

A COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF ANIMATION  
VERSUS DRAMATIC REPRESENTATION IN TEACHING  
GREEK MYTHOLOGY THROUGH FTV

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by

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## ABSTRACT

# A COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF ANIMATION VERSUS DRAMATIC REPRESENTATION IN TEACHING GREEK MYTHOLOGY THROUGH ETV

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The primary focus of the present study was to compare the differential effect of two presentational methods in educational television, namely animation and dramatic representation, on the learning of Greek mythology. The sample population consisted of 90 students enrolled in grade six classes. Ss were randomly assigned to two treatment groups and one control group. Two different versions of the same TV program consisting of "animation" and "dramatic representation" segments were shown to the treatment groups. All subjects were administered a 29-item multiple choice comprehension examination covering the content of the program ( $KR_{21} = .83$ ). A 14-item questionnaire measuring attitudes towards the program was also administered to the two experimental groups (split-half  $r = .68$ ). Two way analyses of variance revealed significant overall differences ( $p < 0.01$ ) between groups. Tukey multiple comparison tests revealed that both experimental treatments were superior to the no-treatment control group ( $p < 0.01$ ). Although no significant difference in learning was found between the two experimental treatment groups, the higher mean score achieved by subjects exposed to the animation treatment, did however, suggest that it was more effective than the dramatic representation. A significant difference was also found between the two experimental treatment groups on the attitude towards the program measure in favor of the animation version.

On the basis of this study no firm recommendations may be advanced with respect to the differential effectiveness of the two treatments in facilitating cognitive acquisition. However, the animation treatment appears to be preferable to dramatic representation as a stimulating presentational strategy for ETv. Copies of the TV program are available at Concordia University library.

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## CHAPTER 1

### INTRODUCTION

#### CONTEXT OF THE STUDY

Despite years of effort by educators and researchers, little is known about how children learn. We know even less about the educational possibilities of television (Lesser, 1974). Although studies comparing different kinds of media have shown that television, in terms of effectiveness, is as good as other media and conventional teaching in imparting information (Chu and Schramm, 1967), relatively limited attention has been given to the differential examination of television production techniques and their effect on learning (Coldevin, 1975).

During the period 1950-1967, Hideyee (1956), Stickell (1964), Reid and McLennan (1967), Chu and Schramm (1967), conducted the most comprehensive reviews of research comparing one class of media versus another. The basic conclusion reached was that no significant differences were found between the use of television as an instructional tool and any other medium. This conclusion, based on a large amount of evidence, implies that television does have instructional potential. It also indicates that TV is as effective as any other medium for instruction.

The fact that educational television has been utilized at an



increasing rate both in schools and homes, makes obvious that the use of TV technology can benefit our educational system. However, ETV producers have until now had very few guidelines which they could use in designing educational programs. As Lesser (1974) notes, the various approaches used by educational program planners are based more on their insight and observation rather than on evidence contributed by research.

Since the aim of most educational television is learning, future research must attempt to identify how ETV can contribute to more efficient learning. It is important to know how the medium can be used most effectively to enable students to achieve the objectives in the cognitive and/or affective domains, which are the primary intended outcomes of the educational process. Rather than attempting to evaluate a televised program as compared to another form of media, research should be directed towards a systematic exploration of presentational variables related directly to the medium itself. Schwarzwald (1960), was one of the first instructional television researchers to examine presentation techniques unique to the television medium. He noted that many studies do not involve television as a unique medium, with potential for developing particularly effective visual presentation devices.

Educational producers should have data outlining the relative effectiveness of various television production variables. In order for educational technology to have answers to the problems encountered by the ETV producer, a systematic exploration of the effects that TV production variables have on learning is required. Ives (1971), proposes an approach which begins with specific programs, identifies the various effects that the programs may produce, defines more vigorously the variables that may produce the effects, and conducts experimental investiga-

tion of the variables and their effects. As Schramm (1972) notes, the number of studies related to educational television have demonstrated only a few findings of broad generality. So much of the effectiveness of ETV depends on intrinsic conditions and particulars. Therefore, although basic research leading towards general theory is important, specific research designed to test methods of presentation of specified materials is of more immediate usefulness to the educational producer. In this spirit, it was the intent of the present study to determine the effects of two presentational methods, namely animation and dramatic representation, on the learning of Greek mythology by young children.

#### PROBLEM STATEMENT AND CLARIFICATION

The purpose of this study was to evaluate differences in learning among elementary school subjects who viewed an educational program in Greek Mythology presented in two different ways. By holding part of the production technique constant, the primary focus of the present study was to compare the differential effect, if any, of the animated versus the dramatically represented segments of the production on the learning of mythology.

The variables examined were as follows:

Independent — Level 1 - Animation  
Level 2 - Dramatic Representation  
Level 3 - No Treatment

Dependent — Level of learning attained as measured by a multiple-choice test on the content of the programs.  
— Attitude towards the programs as measured by a post attitude questionnaire.

Moderator — Level 1 - Male  
Level 2 - Female

Control — Grade six elementary school students  
Age 11 - 12 years  
Equal numbers of male and female subjects.

Animation and dramatic representation are the production variables manipulated in the two versions of the TV presentation. A production variable is any definable stimulus element which can be manipulated as a technique in an audiovisual program. Animation is the technique by means of which movement is given, on film, to a series of drawings representing them as alive. (Burchfield, 1972). Dramatic Representation refers to the technique of portraying a character, mood or idea, or narration by gestures and bodily movements. (Stein and Urdang, 1971).

## REVIEW OF THE LITERATURE

A review of the research material on educational television has adequately demonstrated that ETV can serve as an efficient tool of learning. The question to be asked is no longer whether students learn from television but rather, in a given situation, how can ETV be used effectively (Chu and Schramm, 1967). In contrast to the hundreds of studies reported in the literature which compare instructional television with conventional classroom teaching, there are very few studies specifically on the content and strategies of ETV (Schramm, 1972), and virtually no studies which investigate production variables such as animation and dramatic representation. The research that follows is therefore a synthesis of evidence from studies conducted in the area of Education, Psychology, and Film, which deal most closely with the thesis problem.

Freeman (1924), after systematic research of visual media in education, concluded that the value of a film lies not necessarily in its generally stimulating effect, but rather in its ability to furnish a particular kind of experience. It is unlikely that the film "experience" is precisely the same experience which television viewers have. However, there is no evidence which supports the superiority of one of these media over the other in their uses as instructional devices.

Fortunately, a considerable amount of research on instructional films seems to be applicable to television (Schramm, 1972). Both media have a visual channel which is selectively built up from separate

shots and which accentuates effective viewer responses. Film and television are similar in that both use animated pictures. Moreover, film can be transferred on a videotape and presented over television sets (Hilgard and Bower, 1966).

Animation: Although a number of studies have approached animation and its use in education, no conclusive results can be drawn. Richardson and Smith (cited in Hoban and Van Ormer, 1970), in their study of animation versus pamphlet presentation, indicated that in terms of a retention test after one month, the film method produced definitely higher percentages of gain in both junior and senior high school groups than did the pamphlet presentation. In other studies, Vestal and Fordham (cited in Schramm, 1972), found that animation did not produce greater learning in teaching, respectively, naval science in college and electronics in high school. However, Lumsdaine, Sulzer and Copstein (1953) did find some advantages in using animation for teaching military trainees. A possible explanation for the inconsistent evidence might be the different subject matters, the target audiences and scope. New (cited in Schram, 1972), reported that attention-getting devices in visual treatments add nothing to learning unless they introduce additional information.

Psychological research (Hilgard and Atkinson, 1967) led to the conclusion that our perceptions are selective. We do not react equally to all stimuli impinging upon us. Which specific stimuli will gain our attention depends upon a number of factors inherent in the stimulus pattern, as well as other factors having to do with our motivation. Other studies concerning attention (Kratwohl, 1966) suggested

that a more varied change in visual stimuli results in greater attention, due to greater viewer acquiescence in responding to visual stimuli. According to Aylward (1960), more efficient television communication could be achieved by utilizing production techniques which enhance viewer attention.

All of these outcomes appear to be in favor of the use of animation techniques to teach children. It is assumed that animation will help children to direct their attention to the salient and distinctive features of the material to be learned by making that material part of the visual action. As Lesser (1974, p. 113), notes, "Children direct their attention to visual action on television, ignoring whatever is not functionally related to that action. By animating abstract symbols (and even concepts if put in concrete visual form), these elements can participate as actors instead of being superimposed on the dramatic action as stationary bystanders."

Dramatic Representation: The power of drama to sharpen and give immediacy to information has not been fully explored in the educational world, largely because of the expense, time and trouble that is entailed in the production of even a simple skit. Television, by virtue of its ability to concentrate numerous resources on a single lesson, may stimulate the use of drama in teaching (Costello and Gordon, 1965).

The research which has been cited is the only available evidence relevant to the present study, which was intended to provide additional data regarding the effectiveness of these two different methods of presentation on learning by children.

## OBJECTIVES

### Educational Objectives

The main educational objective in designing a television program on Greek mythology was to facilitate knowledge acquisition of the content presented. The post program test, based directly on program content, included the first two categories of skills which Bloom (1956) classified under the cognitive domain: knowledge and comprehension. Following each presentation it was expected that students would be able to answer questions on the content of the program.

