were to be prepared. The following are the results of that endeavor.

Class 1

1. A small group of well-to-do beautiful women from Washington, D.C. took part in an anti-stain deodorant commercial in which they jogged through the beautiful forest and then held up their arms to prove there was no stain. (Appearance)

2. The old man was suffering from a toothache and needed relief fast. He came across a dentist's office bearing the name Dr. Howard S. Smith, DDS, TS, and Ph.D. in the practice of modern dentistry, and immediately entered the office figuring he would be cured. (Degrees and Titles)

3. Carriers cure all. Get Carriers, they have the better ideas. (Slogan)

4. Although the senator was a highly intelligent man, having passed a state test in medicine, I saw him roaring drunk at the fund-raising dinner. Now he couldn't buy my vote. (Manner)

Get Everalls to do the job right. (Repetition).

6. Try our Rubber Dubber tire. 
It's the roll of the champions. If it's Rubber Dubber, depend on it. (Slogan)

7. Use Mr. Wonderful Hair Tonic. Over a million have been sold already. Hurry out and get Mr. Wonderful before it's too late. (Numbers)

8. She acts like such a refined woman. She must have the Now Women kit by Drabiline. (Manner)

9. Sure-Fire Aspirin contains benzodrine triacitate, 500 grams of anti-biotic antihistamines, . . . . with these ingredients, we'll cure anything. (Technical Jargon)

10. Dr. Adakis Finch, with a Ph.D. in physics, uses Inkglide pens. (Degrees and Titles)

11. Dr. I. Lowell, Ph.D, BBA and MBA, will be speaking tonight on behalf of the Honorable Walter Williams, associate to the law firm J. L. Brothers, Inc. for the position of Chairman of the Board of Health. We think we have a winner here! (Degrees and Titles)

12. Four out of five housewives surveyed recommended the use of Bright for brighter dishes and softer hands. (Numbers)

13. Kolga Orbit, top olympian gymnast, applies Dr. Fringles Foot Powder for those hot, long workouts. Why shouldn't you? (Status)

14. With the use of Wailey's New Zit-Free Cream, containing the active ingredients chloral benziline, rescorcinal,
sulfur and alcohol, those ugly blemishes and acne will soon disappear. (Technical Jargon)

15. Our neighbors, the Jones, would fight every night. You could hear them shouting profound words, slamming doors, and occasionally breaking windows.

We bought them a bottle of Dr. Knows sedative to relieve those uneasy feelings. It can work for you, too. Try it! (Sophistical Formula)

16. I just can't believe it, yesterday she had hair that looked like it was never washed before, but a couple of days later, she looked like someone who had just received a new head of hair. She must be using that shampoo called Silky. (Appearance)

17. The door-to-door salesman was so nice and understanding. I just couldn't hurt his feelings so I bought his whole suitcase full of products. It made him so happy. (Manner)

18. Turn on to Turkey Tuna. Turkey Tuna for lunch, Turkey Tuna for brunch, Turkey Tuna for that extra crunch. If you like food, you'll like Turkey Tuna. (Repetition)

19. Follie Beds are used by everyone. Don't be left out in the cold, join those who know true comfort.

These beds are owned by the stars, Joe Namath, Raquel Welch, and many more.

So if you want to feel like a star and sleep well. . . . Buy Follie Beds. (Status)
20. Have no fear. Motorwheel is here. We build them rougher and tougher. (Slogan)

These examples were shared with the other Experimental I group, and only two were challenged. Number twelve was questioned on the basis of its characteristics of the "appearance" technique. Number fifteen was criticized as being too general and for not having the characteristics of the "sophistical formula."

Class 2.

1. Hey, where did her wrinkles go? Just last week she looked like a prune. By using amazing Dippy Wip Facial Creme she seems years younger. (Appearance)

2. He was new in the neighborhood and he didn't know anyone. He was nervous when he met the girl next door and he fumbled over his words. But after only a week of chewing new "Calms You a Bit" bubblegum, he sure acts more sure of himself. I'll bet he gets a date. (Manner)

3. Don't have sand kicked in your face by the beach bully. Use the Frank Hercules Muscle Toning exercise machine. Over one million American men used it and then raved about its results. (Numbers)

4. Do you have the runs from the dorm food, take Easy Dose. Easy Dose is the easy and comfortable way to get rid of the runs and it does. Remember Easy Dose when things get runny. It is so easy. You can buy Easy Dose at your nearest drugstore. (Repetition)
5. By popping one minute Zeenera down your esophagus, you will be relieved of phyochemical reactions such as lassitude, euphoria and sedation, extracting you from the severity of illegally purchased medicines bought by the common homosapien. (Technical Jargon)