### Objectives of Evaluation

The primary objective of this study was to determine which of the two presentational strategies would maximize learning of specified material. The results of the study attempted to answer the following questions:

- a. Which of the two production variables is most effective in contributing to the greatest amount of information acquisition derived from the television programs?
- b. Which of the two methods engenders more favorable attitudes towards the TV programs?
- c. What is the effect of the sex variable on the information gain and attitudes toward the TV programs?

## HYPOTHESES AND RATIONALE

The following hypotheses were formulated:

HYPOTHESIS I: Ss viewing the TV presentation will achieve significantly higher learning scores than Ss not viewing the TV presentation.

HYPOTHESIS II: Ss presented with the animation version will achieve significantly higher learning scores than Ss presented with the dramatic representation version.

HYPOTHESIS III: Ss exposed to the animation version will show more favorable attitudes towards the program than Ss exposed to the dramatic representation version.

HYPOTHESIS IV: Sex difference in Ss will not produce significant interaction effects with treatment formats.

The above hypotheses were justified on logical and empirical grounds.

Since one of the criteria of content selection was the novelty of information, it was expected that the groups exposed to the television treatment would achieve higher test scores than the group not viewing the program.

The research discussed thus far in the literature indicated that there is a lack of evidence establishing a superiority of the one treatment over the other. However, the majority of the studies found



some advantage in using animation for teaching. In their studies on animation, Richardson and Smith (cited in Hoban and Van Ormer, 1970), and Lumsdaine, Sulzer and Kipstein (1953) did find some gain in learning and retention. Similarly, research on attention (Krathwohl, 1966) suggested that a more varied change in the pattern of visual stimuli (an element which characterizes animation) results in greater attention. Lesser (1974), after a year of naturalistic observation (Sesame Street), noted that children direct their attention to visual action on television. Animation, by its ability to put in concrete visual form abstract symbols and concepts, makes viewers participants in the visual action. The subject of mythology by definition is related to the unreal. Animation can keep this element while making it concrete and "real". Although dramatic representation performed by real actors gives immediacy to information, it does not create the same effect as animation. That is, it does not provide the same inspiration for the viewer's imagination to work. In light of the cited research and logical reasoning it was therefore hypothesized that the presentational method of animation would be more effective than the method of dramatic representation in facilitating cognitive acquisition, as well as in creating more favorable attitudes towards the program.

Since studies examining the relationship between presentation format and sex (Dwyer, 1972; Tam and Reeve, 1971) found no significant differences between sexes, no interaction effects between differential treatments and sex were expected.

## CHAPTER 2

### METHODOLOGY

#### SUBJECTS

##### Intended Target Audience

After consultation with elementary school teachers, it was decided that the grade six level represents an appropriate target audience for the content of the television program being investigated.

##### Sample Target Audience

The sample population consisted of 90 students drawn from three grade six classes of an elementary school in suburban Montreal: Elmwood Elementary School, St. Therese. The school is situated in a middle and upper middle class community. Thirty subjects were randomly assigned to one of two treatment groups and a control group. Each group contained an equal number of boys and girls. All Ss were between 11 - 12 years of age.

The three groups were exposed to the following treatments: Group I was exposed to treatment I (animation); Group II was exposed to treatment II (dramatic representation); Group III (control) had no treatment. All groups were administered the test covering the material presented. Groups I and II were also administered a test measuring their attitude towards the program to which they had been exposed.

## DESIGN

### PRODUCTION DESIGN

#### Content Selection

Choosing the topic of the programs was a matter of prime concern in deciding upon their potential design. The selection of the content for treatment analysis was based on the following criteria:

1. The subject had to be interesting and educative.
2. The content of the subject matter had to be at an appropriate level of apprehension for the target population.
3. The production should ideally present largely novel information to negate the effects of prior knowledge. After accounting for all of the above-mentioned criteria, the Greek Myth of Cosmogogenesis was chosen. One other basic consideration in the choice of Cosmogogenesis was that the myth consists of sequences which provided scope for adequate performance and animated movement to allow the study of both variables to be accomplished on an equal basis.

#### Brief Description of Content

At the beginning of all things, Mother Earth emerged from chaos and bore her son Heaven. Heaven fathered upon Mother Earth many children, all of which were strong and terrible giants having the power of Fire, Thunder, Earthquakes and Volcanos.

At one time, Heaven threw his rebellious sons, the Cyclopes, into Tartarus, a gloomy place in the underworld. In revenge, Mother Earth persuaded her other children, the Titans, to attack their father; they did so, led by Cronus, who surprised Heaven as he slept.

and wounded him badly. The Goddess Night in order to punish Cronus, gave birth to all the bad things in the world: Death, Murder, Misery, etc. From that time, people and gods would pay for Cronus' sin. Mother Earth prophesied that one of Cronus' sons would dethrone him. Every year, therefore, Cronus swallowed the children his wife Rhea bore him. Rhea was enraged. When she bore Zeus, her third son, she sent him away and gave Cronus a stone wrapped in cloth to swallow. Zeus was destined to dethrone Cronus and become the master of people and gods.

#### Production Techniques

Two versions of the television program of 19 minutes duration each were produced. The program was a narration accompanied by visual aids to illustrate the message presented. With the exception of the treatment segments concerning the variables under study, all the production techniques and the narration were held constant for each program. The animated segments inserted in the Treatment I program were replaced by the dramatically represented segments in the Treatment II version.

The following is a more detailed account of the actual construction of the program. This explanation is necessary in order to understand the rationale behind the testing and analysis. Since television enables the presentation of a linear series of temporal visual images accompanied by narration, it is relatively easy to separate and isolate them as instructional units. In other words, a temporal period within a program presenting specific information can be isolated. If the educational outcome as measured by a multiple choice test directly samples the information presented in the TV program segments under study, then the relationship between the two production techniques (animation and dramat-

ic representation) and the outcome may be directly established.

The entire program contained 4 minutes of scattered segments in the form of the production variables being examined. (See TV script, Appendix A). Each technique occurs in the same location in each of the two programs. A number of questions directly measures the information contained in the instructional segments. Another group of questions measures the information contained in the remainder of both programs. The placement of the treatment units was dictated by the needs of the subject matter of Cosmogénesis.

The original 4 minute, black and white, animated film (produced by the experimenter) was transferred to 1" video tape. The 4 minute dramatically represented sequences were recorded on 1" video tape. The first version of the program consisted of the constant part of the production and the inserted animated sequences. The second version consisted of the constant part of the production with the dramatically represented portions inserted in the same place as animated segments in the first version.

#### Rationale for Medium Selection

The choice of television was made on the basis of certain factors associated with this medium which served the intent of the present study. The widespread use of TV and the increasing advocacy for expanded future use, make television a powerful educational tool. Television can give an "all-at-once" total sensory input (Gillet, 1973). Repeated studies have shown that people tend to remember more from audiovisual than from any other kind of sensory stimulation. As Gillet (1973, p. 35) notes, "Retention rates calculated according to channel of information are roughly: reading-10 percent; hearing-18 percent; seeing-25 percent;

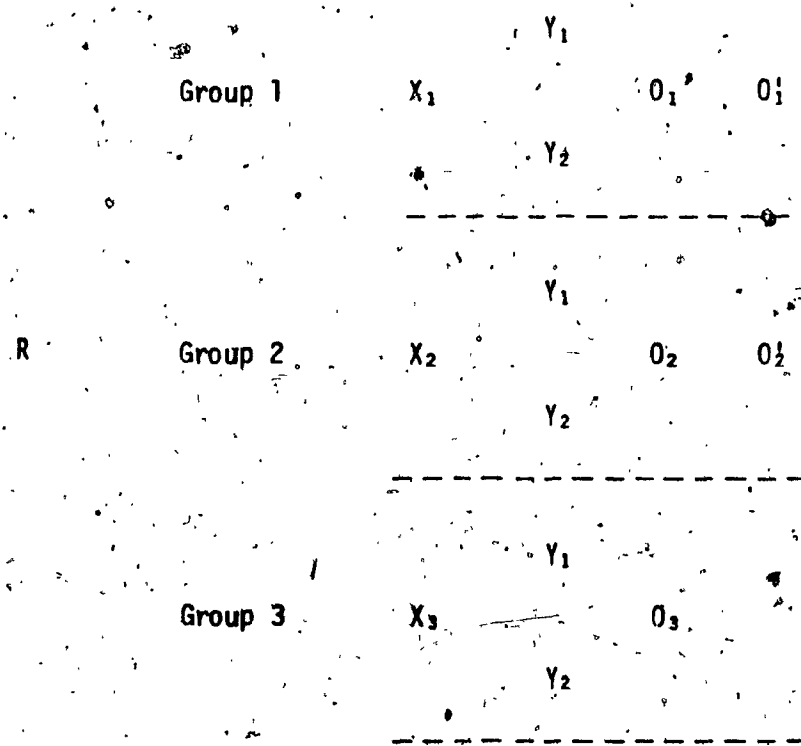
and seeing-hearing-48 percent". Television offers both sight and sound. Video tape recording, the basic equipment of TV, has proved to be a versatile tool. Any instructional technique (lecture, film, demonstration, dramatization, slides. . . .) can be transferred onto video tape. Because of these characteristics, television is able to challenge, to involve, to stimulate the child in a way different from any other medium. This, of course, is also one of the primary reasons that television has such great appeal to children (Rosen, 1967).

TV, with its many attributes, allows for the subject matter of this study, Mythology, to be presented in a versatile way. Moreover, it enables the testing of the differential effects of the instructional strategies employed by keeping part of the production technique constant.

#### RESEARCH DESIGN

The research design employed was a post-test-only control group design modified into a factorial design which controls for all sources of internal validity and most sources of external validity (Campbell and Stanley, 1963). Figure 1 illustrates the post-test-only control group factorial design with randomly assigned groups R, three levels of the independent variable X (two presentation treatments plus control group), two levels of the moderator variable Y (males versus females) and two observations measuring the effect of the independent variable on the dependent variable. O (level of learning attained as a result of being exposed to the different treatments) and O' (attitude towards the program).

FIGURE 1 -- RESEARCH DESIGN



Key

- R - randomization of subjects to treatments
- X - treatment
- O, O' - appropriate observation
- X<sub>1</sub> - animation
- X<sub>2</sub> - dramatic representation
- X<sub>3</sub> - control group--no treatment
- Y<sub>1</sub> - male subjects
- Y<sub>2</sub> - female subjects

## PROGRAM EVALUATION

Prior to testing, both treatment programs were evaluated by a committee of experts in terms of quality, comparability and suitability for the intended target audience. It was decided that both programs were comparable as to quality and difficulty level.

A multiple choice test covering the content of the television programs was constructed by the experimenter to measure cognitive acquisition of the information presented. The original 35-item questionnaire was comprised of 19 questions pertaining to the treatment units and 16 questions pertaining to the remainder of the program. These two categories of questions were interspersed throughout the test. Items were numbered from 1-35. (See Appendix B). The questions measured whether the production techniques used in the treatment units contributed significantly to learning.

Additionally, seven positive statements and seven negative statements dealing with attitudes towards the TV programs were developed and combined to form a 14-item questionnaire. (See Appendix B). The students were asked to complete the questionnaire by indicating their agreement or disagreement with each of the statements on a 5-point Likert scale (Tuckman, 1972).

Prior to the actual scoring of the experimental results, both the information acquisition and the attitude questionnaires were tested to determine if they possessed the required reliability and validity. The scores of the group exposed to animation were randomly chosen to determine the reliability of the questionnaires.

Reliability of the information acquisition questionnaire was determined by computing item discriminability and item difficulty. Of



the 35 items, 6 were discarded since they did not meet the criteria of acceptance (See Appendix C). The measurement of the acquisition of the information was thus based on the students' performance on the remaining 29 items. Two of the discarded questions (9, 27) were drawn from the treatment units; the remaining four (1, 13, 25, 28) were drawn from the remainder of the program. The overall results of the information acquisition questionnaire revealed a Kuder-Richardson<sub>21</sub> reliability coefficient of .83 (Appendix C).

The split-half reliability method was employed to determine the reliability of the attitude questionnaire. The Spearman-Brown formula was used to calculate this reliability. The correlation coefficient between the two sets of scores was calculated according to the method given in Gronlund (1968) (See Appendix C). The overall results of the attitude questionnaire revealed a reliability coefficient of .68 which was within the acceptable range (.60 - .80) for classroom tests (Gronlund, 1968).

### TESTING PROCEDURE

The sequence of the testing procedure was as follows:

1. Students enrolled in grade six classes were randomly assigned to three treatment groups.
2. The experimental treatments took place in similar classrooms.
3. The experimental treatment was completed during one 50 minute class period.
4. A television monitor and Sony 3/4 inch video tape recorder were provided in the classroom.

5. Two experimenters were present in each classroom. The subjects were provided with information as to the nature of the experiment.
6. The program I (Treatment I - Animation) was viewed by Group I. Upon completion of the program, all subjects were administered the criterion test and the attitude test. The same procedure was repeated for Group II (Treatment II - Dramatic Representation). The control group completed the criterion test without watching the program.
7. The criterion test and the attitude questionnaire were scored by the experimenter.

#### ANALYSIS OF DATA

Marginals were first generated to produce means and standard deviations for all groups. A two way analysis of variance with 3 levels of the independent variable (two experimental treatments plus control) and two levels of the moderator variables (male and female Ss) was employed to determine the effects of the experimental treatments on

- a. the 29 item total information acquisition measure, and
- b. the 17 item treatment units information acquisition measure.

A two way analysis of variance with one independent variable with two levels (treatments) and one moderator (sex), was employed to determine if any difference existed between groups on the attitude questionnaire measure. If the analysis of variance suggested a significant difference between means, the means were then further analyzed using the Tukey multiple comparison method (Glass and Stanley, 1970) to determine the direction of the differences.

An F ratio with  $p < 0.01$  is the level required for significance for all reported data.

## PRODUCTION AND RESEARCH REQUIREMENTS

### PRODUCTION REQUIREMENTS

The animated film and the TV programs were produced in the facilities provided by Concordia University.

The production of the animated film required the following equipment and materials:-

- 16 mm Animation Camera
- 200 feet, 16mm, black and white film
- 1500 drawings on acetate sheets for animation
- Graphic materials

The following resources were employed for the production of the television programs:

- Sound recording studio for sound recording and synchronization, audio tapes, and music
- TV production studio for the recording of the programs
- TV studio operators
- Visual aids (89 slides, dry ice, film)
- Graphic materials
- Materials for costumes and sets
- Actors
- Scripts with the content and directive instructions

# RESEARCH REQUIREMENTS

For the playback of the programs in the schools and the measurement of their effect the following resources were required:

- A TV monitor connected to a video tape machine
- Two 3/4" ELAJ U/MATIC Cassettes with duplicates, of the original program
- Multiple choice tests covering the content of the program
- Questionnaires for the measurement of the attitudes towards the program.

## COST

The final cost of the production and testing expenses was estimated to be \$665.00.

Film and processing. . . . .	\$ 65.00
Acetate sheets for animation. . . . .	250.00
Acrylic colors for animation. . . . .	50.00
Graphic materials. . . . .	60.00
Costumes and sets. . . . .	60.00
Slides. . . . .	55.00
Audiotapes. . . . .	10.00
Scripts. . . . .	20.00
Questionnaires. . . . .	15.00
Two 3/4" cassettes with duplicates of the program . . . . .	70.00
	<u>\$ 665.00</u>

## CHAPTER 3

### RESULTS

#### EFFECTS OF DIFFERENTIAL TREATMENTS ON THE TOTAL INFORMATION ACQUISITION MEASURE

The number of subjects in each of the three groups was 30. The means and standard deviations on the total information acquisition measure for the two treatment groups and the control group ( $N = 90$ ) are shown in Table 1 (see Appendix D for raw scores).

TABLE 1  
MEANS AND STANDARD DEVIATIONS FOR THE TWO TREATMENT GROUPS AND THE CONTROL GROUP IN THE TOTAL INFORMATION ACQUISITION MEASURE

Groups	n	Mean	Standard Deviation
Control	30	9.23	3.62
Animation	30	14.40	6.36
Dramatic Representation	30	13.40	4.77
TOTAL	90		

Table 2 illustrates the results of the two way analysis of variance for the treatment and control groups on the total information acquisition measure. The analysis of variance revealed significant overall effects between the three groups. No significant difference was found between sexes.

TABLE 2  
TWO WAY ANALYSIS OF VARIANCE OF THE TOTAL INFORMATION ACQUISITION MEASURE

Source of Variation	df	Mean Square	F	p
Treatment (A)	2	225.27	8.96	<0.01
Sex, (B)	1	3.21	0.12	NSD
A x B	2	2.74	0.10	NSD
Within Cells	84	25.14		

Note: NSD = No significant difference.

The Tukey multiple comparison procedure was employed to determine which means were, in fact, significant. The results shown in Table 3 are based on the following formula (see Appendix E).

$$(\bar{X}_{i...} - \bar{X}_{j...}) \pm 1 - \alpha^{qI.N} \pm IJ \sqrt{\frac{MS_w}{N/I}}$$

TABLE 3

APPLICATION OF THE TUKEY METHOD TO DETERMINE SIGNIFICANT DIFFERENCES BETWEEN THREE GROUP MEANS ( $p < 0.01$ ) (Total Information Acquisition Measure)

Differences Between Means	$1-\alpha^9 I, N-1 J \sqrt{\frac{MS_W}{N/I}}$	Confidence Interval	p
$\bar{X}_1 - \bar{X}_3 = 5.17$	$4.25 \sqrt{\frac{25.14}{90/3}} = 3.89$	(1.28, 9.06)	<0.01
$\bar{X}_2 - \bar{X}_3 = 4.17$	3.89	(0.28, 8.06)	<0.01
$\bar{X}_1 - \bar{X}_2 = 1.00$	3.89	(-2.89, 4.89)	NSD

Note:  $\bar{X}_1$  = Animation treatment mean

$\bar{X}_2$  = Dramatic Representation treatment mean

$\bar{X}_3$  = Control Group mean

NSD = No significant difference

The application of the Tukey test indicated the following:

1. The two experimental treatment means were significantly different from the means of the control group.
2. There was no significant difference between the means of the two treatment groups (animation versus dramatic representation).

## EFFECT OF THE TREATMENT UNITS ON INFORMATION ACQUISITION

The means and standard deviations on the treatment units (17 item) information acquisition measure for the two treatment groups and the control group are shown in Table 4 (see Appendix D for raw scores).