6. A modern young couple are walking in Time Square. The light of love is in their eyes. The voice over says, "They use Musk Oil--don't you think you should?" (Appearance)

7. In 1969 one million people switched from their previous motor oil to Sludge. Two years later that number rose to five million. By 1974 it was eight million. When are you coming over? (Numbers)

8. You should use Lucios Lips because Lucios Lips makes your lucious lips look luciously lippy; and when your husband sees you in Lucios Lips, he will say your lucious lips look luciously lippy. (Repetition)

9. Due to a fantastic discovery of Z-ELEVEN ELEVEN Shine-On shampoo company brings you a new shampoo, "Shine-On". Z-ELEVEN ELEVEN stimulates the inner scalp cognizance and builds stronger sterile tissues to ensure beautiful and healthy hair. Use it everyday. (Technical Jargon)

10. "She moves so flawlessly with that arthritis remover. Look at the way she smiles at all the men who enjoy her company so much. She's just great." (Manner)

11. Sliner Liner will make you look finer. (Slogan)
12. Steve: Hey Bob, we've been studying for two hours. I've got the munchies.

Bob: I could really dig a pizza.

Steve: Yeah, that would be heavy!

Another day of college, another step towards knowledge.

(Sophistical Formula)

13. Consumer advocate Ralph Nader agrees with the highly regarded study in Consumer Reports written by Dr. Goodwell, eye specialist, that Lizine eye drops are more effective than any other leading eye drop manufacturer.

(Status)

14. How could two million people be wrong when 85 out of 100 finalists in the World Beauty Pageant enjoy drinking "Inch-Off", the newly developed weight-reducing milkshake? (Numbers)

15. Raid air freshener containing $P_4Ch$, $EX_0$, $C_2O$ and $N_3H$ was a new scientific discovery used for the Apollo II flight. It also contains aluminum-phosphorus which helps fight bacteria. (Technical Jargon)

16. If you want to keep your nails long, longer, longest--Longsaid is for you. It makes your nails long at last and last long. (Repetition)

17. Clint Eastwood, Robert Redford, and Paul Newman all agree that Grit cologne keeps the girls chasing them.

(Status)
18. During a recent medical convention at U of M Medical School we spoke to two leading authorities on the effects of aspirin. Professor James Jones, M.D., Ph.D., B.A., D.D.S., said that Rayer aspirin was the kind most of the doctors recommended. Dr. Thomas Grey, chairman of the A.M.A., supported his opinion. (Degrees and Titles)

19. She has the softest, shiniest, most beautiful and manageable hair in town. The only way her hair could look that good is because she uses Brell shampoo. (Appearance)

20. He's such a nice man—so confident, so sure of himself. He must use Dentu-Stick. (Manner)

21. Last year 900,048 Americans switched from M.D. 30-30 to the new taste sensation Rock Gut 60-60. (Numbers)

22. People who like to live drink Life. Life gives you life. If you want to live, drink Life! (Repetition)

Number fourteen was the only example from Class 2 about which a question was raised. In two separate cases, it was suggested that there were insufficient degrees and titles used. One team decided that since the ad contained only the doctor's name that it should be "status" rather than "degrees and titles."
SURVEY OF ATTITUDES TOWARD GAMES*

INSTRUCTIONS: Below are some statements about games. In this case, the word "games" applies to board games (Monopoly, Scrabble, Chess), card games (Rummy, Poker), etc., and not to athletic games. For each item, please circle the word or phrase which best represents your attitude.

1. I like to play games.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

2. What I like about games is the chance taking.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

3. What I like about games is the competition.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

4. What I like about games is making friends.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

5. One can learn a lot by playing games.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

6. I like any kind of game at all.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

7. I think I would like to develop a game.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

8. I would rather play a game than read a book.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

9. Games are man's (woman's) best friends.
   **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

10. Games take your mind off your troubles.
    **Strongly Agree**    **Agree**    **Neutral**    **Disagree**    **Strongly Disagree**

ATTITUDE SURVEY II (EXPERIMENTAL I) FORM A

INSTRUCTIONS: Now that you have had an opportunity to participate in an educational game, please identify your feelings with regard to the following statements by circling the word or phrase which best represents your attitude.