TABLE 4  
MEANS AND STANDARD DEVIATIONS OF THE TREATMENT UNITS INFORMATION ACQUISITION MEASURE

Groups	n	Mean	Standard Deviation
Control	30	5.33	2.53
Animation	30	8.13	3.99
Dramatic Representation	30	7.16	2.76
TOTAL	90		

Table 5 illustrates the result of the two way analysis of variance for the two treatment groups and the control group on the treatment units information acquisition. The analysis of variance revealed significant overall effects between the three groups. No sex differences were found.



TABLE 5

TWO WAY ANALYSIS OF VARIANCE OF THE TREATMENT UNITS INFORMATION ACQUISITION MEASURE

Source of Variation	df	Mean Squares	F	p
Treatment (A)	2	60.67	5.87	<0.01
Sex (B)	1	5.87	0.56	NSD
A x B	2	4.07	0.39	NSD
Within Cells	84	10.32		

Note: NSD = No significant difference.

Since a significant difference between the three groups was found, the Tukey test was applied to all means to determine which means were in fact significant ( $p < 0.01$ ). The results shown in Table 6 are based on the formula:

$$(\bar{X}_i - \bar{X}_{i*}) \pm 1 - \alpha^{qI, N-1J} \sqrt{\frac{MS_w}{N/I}} \quad (\text{see Appendix E}).$$

TABLE 6

APPLICATION OF THE TUKEY METHOD TO DETERMINE SIGNIFICANT DIFFERENCES BETWEEN THREE GROUP MEANS ( $p < 0.01$ ) (Treatment Units Information Acquisition Measure)

Differences Between Means	$t_{\alpha, N-1} \sqrt{\frac{MS_w}{N/I}}$	Confidence Interval	p
$\bar{X}_1 - \bar{X}_3 = 2.8$	$4.25 \sqrt{\frac{10.32}{90/3}} = 2.49$	(0.31, 5.29)	<0.01
$\bar{X}_2 - \bar{X}_3 = 1.83$	2.49	(-0.66, 4.32)	NSD
$\bar{X}_1 - \bar{X}_2 = 0.97$	2.49	(-1.52, 3.46)	NSD

Note:  $\bar{X}_1$  = Animation treatment mean  
 $\bar{X}_2$  = Dramatic Representation treatment mean  
 $\bar{X}_3$  = Control Group mean  
 NSD = No significant difference.

The direction of the difference shown by the Tukey test indicated the following:

1. The group exposed to animation achieved significantly higher scores than the control group.
2. Although the mean score achieved by the group exposed to dramatic representation was higher than that attained by the control group, this difference was just short of being statistically significant.

3. No significant difference was found between the means of the two experimental treatment groups.

### ATTITUDE MEASURE TOWARDS THE PROGRAM

The means and standard deviations of the Treatment I (animation) and Treatment II (dramatic representation) groups on the attitude measure are presented in Table 7 (see Appendix D for raw scores).

TABLE 7

MEANS AND STANDARD DEVIATIONS FOR THE TWO TREATMENT GROUPS' ATTITUDE MEASURE TOWARDS THE PROGRAM

Group	n	Mean	Standard Deviation
Animation	30	59.10	4.95
Dramatic Representation	30	50.23	8.05
TOTAL	60		

Table 8 illustrates the results of the two way analysis of variance. The analysis of variance revealed significant overall effects ( $p < 0.01$ ) between the two groups in favor of the animation treatment. No significant difference was found between sexes.

TABLE 8

TWO WAY ANALYSIS OF VARIANCE OF THE ATTITUDE TOWARDS THE PROGRAM

Sources of Variation	df	Mean Squares	F	p
Experimental Treatments (A)	1	1179.26	25.86	<0.01
Sex (B)	1	11.26	.247	NSD
A x B	1	106.66	2.33	NSD
Within Cell	56			

Note: NSD = No significant difference.

## CHAPTER 4

### CONCLUSIONS AND DISCUSSION

The purpose of this study was to assess the differential effect two presentational methods in educational television, namely animation and dramatic representation, had on viewers' cognitive acquisition of the material presented, as well as on viewers' attitudes towards the production techniques.

The discussion and conclusions which follow are organized around the points raised in the hypotheses formulation.

#### CONCLUSIONS

The findings in this study led to the following conclusions:

##### A. Total Information Acquisition Measure

1. Both experimental groups achieved significantly higher mean scores than the control group
2. No significant difference was found between the means of the two experimental groups
3. No difference was found between sexes.

##### B. Information Acquisition Measure on the Treatment Units

1. The group exposed to animation treatment achieved a signif-

- icantly higher mean score than the control group. No significant differences were found between the group exposed to dramatic representation and the control group.
2. There was no significant difference between the means of the two experimental groups.

C. Attitude Measure Towards the Program

1. A statistically significant difference was found between the means of the two experimental groups in favor of the group exposed to animation.
2. No significant differences were found between sexes.

In sum, although no significant difference in information acquisition was found between the two experimental treatment groups, the higher mean score achieved by subjects exposed to the animation treatment suggested that it was more effective than the dramatic representation. The results obtained from the attitude measure were clearly differentiated. The animation treatment was significantly more effective than the dramatic representation as a stimulating presentational strategy.

DISCUSSION

*Hypothesis I:* Ss viewing the TV presentation will achieve significantly higher learning scores than Ss not viewing the TV presentation.

The findings of this study affirm hypothesis I. The results indicated that both experimental groups achieved significantly higher scores than

the control group on the total information acquisition measure ( $p < 0.01$ ). It can therefore be concluded that for the particular grade six elementary school students involved in the study, the TV programs were effective. However, the experimenter felt from observing the students' reactions before, during and after watching the program, that the subjects' attitude towards the topic of the program influenced the results of the research. Due to the nature of the program, which contained many unfamiliar names and characters, the subjects may have experienced difficulty in relating to it. The question then arises as to what extent viewer's predisposition towards a topic influences outcomes. More specifically, it would be worthwhile to investigate the differences between learning outcomes of Canadian students and those of Greek students--the latter being familiar with and positively predisposed to Greek mythology.

As was indicated by the mean scores obtained for the group exposed to the dramatic representation and the control group on the 17 item treatment units information acquisition measure, the dramatic representation was somewhat more effective than the control group. However, the difference between means was just short of being statistically significant. A possible explanation for this may be the unexpectedly high level of achievement attained by the control group in all measures. Although chance might account for a portion of this observation, the high mean score of the control group cannot be justified on a chance basis alone. Since Ss prior knowledge is the most probable explanation for the observation, the present investigator has to accept that the original assumption about the novelty of the information presented was incorrect.

*Hypothesis II:* Ss presented with the animation version will achieve significantly higher learning scores than Ss presented with the dramatic representation version.

Although it was expected that the TV program containing the animated segments would be more effective than the dramatic representation version, this did not occur. Results for both the total and the treatment units information acquisition measures showed that there was no significant difference between the means of the two experimental groups ( $p < 0.01$ ). Although there was no significant difference between the animation and the dramatically represented versions, the mean score of the animated version did suggest that it was more effective than the dramatized version.

The results of the study indicate that for this particular experimental situation and within its limitations there is no significant difference between the two presentational methods. Whether the same materials would produce equivalent results with different populations is not known; nor is it known whether the same results would occur if the television programs were produced with professional standards cost.

*Hypothesis III:* Ss exposed to animation version will show more favorable attitudes towards the program than Ss exposed to dramatic representation version.

The results of the attitude measure clearly showed a significant difference between the means of the group exposed to the animation version and the group exposed to the dramatic representation version in favor of the former ( $p < 0.01$ ). Although viewer enjoyment and overall evalu-



tion of the TV presentation favored the animated version, it did not result in greater learning of the subject matter presented (hypothesis II). This suggests that despite the fact students may enjoy a particular program, they do not necessarily learn more from this program than from one which they enjoy less. The above is consistent with research in this area (Cassirer, 1960) which provides evidence that there is no causal relationship between attitude towards a program and learning from that program. As Dwyer (1972) notes, students' perception of the value of different types of visual illustrations are not valid assessments of their instructional affectiveness: that is, aesthetically pleasing visuals may be deceptive in their instructional value. From a logical point of view nevertheless, it would seem that a favourable attitude towards a program would facilitate learning.

*Hypothesis IV:* Sex differences in SS will not produce significant interaction effects with treatment formats.

As it was expected, no significant differences were found between sexes. Therefore, it is suggested that the experimental treatments were equally effective for both sexes. The finding is consistent with conclusions drawn from studies by Dwyer (1972) and Tam and Reeve (1971) who note that boys and girls in the same grade level learn equally well from identical types of visual illustrations.

## RECOMMENDATIONS FOR FUTURE RESEARCH

The lack of empirical research in the use of animation and/or dramatic representation as presentational methods in educational television, clearly indicates a need for more systematic research in this area.

Since the differences between the scores on the two treatment units are negligible, it is suggested that the study be replicated using a larger population. Replication is also required at different age levels, as well as with different types of television programs. It is suggested that if the time of exposure to the TV presentation, which contained much new information, was reduced, learning would have been facilitated. It would also be interesting to determine if the same results would be obtained with a topic other than Greek Mythology. The effects of the various ways of producing drama in TV should also be explored. Equally valuable would be the study of the varied animation techniques and their effects on learning.

Since the use of visualization increases the cost of education consequently it is necessary that future researchers critically examine those aspects of the instructional programs that contribute significantly to increased cost in order to verify that their presence is justified in terms of increased student achievement.

## SUMMARY

The television production variables which were examined in this study were animation and dramatic representation. Animation refers to the technique by which movement is given, on film, to a series of

drawings representing them as alive. Dramatic representation refers to the technique of portraying a character or narration by gestures and bodily movements.

The purpose of this study was to compare the differential effect, if any, of the animated versus the dramatically represented units of the production on the learning of Greek mythology. The primary objective of the study was to determine which of the two presentational strategies would facilitate higher learning of specified material among children.

Although there was a lack of empirical evidence establishing a superiority of the one treatment over the other, the majority of the studies investigated, suggested some advantage in using animation for teaching. Evidence also suggested that a more varied change in the pattern of visual stimuli (an element which characterizes animation) increases viewers' attention. Observations indicated that children direct their attention to visual action in television. It was also noted that the technique of animation is able to bring to the child the unreal elements of a situation by making them concrete and real participants of the visual action. Due to the nature of the subject of mythology, it was hypothesized that the presentational method of animation used in this study would be more effective than the strategy of dramatic representation.

Among the number of myths in the broad subject of the Greek mythology, the myth of Cosmogonesis was chosen on the basis of attributes which provided the necessary conditions for the study of both variables. The television program was produced by the experimenter. Two versions of 19 minutes duration each were produced. With the exception of the

treatment segments all the production techniques and the narration were held constant for each program. The animation segments inserted in the Treatment I program were replaced by the dramatic representation segments in the Treatment II version. Each of the two methods of presentation occupied 4 minutes of the program.

A multiple choice test covering the content of the television program was constructed by the experimenter ( $KR_{21} = .83$ ). A five point scale, 14 item, questionnaire measuring attitudes towards the programs was also constructed containing a reliability coefficient of .68.

Ninety grade six elementary school students were randomly assigned to two experimental treatment groups and one control group. Each treatment group viewed only one TV version. The information acquisition questionnaire was administered to all of the three groups. Marginals were generated for all data to produce means and standard deviations for all groups. Three two way analyses of variance were employed respectively for the total and the treatment units information acquisition measure as well as the attitude towards the program.

Results revealed significant overall differences between groups in terms of cognitive acquisition. All experimental treatments were shown to be superior to the control group. Comparison of the differential effects of the two experimental treatments did not reach the desired level of significance. A significant difference was found ( $p < 0.01$ ) between the Treatment I (animation) group and Treatment II (dramatic representation) group on the attitude towards the program measure in favor of the animation version. No significant differences were found between sexes.

Suggestions made for future investigation indicated that due

to lack of empirical research in the use of the variables under study as presentational methods in educational television, further systematic research is necessary. A replication of the present study is required with a different audience. Replication is also required with different types of TV programs in terms of duration and subject matter presented. The effects of the various ways of producing drama in TV, as well as the effects of the varied animation techniques should also be studied.

In sum, the contribution of this research has been to demonstrate the effects which visual production variations such as animation and dramatic representation may produce. As Coldevin (1977, p. 92), notes, "We have now reached a stage where 'rules of production' developed largely through intuition and past experience should be accompanied by 'rules of effectiveness' if the medium is to consistently improve its ability to foster a desired impact."

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APPENDIX A

## SCRIPT SYMBOLS AND ABBREVIATIONS

C - The letter C followed by an arabic numeral designates the camera number, e.g. C1 : Camera 1

x - Mix from one visual to another visual.

X - Switch to a visual.

T/C - Visual switch to a slide or a film.

Sup. Imp. - Super imposition of one visual over another.

SCRIPT

2

COSMOGENESIS

by

Sophia Eliadis

2

MARCH, 1977

3

VIDEO

AUDIO

SHOT

1. CAM. 3 BOOK

UP MUSIC

(MUSIC BEGINS TO FADE OUT WHEN PAGE STARTS

TURNING AND FADES OUT COMPLETELY WHEN IT

TURNING) UP TAPE.

NARRATION: Many years ago, when the

2. x TO CAM. 1 SLIDE 1 world was young,/ man's life was dominated

3. X TO T/C SLIDE 2 by all powerful Nature./ Living was dif-

4. X TO CAM. 1 SLIDE 3 ficult and painful./ Changes were hap-

5. x TO T/C SLIDE 4 pening around him /

6. x TO CAM. 1 SLIDE 5

7. x TO T/C SLIDE 6

8. x TO CAM. 1 SLIDE 7

9. X TO T/C SLIDE 8

10. X TO CAM. 1 SLIDE 9 which at times scared him,/at other times

11. X TO T/C SLIDE 10 astonished him /or. made him happy.

12. X TO CAM. 1 SLIDE 11

Man wanted to make his life easier and

more predictable, so he searched for the

VIDEO

AUDIO

SHOT

13. SUP. IMP. SLIDE 12 causes of these changes./
14. LOSE SUPER His imagination created rich fantasies/
15. SUP. IMP. SLIDE 13 of marvelous beauty and wondrous/  
sentiments. This was the beginning of
16. x to T/C; SLIDE 14 Man's mythology./  
The most beautiful myths of the old  
people were created in a place called  
Greece. The first thing the Greeks  
wanted to find out was where the world
17. SUP. IMP. T/C TO CAM. 1 and mankind came from./  
(SLIDE 15) WHILE ZOOM IN  
LOSE SUPER  
So the myth of the creation of the world
18. x CAM. 3 SLIDE 16 or as these people called it the myth/
19. x TO CAM 1 (DRY ICE) of Cosmogogenesis came in to being./  
To find the beginning of the story we  
must go back countless years and centu-  
ries. We have to make a journey back in  
time searching for the beginning of all
20. x TO T/C SLIDE 17 things./



VIDEO

AUDIO

SHOT

In that distant era, the only being in  
life was a god called chaos. There was  
nothing around him. No sun, no light,  
no earth, no sky. There was nothing

21. X TO CAM. 1 SLIDE 18 but chaos. Time passed./ God chaos, tired  
of living by himself, decided to create

22. X TO T/C ANIMATED FILM the world./

In the beginning, Mother earth emerged  
from chaos. She was a beautiful goddess  
full of life and power. She grew up,  
stretched her arms and became the base

23. X TO CAM. 1 SLIDE 19 of the world./

Next, chaos created the dreadful Tartarus  
his kingdom was a gloomy place in the  
underworld, which lies as distant from  
the earth as the earth from the sky;  
it would take a falling stone nine days

VIDEO

AUDIO

SHOT

24. X TO T/C SLIDE 20 to reach its bottom./ Next, from chaos

25. X TO CAM. 1 SLIDE 21 sprang the luminous day/

26. X TO T/C ANIMATED FILM and the dark night./

The goddess Night spends her day in her  
palace in the heart of Tartarus and when  
the evening approaches she rises from

27. X TO T/C SLIDE 22 Tartarus and spreads over the earth./

Mother earth helped in the creation of

28. x to CAM. 1 SLIDE 23 the world./

She gave birth to love, the goddess who  
brought to the world the beauty of life.

Then, Mother earth bore Heaven, the most

29. X TO T/C ANIMATED FILM powerful/of all gods. Heaven governed

the world, sitting on a golden throne up

on the clouds. Gazing down fondly at

Mother earth, Heaven showered fertile

rain upon her.. She bore grass, flowers,

VIDEO

AUDIO

SHOT

30. X TO T/C SLIDE 24 trees, beasts and birds./

This same rain made the rivers flow  
and filled the hollow places with water,  
so that lakes and seas were formed.  
Father Heaven gave Mother earth many  
more children.

31. X TO T/C ANIMATED FILM The most terrible children/born by

Mother Earth were the Hundred-handed ones.  
They were tall and terrible giants each  
with one hundred hands. They were so  
strong that they could lift up rocks  
the size of mountains and without warn-  
ing they would hurl them downwards on  
the earth and make the earthquakes.  
Other children of Heaven and Mother  
earth were the Cyclopes; the tall and  
terrible giants who had only one eye

VIDEO

AUDIO

SHOT

in the middle of their forehead. They  
lived high in the mountains, masters  
of powerful fire, lightning and thunder.  
Whenever the Cyclopes wandered about  
the mountains the earth was shaken by

32. X TO CAM. 1 SLIDE 25 lightning and thunder./

Last came the Titans. They were equal  
to the others in size and strength but

33. X TO T/C SLIDE 26 they were not so destructive./ At one

time, the Cyclopes revolted against

34. X TO T/C ANIMATED FILM their own father./

Heaven, hurt and angry, decided to  
punish them. Mother earth realizing  
how angry Father Heaven was knelt in  
front of him and asked him to forgive  
them.

VOICE: "My Lord and Lord of the world

VIDEO

AUDIO

SHOT

I beg of you, don't punish our children."

VOICE: "Mother of Gods, when children

don't respect their father and revolt

35. X TO CAM. 1 SLIDE 27 against him they should be punished."/

As soon as he finished these words,

Heaven threw his rebellious sons the

Cyclopes, in to Tartarus, that gloomy

36. X TO T/C SLIDE 28 place in the underworld./

Mother Earth suffered at the thought of

her children being in Tartarus. So she

persuaded the Titans to attack their

father and take his throne from him.