1. I like to play educational games.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

2. I would like to see more educational games used in the classroom.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

3. Educational games make learning fun.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

4. Educational games make learning easier.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

5. Educational games break the monotony of usual classroom routine.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

6. I would have liked to have had more time to play Propaganda (the game used in class).
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

7. I looked forward to coming to class to play the game.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

8. The game was not too competitive.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

9. I think that I would like to try to design an educational game.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
10. I think that I learned more about persuasion techniques from playing the game than I would have from lectures.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

11. I think I learned more from the game than I would have from a reading assignment.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

12. I learned more from adapting the game than from playing it.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

COMMENTS:

A. Some of the things that I enjoyed about playing the game were:

B. Some of the undesirable aspects of playing the game were:

C. Other comments:
ATTITUDE SURVEY II (EXPERIMENTAL II) FORM B

INSTRUCTIONS: Now that you have had an opportunity to participate in an educational game, please identify your feelings with regard to the following statements by circling the word or phrase which best represents your attitude.

1. I like to play educational games.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

2. I would like to see more educational games used in the classroom.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

3. Educational games make learning fun.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

4. Educational games make learning easier.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

5. Educational games break the monotony of usual classroom routine.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

6. I would have liked to have had more time to play Propaganda (the game used in class).
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

7. I looked forward to coming to class to play the game.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

8. The game was not too competitive.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

9. I think that I would like to try to design an educational game.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
10. I think that I learned more about persuasion techniques from playing the game than I would have from lectures.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

11. I think I learned more from the game than I would have from a reading assignment.

Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

COMMENTS:

A. Some of the things that I enjoyed about playing the game were:

B. Some of the undesirable aspects of playing the game were:

C. Other comments:
APPENDIX F

CORRESPONDENCE
November 22, 1974

Dr. Gary D. Fenstermacher
College of Education
University of California at Los Angeles
Los Angeles, California 90024

Dear Dr. Fenstermacher,

I am presently conducting a research project in educational gaming for my doctoral dissertation. In this regard, I would like to employ the attitude survey developed by Patricia Jersin for her dissertation. In order to do so, I would like to obtain her permission. I am writing to you, as her advisor, in an attempt to obtain her present address.

Your assistance in this matter is appreciated.

Sincerely yours,

Myrna A. Yeakle
Chairman, Health and Safety Division
November 30, 1974

Myrna A. Yeakle, Chairman
Health and Safety Division
Eastern Michigan University
Ypsilanti, Michigan 48197

Dear Ms. Yeakle:

I received your letter from my dissertation chairman, Dr. Gary D. Fenstermacher, Department of Education, UCLA, in regard to your request for use of my attitude survey in gaming.

Feel free to use it as you see fit, and best wishes in pursuit of your doctorate. You may be interested in knowing that yours is the first request to use that survey. I must have had 100 requests to use the "philosophical test" I constructed.

Regards,

Patricia D. Jersin, Ed.D.
Department of Secondary Education
School of Education
July 31, 1974

Mrs. Blanche Moulds
340 Miller Avenue
Kent, OH 44240

Dear Mrs. Moulds:

I am presently preparing to conduct a research project involving the game Propoganda. In connection with this, I have obtained from Layman Allen a copy of some of the tests developed by your husband for use with the game, and for the Philosophy 281 course. I would like to obtain your permission to use selected items from those tests. You can be assured that appropriate credit will be given.

Thank you for your consideration on this matter.

Sincerely yours,

Myrna A. Yeakle
Chairman, Health & Safety Division
Mrs. Janice Moulds
340 Miller Ave.
Kent, Ohio

August 17, 1970

Dear Mr. Yorkie,

In answer to your letter pertaining to the essay tests prepared for the Game Propaganda and for Philosophy 281 course,

I have no objection. I would appreciate a copy of your project when completed. Sincerely,

Mrs. Blanche Munday
September 15, 1975

Mr. Robert Allen
National Academic Games
P.O. Box 214
Newhall, California 91322

Dear Mr. Allen,

I am presently completing a doctoral dissertation involving the Propaganda Game and am seeking your permission to include in the appendix the section in the game manual which explains the "techniques of irrelevance" (pp. 20-22).

The research has involved an investigation of the effectiveness of Propaganda in teaching the "techniques of irrelevance" to students in an introductory college health course. It was initially precipitated by a workshop in gaming at the University of Michigan. I met Layman as a result of this workshop and he has provided some pertinent materials and guidance.

Thank you for your cooperation in this matter.

Sincerely yours,

Myrna A. Yeakle
Chairman, Health and Safety Division

Department of Health, Physical Education & Recreation
(313) 487-0091
September 27, 1975

Myrna A. Yeakle
Chairman
Health and Safety Division
Eastern Michigan University
Ypsilanti, Michigan 48197

Dear Ms. Yeakle:

You have my permission to use any sections of the game manual you wish.

Please send me a copy of the work you are doing.
I am very interested.

Good luck!

Yours in education,

Robert W. Allen

RWA:sp