37. X TO T/C ANIMATED FILM They did so led by Cronus /the youngest

of the Titans. Cronus, armed with a

flint sickle, hid inside a cloud wait-

ing for the right time to approach his

father. He surprised the sky as he

VIDEO

AUDIO

SHOT

slept and with the flint sickle he  
wounded him badly. As soon as he had  
completed his task, darkness spread  
all about and lightning and thunder  
shook the world. Heavens' voice sounded  
like a roar. VOICE: "A curse be on  
you, what you did to your father  
will befall you at the hands of

38. X TO CAM. 1 SLIDE 29 your children./ One of your sons will

dethrone you."

Cronus didn't pay attention to Heaven's  
curse for he was very happy that he had  
achieved his goal. He knew that he had  
nothing to be afraid of. His father  
was unable to rule the world and moreover  
he was incapable of having children

39. X TO T/C SLIDE 30 because he was wounded badly./ From

VIDEO

AUDIO

SHOT

- that time, and for untold ages, Cronus
40. X TO CAM. 1 SLIDE 31 was the lord of the universe./ To main-  
tain his power, Cronus decided to keep  
the Cyclopes and the Hundred-Handed ones
41. X TO CAM. 3 PAGE TURNS in Tartarous./ However, Cronus' happiness  
was not to last long. He would pay for  
his sin. His reign, based on such a  
wicked action, became the cause of all
42. X TO T/C SLIDE 32 the evil in the world./  
The goddess Night in order to punish
43. X TO CAM. 1 SLIDE 33 Cronus, gave birth to many terrible gods:/
44. X TO T/C SLIDE 34 Old Age,/ )
45. X TO CAM. 1 SLIDE 35 Death,/
46. X TO T/C SLIDE 36 Murder,/
47. X TO CAM. 1 SLIDE 37 Sleep,/
48. X TO T/C SLIDE 38 Nightmare,/
49. X TO CAM. 1 SLIDE 39 Misery,/

VIDEO

AUDIO

SHOT

50. X TO T/C SLIDE 40 Fear, /

51. X TO CAM. 1 SLIDE 41 Anger, /

52. X TO T/C SLIDE 42 Quarrel, /

and the three Furies which pursue and

53. X TO CAM. 1 SLIDE 43 punish sinners. /

Now the powerful Cronus was very scared.

He was not sure any more that his reign

would last forever. He was ruling in a

world full of fear, fraud, hate, agony,

54. X TO T/C SLIDE 44 revenge and wars. /

Cronus started thinking of the curse his

father gave him. VOICE: "One of your

55. X TO CAM. 1 SLIDE 45 sons will dethrone you." / He was so

shaken with fear that he made a terrible

decision. Every year he swallowed the

56. X TO T/C SLIDE 46 children his wife Rhea bore him. / Rhea

was desperate. When she bore Zeus, her



VIDEO

AUDIO

SHOT

sixth child, she sent him away to save

57. X TO CAM. 1 SLIDE 47 him from his father's madness. / Instead

of Zeus she gave Cronus a stone wrapped

58. X TO T/C SLIDE 48 in clothes to swallow. / Zeus was carried

by Mother earth to Crete. Mother earth

left him to be nursed by the

59. x CAM 3 BOOK nymphs of the mountains. / In these dif-

ficult years of Cronus' reign when evil

first appeared in the world, the birth

of Zeus was thought of as the birth of

hope and the beginning of a struggle

60. x T/C for a better world. /

Everybody expected Zeus to save the world.

61. x TO CAM 1 (SLIDE 49) Everybody loved Zeus. / Around the infant's

HALFRAY

cradle, stood the sacred King's armed

companions. They clashed their spears

against their shields and shouted loud

VIDEO

AUDIO

SHOT

to drown out the noise of his wailing

62. X TO CAM. 3 SLIDE 50 in case Cronus might hear it from afar./

63. X TO CAM. 1 SLIDE 51 The Nymphs took special care of him./

The animals of the forest loved the

64. X TO T/C SLIDE 52 little god./ The birds sang

65. X TO CAM. 1 SLIDE 53 for him./ The bees brought him their

66. X TO T/C SLIDE 54 honey./ And the sacred goat Amalthea

67. X TO CAM. 1 SLIDE 55 fed him./

Zeus grew older. Now he had another

friend; the wise eagle. They loved

68. X TO T/C SLIDE 56 each other./ The wise eagle told Zeus

69. x to CAM. 1 SLIDE 57 marvelous stories/ about the places

70. x to T/C SLIDE 58 to which he had travelled/ and the things

71. X TO T/C SLIDE 59 he had seen./

Zeus grew to manhood. He became a

72. X TO T/C SLIDE 60 beautiful strong and brave young man./

It was then that the wise eagle talked

VIDEO

AUDIO

SHOT

73. X TO CAM. 1 SLIDE 61 to him about his father Cronus./ Zeus  
was first astonished by the news for  
he knew nothing about his past. This
74. X TO T/C SLIDE 62 astonishment/ turned to anger against  
his father Cronus. He made a decision  
to rescue his brothers and sisters and
75. X TO CAM. 1 SLIDE 63 dethrone Cronus./
76. X TO T/C SLIDE 64 So he left Crete his only known home./  
Beside the ocean stream, Zeus met Metis,  
the daughter of the ocean, who helped
77. X TO CAM. 1 SLIDE 65 him to take revenge./ She provided him  
with a special drink and told him to  
mix it with Cronus' honey drink. That.
78. X TO T/C SLIDE 66 way Cronus would vomit up his children./  
Zeus visited his mother Rhea and asked
79. X TO CAM. 1 SLIDE 67 her to hire him as Cronus' cup-bearer./

VIDEO

AUDIO

SHOT

- A day ~~time~~ when Zeus mixed the special
80. X TO T/C SLIDE 68 drink with Cronus' honey drink./ Cronus  
having drunk deep, vomited up first the  
stone, and then Zeus' elder brothers  
81. X TO CAM. 1 SLIDE 69 and sisters./ They sprang out unhurt  
and asked Zeus to lead them in a war  
82. X TO T/C SLIDE 70 against their father and the other Titans./  
The war lasted for ten years. Zeus and  
his brothers were not alone in their  
struggle against the Titans. The god-  
desses of Victory, of Work and Peace were  
83. X TO CAM. 1 SLIDE 71 on their side./  
84. X TO T/C SLIDE 72 Zeus was also helped by the Cyclopes  
and the Hundred-handed ones, whom Cronus  
85. X TO CAM. 1 SLIDE 73 had confined in Tartarus./ The Cyclopes  
86. X TO T/C SLIDE 74 gave Zeus the Thunderbolt as a weapon/  
and the Hundred-handed ones took up rocks

VIDEO

AUDIO

SHOT

- and pelted the Titans. The Titans were
87. X TO CAM. I SLIDE 75 -beaten. The war was over./ When all  
the enemies of love and peace were  
conquered, Zeus and his brothers and  
sisters went to live in a palace on top  
88. X TO T/C SLIDE 76 of Mount Olympus./ After so many years  
of war, a war that almost wrecked the  
universe, they had a lot of work to do.
89. X TO CAM. 1 SLIDE 77 As yet,/ there were no human beings, but  
the world now cleared of the evil, was  
ready for mankind. Mother earth bore  
90. X TO T/C ANIMATED FILM men /spontaneously. Man -- the most  
91. X TO T/C SLIDE 78 perfect of her creations./  
For a long time people lived in comfort,  
92. X TO CAM. 3 BOOK peace and security./  
PAGE TURNS  
As the generations passed, evil times  
came. Man's nature changed. The good

VIDEO

AUDIO

SHOT

ceased to be. Man had no rest from toil  
and sorrow. Children grew worse than  
their parents. A time came when men  
had grown so wicked that they worshipped

93. x TO CAM. 1 SLIDE 79 power./

Zeus, the father of gods and men, from  
his throne up on Mount Olympus could see

94. X TO T/C SLIDE 80 everything which happened on the earth./

In order to protect people from destruc-

95. X TO CAM. 1 SLIDE 81 tion Zeus decided to make the laws./

96. X TO T/C SLIDE 82 The goddesses of Justice,/

97. X TO CAM. 1 SLIDE 83 Peace,/

98. X TO T/C SLIDE 84 Victory,/

99. X TO CAM. 1 SLIDE 85 and Love helped him./

When men do not obey his laws, when

they work against the peace and order

VIDEO

AUDIO

SHOT

100. X TO T/C SLIDE 56 of the world, Zeus gets very angry./
- Then the sky is covered by black clouds and thunder and lightning shook the earth. In that way Zeus shows his power and reminds people of his divine
101. X TO CAM. 1 SLIDE 87 laws which keep order in the world./
- However, when people obey his laws and work for a better life, Zeus gives
102. X TO T/C ANIMATED FILM them sunshine and fertile rain./
- Moreover Zeus sends to people, joy and sorrow. Up on Mount Olympus there are two big jars. The first contains all the pleasures of the world. In the second there are all the troubles of the world. From these jars Zeus takes joy and sorrow and sends it to people on earth. The person who gets only

VIDEO

AUDIO

SHOT

sorrow is destined to have a bad life.

There is nothing he can do about it.

This is the will of the King of gods.

The Fates, the three daughters of Zeus,

also control the lives of men. Zeus

never intervenes in their decisions.

Clotho is the Spinner. She spins the

thread of the life of every person.

When she decides to give an end to the

life of a man she cuts the thread.

Lachesis chooses the lot of every man.

Atropos writes down what her sisters

have decided. All of which she writes

down cannot be changed or avoided and

becomes man's destiny. These are the

Fates, strict, unbending and unavoi-

able. Besides the fates, Zeus has



VIDEO

AUDIO

SHOT

another daughter, Fortune. She travels about heaping gifts from the horn of plenty. Her eyes are closed, so she does not know who is getting her awards.

This is a matter of chance. The man who meets Fortune is very lucky. He gets many gifts in life. However, very few people are lucky for it is a very rare thing for a man/ to meet

103. X TO T/C SLIDE 88

Fortune. All these gods and many others, rule the life of people on earth and keep order and peace all

104. X TO CAM. 3 BOOK

over the world./ This is the myth of Cosmogogenesis. Although myths sound like untrue stories, we find in them the very life of the old people; the way they saw and

VIDEO

AUDIO

SHOT

105. . . . PAGES KEEP TURNING interpreted the world around them.  
WITH CREDITS

APPENDIX B

QUESTIONNAIRE FOR INFORMATION ACQUISITION MEASURE

Dear Student:

We would like to ask you a few questions about the program you have just watched. This is not a test. We simply want to know how much you have learned from this program.

Do not write your name on any page in the questionnaire.

Please --

Read all questions carefully.

Answer all questions.

Make sure that all answers are marked clearly.

THANK YOU FOR YOUR COOPERATION.

Check which of the statements given below is correct by placing a circle around the appropriate letter.

example: The 1976 Olympic games took place in

- a. Toronto
- b. Vancouver
- ☒ c. Montreal

1. Myths were created by man because

- a. he had a rich imagination
- b. he wanted to explain the changes happening around him
- c. he wanted to dominate Nature
- d. none of the above.

2. The Greeks called the myth of the creation of the world

- a. Astrogenesis
- b. Cosmogonia
- c. Cosmology
- d. Cosmogogenesis.

3. Before the creation of the world the only god who existed was

- a. Zeus
- b. Chaos
- c. Thor
- d. Jupiter

4. During the day the goddess Night stays
  - a. in the underworld
  - b. inside the earth
  - c. in Tartarus a place in the underworld
  - d. all of the above.
5. Heaven was the son of
  - a. Mother Earth
  - b. Chaos
  - c. Nature
  - d. Ouranus.
6. The Cyclopes
  - a. had two eyes like all men
  - b. had one big eye
  - c. were tiny little creatures with one eye
  - d. were terrible giants with one eye.
7. The early greek storytellers believed that in the beginning of all things god Chaos created
  - a. Love
  - b. the Black-winged Night
  - c. the Earth
  - d. Heaven

8. The Cyclopes were the children of
  - a. Chaos and Night
  - b. Chaos and Mother Earth
  - c. Mother Earth and Heaven
  - d. None of the above.
  
9. The Hundred-handed ones had the strength of
  - a. Volcano
  - b. Earthquake
  - c. Storm
  - d. None of the above.
  
10. Cronus was a
  - a. Cyclope
  - b. Hundred-handed one
  - c. Titan
  - d. Man
  
11. Which of his children was Heaven attacked by
  - a. Beasts
  - b. Cyclopes
  - c. Cyclopes and the Hundred-handed
  - d. Titans



12. Zeus was the son of
- a. Cronus and Rhea
  - b. Cronus and Mother Earth
  - c. Heaven and Mother Earth
  - d. None of the above.
13. Cronus knew that one of his children was destined to dethrone him.  
This child was
- a. Hermes
  - b. Zeus
  - c. Titan
  - d. Heavenly
14. Cronus wounded his father with a
- a. Spear
  - b. Flint-sickle
  - c. Rifle
  - d. Stone.
15. The Cyclopes and the Hundred-handed ones were kept in Tartarus by
- a. Cronus
  - b. Heaven
  - c. Metis
  - d. None of the above.

16. The three daughters of Zeus who control the life of men are

- a. The Furies
- b. The Fates
- c. The Sirens
- d. The Muses.

17. Fortune carries the

- a. horn of misery
- b. horn of happiness
- c. horn of abundance
- d. horn of plenty.

18. The Hundred-handed ones were so strong that they could

- a. lift up the mountains
- b. scoop out the seas
- c. make the earthquake
- d. both a and c.

19. The Cyclopes

- a. had one big eye
- b. were masters of the fire
- c. caused lightning and thunder
- d. all of the above.

20. The person who gets only sorrows
- a. is able to avoid his bad destiny
  - b. is unable to change his destiny
  - c. is very unhappy
  - d. none of the above.
21. Man was the son of
- a. Mother Earth
  - b. Nature
  - c. Mother Earth and Heaven
  - d. Sea.
22. Cronus decided to swallow his children because
- a. he was afraid of losing his throne
  - b. he hated them
  - c. he wanted to punish his wife Rhea
  - d. he was mad.
23. Zeus' friends were
- a. the animals of the forest
  - b. the wise eagle
  - c. the Nymphs of the mountains
  - d. all of the above.

24. The sky is covered by clouds and thunder when

- a. Zeus is sick
- b. Zeus is angry
- c. Zeus wanders around the mountains
- d. Zeus wants to remind people that they don't obey his laws.

25. Zeus was told about his father by

- a. the Nymphs
- b. the animals of the forest
- c. the wise eagle
- d. his mother Rhea.

26. Cronus' action against his father became the cause of

- a. the birth of Furies
- b. all the evil in the world
- c. quarrel, fear and anger.
- d. none of the above.

27. Joy and sorrow are sent to people by

- a. Cronus
- b. Heaven
- c. Zeus
- d. Fates

28. Zeus mixed with Cronus' drink

- a. honey
- b. a special drink given by Metis
- c. a special powder
- d. red wine.

29. Check the correct statement:

- a. Zeus is the son of Cronus
- b. Cronus is the son of Heaven
- c. Heaven is the son of Earth
- d. all of the above.

30. The palace of Gods is up on

- a. The mount Parnassos
- b. The Alps
- c. The Mount Olympus
- d. None of the above.

31. The goddess Fortune

- a. decides to whom she will give her awards
- b. does not know who is getting her awards
- c. has her eyes closed
- d. both b and c.

32. In the war against the Titans, Zeus was helped by
- a. his brothers and sisters
  - b. the Cyclopes and the goddess of Victory
  - c. the Cyclopes and the Hundred-handed ones
  - d. his brothers, the Cyclopes and the Hundred-handed ones.
33. Zeus decided to make the laws
- a. in order to protect people
  - b. in order to punish people
  - c. in order to control people's life
  - d. none of the above.
34. Check the correct statement:
- a. Very few people are lucky.
  - b. It is a very common thing for a man to meet Fortune
  - c. It is a very rare thing for a man to meet Fortune
  - d. Both a and c.
35. The Fates
- a. spin the thread of life
  - b. choose the lot of each man's destiny
  - c. write down man's destiny
  - d. cannot be turned or avoided.

QUESTIONNAIRE FOR ATTITUDE TEST

Please show how you felt about the TV program by marking an X in one of the spaces following each statement.

Example:

The TV program was enjoyable.

If you agree with the above statement you will mark an X in space Agree (A).

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
SD	D	U	A	SA



1. The program was great. 

SD	D	U	A	SA
----	---	---	---	----
2. I did not consider the program interesting. 

SD	D	U	A	SA
----	---	---	---	----
3. I felt "wrapped up" in the program. 

SD	D	U	A	SA
----	---	---	---	----
4. The program was not worth watching. 

SD	D	U	A	SA
----	---	---	---	----
5. I thought the program was excellent. 

SD	D	U	A	SA
----	---	---	---	----
6. My attention wandered during the program. 

SD	D	U	A	SA
----	---	---	---	----
7. I was absorbed in watching the program. 

SD	D	U	A	SA
----	---	---	---	----
8. I did not like the program. 

SD	D	U	A	SA
----	---	---	---	----
9. I thought the program was fantastic. 

SD	D	U	A	SA
----	---	---	---	----
10. The program did not make me feel involved. 

SD	D	U	A	SA
----	---	---	---	----
11. The program was a pleasure to watch. 

SD	D	U	A	SA
----	---	---	---	----
12. I did not enjoy watching the program. 

SD	D	U	A	SA
----	---	---	---	----
13. I thought the program was interesting. 

SD	D	U	A	SA
----	---	---	---	----
14. I lost interest during the program. 

SD	D	U	A	SA
----	---	---	---	----

APPENDIX C

ITEM ANALYSIS OF THE INFORMATION ACQUISITION QUESTIONNAIRE

The techniques used for item analysis are those described in Tuckman (1972, p. 155).

Difficulty and discriminability indices of Table 1 are based on division of upper 1/3 and lower 1/3 scorers.

The index of difficulty can be defined as the extent to which test items can be responded to correctly by any student.

The index of discriminability refers to the extent to which a test item is responded to correctly by those students possessing more of this quality.

Satisfactory index of difficulty is that above .33 not exceeding .67.

Satisfactory index of discriminability is that above .67. Items 9, 13, 25, 27, 28, were discarded since they did not meet one or both criteria of acceptance.

Items 3, 6, 11, 15, 18, 35 were retained since they had a very close to satisfactory index of difficulty.

TABLE I  
ITEM ANALYSIS OF INFORMATION ACQUISITION QUESTIONNAIRE

ITEM	Upper 1/3	Lower 1/3	ANALYSIS Difficulty Index	Discriminability Index
1	3	3	0.70	0.58
2	8	2	0.50	0.80
3	10	4	0.30	0.71
4	6	1	0.65	0.85
5	10	3	0.35	0.77
6	10	4	0.30	0.71
7	8	2	0.50	0.80
8	7	3	0.50	0.70
9	0	8	0.60	0.00
10	5	2	0.65	0.71
11	9	1	0.70	0.83
12	7	2	0.55	0.78*
13	10	8	0.10	0.55
14	8	4	0.40	0.67
15	5	1	0.70	0.83
16	6	7	0.65	0.85
17	10	0	0.50	1.00
18	4	2	0.70	0.67
19	7	0	0.35	1.00
20	9	1	0.50	0.90
21	8	4	0.40	0.67
22	10	4	0.30	0.71
23	9	2	0.45	0.82
24	7	3	0.50	0.70
25	9	7	0.20	0.56
26	5	2	0.65	0.71
27	1	9	0.50	0.10
28	9	6	0.25	0.60
29	6	0	0.70	1.00
30	8	2	0.50	0.80
31	9	3	0.40	0.75
32	8	2	0.50	0.80
33	8	4	0.40	0.67
34	6	3	0.55	0.67
35	4	2	0.70	0.67

RELIABILITY TEST OF THE INFORMATION ACQUISITION QUESTION-  
NAIRE BASED ON THE SCORES OF THE TREATMENT I (ANIM-  
ATION) GROUP ON THE 29 ITEM FINAL QUESTIONNAIRE

The simplest means of estimating the reliability of test scores from a single administration of a test is by using the Kuder-Richardson formula.

$$(KR_{21}) = 1 - \frac{M(K - M)}{(K)(S)^2}$$

where

K = number of items in the test = 29

M = mean of the test scores = 14.40

S = standard deviation of the test scores = 6.66

$$(KR_{21}) = 1 - \frac{14.40(29 - 14.40)}{(29)(6.66)^2} = 0.83$$

SPLIT-HALF RELIABILITY TEST OF THE LIKERT SCALE ATTITUDE  
TEST BASED ON THE SCORES OF THE GROUP EXPOSED TO  
TREATMENT I (ANIMATION)



The Spearman-Brown formula was used to calculate the attitude test reliability.

$$r_{kk} = \frac{n \cdot r}{1 + (n-1)r}$$

where

$r$  = the correlation coefficient between the two sets of scores (odd and even items).

$n$  = number of sets.

The correlation coefficient between the two sets of scores was calculated according to the method described in Gronlund (1968) which gives a crude estimate of the correlation obtained with the product-moment method. The value of  $r$  is based on the data of Table II (see pg. 92). The specific steps followed for the calculation of the correlation coefficient between the two sets are as follows:

- The number of students who were in the top half of the group on each set of cores was found.

TOP HALF SCORERS							
Set of Odd Numbered Items				Set of Even Numbered Items			
Boys	Scores	Girls	Scores	Boys	Scores	Girls	Scores
3	35	2	33	1	35	1	35
1	34	1	31	2	34	2	34
8	31	8	31	3	32	8	34
5	30	11	31	8	32	3	33
6	30	13	31	15	32	6	33
11	30	12	30	14	31	14	33
		14	30			11	32
		5	29			15	32
		15	29			5	31

The number of students who were in the top half of the group on both sets of scores being correlated was counted.

Top Half Scorers on Both Sets

<u>Boys</u>	<u>Girls</u>
1	1
3	2
8	5
	8
	11
	14
	15

N = 10

- This count was converted into a percent by dividing it by the total number of students in the whole group:

$$\frac{10}{30} \times 100 = 33.3\%$$

- The coefficient corresponding to this percent was found. (Gronlund, 1968; p. 98).

For 33.3%,  $r = 0.51$

For  $r = 0.51$  and  $n = 2$

$$r_{kk} = \frac{n \cdot r}{1 + (n-1)r} = \frac{2 \times 0.51}{1 + 0.51} = 0.675 \approx 0.68$$

For classroom tests the value of the reliability coefficient ranges between .60 - .80. The reliability coefficient for the attitude test is .68 which is within the acceptable range.

TABLE II

INDIVIDUAL SCORES BASED ON THE ODD AND EVEN NUMBERED ITEMS OBTAINED FROM THE ATTITUDE MEASURE

Set of Odd Numbered Items				Set of Even Numbered Items			
Boys	Scores	Girls	Scores	Boys	Scores	Girls	Scores
1	34	1	31	1	35	1	35
2	27	2	33	2	34	2	34
3	35	3	28	3	32	3	33
4	21	4	24	4	28	4	30
5	30	5	29	5	25	5	31
6	30	6	26	6	30	6	33
7	27	7	24	7	30	7	25
8	32	8	31	8	32	8	34
9	27	9	28	9	29	9	29
10	27	10	26	10	29	10	28
11	30	11	31	11	27	11	32
12	27	12	30	12	29	12	30
13	26	13	31	13	30	13	30
14	23	14	30	14	31	14	33
15	24	15	29	15	32	15	32

APPENDIX D

TABLE 1  
INDIVIDUAL SCORES OBTAINED FROM THE 29 ITEM INFORMATION ACQUISITION

Boys	Control	Animation	Dramatic Representation	Girls	Control	Animation	Dramatic Representation
1	19	34	22	1	18	14	29
2	9	5	20	2	7	6	16
3	9	17	19	3	8	21	16
4	8	22	17	4	9	13	15
5	7	22	16	5	11	6	15
6	8	8	16	6	11	19	15
7	1	5	18	7	9	17	12
8	8	7	14	8	2	6	11
9	12	13	14	9	6	9	9
10	10	21	12	10	8	24	10
11	15	17	10	11	10	17	9
12	7	21	6	12	14	21	11
13	10	21	5	13	5	23	6
14	11	14	5	14	8	5	16
15	8	7	14	15	9	17	9
Σ	142	214	208	Σ	135	218	194

TABLE 2.

INDIVIDUAL SCORES OBTAINED FROM THE 17 ITEM (TREATMENT UNITS) INFORMATION ACQUISITION

Boys	Control	Animation	Dramatic Representation	Girls	Control	Animation	Dramatic Representation
1	11	6	12	1	11	6	13
2	6	4	11	2	3	4	8
3	5	12	10	3	4	11	9
4	6	13	8	4	6	4	8
5	6	14	8	5	6	4	6
6	4	2	8	6	6	12	8
7	1	2	8	7	4	11	8
8	4	3	10	8	0	4	5
9	8	6	8	9	3	7	5
10	6	11	6	10	3	13	6
11	7	12	6	11	4	10	5
12	5	11	3	12	9	10	8
13	10	13	2	13	4	14	2
14	6	7	2	14	4	3	7
15	4	4	10	15	4	11	5
$\Sigma$	89	120	112	$\Sigma$	71	124	103

Questions: 4, 5, 6, 7, 8, 10, 11, 14, 16, 17, 18, 19, 20, 21, 31, 34, 35.

TABLE 3  
INDIVIDUAL SCORES OBTAINED FROM THE ATTITUDE MEASURE TOWARDS THE TV PROGRAM

Boys	Animation	Dramatic Representation	Girls	Animation	Dramatic Representation
1	69	41	1	66	56
2	61	49	2	67	49
3	67	48	3	61	53
4	49	60	4	54	56
5	55	70	5	60	54
6	60	59	6	59	44
7	57	60	7	49	56
8	64	55	8	65	46
9	56	54	9	57	56
10	56	50	10	54	32
11	57	45	11	63	54
12	56	51	12	60	44
13	56	34	13	61	42
14	54	57	14	63	46
15	56	47	15	61	39
$\Sigma$	873	780	$\Sigma$	900	727

APPENDIX F



MULTIPLE COMPARISON TEST

TUKEY METHOD

The Tukey method as described in (Glass and Stanley, 1970, p. 443) was employed to determine which of the pairs of sample means show differences large enough to permit the conclusion that the underlying population means differ.

The construction of a set of simultaneous confidence intervals around the difference between pairs of means is given by:

$$(\bar{X}_i \dots \bar{X}_{j*}) \pm 1 - \alpha^{qI, N-IJ} \sqrt{\frac{MS_w}{N/I}}$$

where

$\bar{X}_i \dots \bar{X}_{j*}$  - means of the groups compared.

$1 - \alpha^{qI, N-IJ}$  -  $100(1 - \alpha)$  percentile point in the studentized range distribution with  $I$  and  $N - IJ$  degrees of freedom (see Table F in Glass and Stanley).

$\alpha$  - level of confidence.

$1 - \alpha$  - confidence coefficient.

$MS_w$  - mean square within cells from the two way analysis of variance.

$I$  - number of experimental treatments.

$J$  - levels of the moderator variable.

$N$  - common number of observations on which each of the  $I$  sample means is based.

The value of confidence interval required for a significant difference between  $\bar{X}_i$  and  $\bar{X}_{j*}$  is any value greater than zero.