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THE EFFECT OF SHORT-TERM INTERRUPTIONS UPON FACTUAL ACQUISITION FROM MOTION PICTURE FILMS AMONG INTERMEDIATE ELEMENTARY SCHOOL PUPILS

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CHAPTER I

INTRODUCTION TO THE PROBLEM

Background Information

Although controversy surrounds virtually every phase of man's education, it has long been agreed that man can and does "learn," that some "learn" more readily than others, and that almost anyone can "learn" better under some circumstances than others. Educators, education philosophers and education psychologists continue to debate the "hows" and "whys" of man's learning as they have done for centuries, finding much to disagree about and all too little to hold in common. Among the few notions which are almost unanimously agreed upon is the necessity for sense perception in the first place, and the importance of retention and recall of sensory data for rational purposes at a later time. It was recognized immediately after the invention of motion picture photography that films could be a highly significant source of visual stimuli for learning; and when sound, color, animation, and

other special techniques were developed, the motion picture film became an unparalleled tool for education. Thus, innumerable studies have been made on the perceptual problem aimed at increasing our understanding of visual and auditory experiences and, perhaps more importantly, how significance and meaning are attached to such experiences. A necessary concomitant of such studies was, and is, how these experiences are "stored" in the brain's "memory-bank" until the need for recall, the length of such "storage" under various conditions, and the circumstances under which recall has the highest probability of success. Thus the classic studies of Ebbinghaus in 1885 gave us the "retention curve." But his studies were primarily concerned with long term retention of single individuals after the learning process had been completed i.e. how much of what had been learned could be recalled hours, days, weeks, and months afterward. In 1959 Peterson and Peterson studied short term recall of verbal items by single individuals--dealing in seconds, but again after the learning was completed. Postman and Riley's studies indicate that interpolated activities (activities intended to prevent rehearsal between the time of learning and the request to recall) may actually interfere with successful recall. No studies have been found, however, to discover the effect of a short time interval upon individual learning in a group situation when the interval occurs as an interruption <u>during</u> the learning process rather

than afterward. And this is precisely the type of problem which most frequently occurs in the public schools, according to Phillip Jackson in Life in Classrooms. The causes for such interruptions are many, ranging from malfunctioning projection equipment, announcements over the public address system, to fire drills, to behavior problems or witticisms from the students, ad infinitum. Most are brief and may often be ignored by the teacher. But do these interruptions hinder factual acquisition and/or the ability to recall data once acquired? If so, some procedural changes by administrators and classroom teachers can be effected to eliminate some kinds of interruptions and perhaps minimize the negative effects of unavoidable ones.

STATEMENT OF THE PROBLEM

The problem of this study was: Do interrupting short time intervals affect factual acquisition from sound motion picture films among selected groups of intermediate level elementary school pupils to a significant extent?

PURPOSES OF THE STUDY

More explicitly this study was designed to:

1. Determine whether intermediate grade school students' factual acquisition was hindered significantly as a result of a short term interruption.
2. Determine what relationship existed between the intelligence of the student and the effects of interruption on factual acquisition.

3. Determine what relationship existed between the sex of the student and the effects of interruption on factual acquisition.

4. Determine what relationship existed between the grade level of the student and the effects of interruption on factual acquisition.

5. Determine what relationship existed between the socio-economic level of the student's family and the effects of interruption on factual acquisition.

HYPOTHESES

The following null hypotheses were derived in order to provide statistical testing so that the purposes could be fulfilled.

Ho_1 There is no significant difference between the scores obtained on tests covering interrupted films and uninterrupted films.

Ho_2 There is no significat difference between the scores obtained by higher intelligence students and lower intelligence students on tests covering interrupted and uninterrupted films.

Ho_3 There is no significant difference in the scores obtained by males and females on tests covering interrupted and uninterrupted films.

Ho_4 There is no significant difference in the scores obtained by fourth and sixth grade students on tests covering interrupted and uninterrupted films.

Ho_5 There is no significant difference in the scores obtained by students from high socio-economic families and those from lower socio-economic families on tests covering interrupted and uninterrupted films.

DEFINITION OF TERMS

1. Since most of the interruptions of the type mentioned previously as being most common in schools were under three minutes in length, short term intervals were no more than three minutes in length.
2. Intermediate grades included fourth and sixth grade levels.
3. Factual acquisition means the retention of specific information given as factual, and the ability to recall that information essentially as given within one hour after exposure to the information.
4. Higher intelligence students were those who had scored 105 or higher on the Stanford-Benet scale. Lower intelligence students were those who had scored 94 or below on the same scale.
5. Higher socio-economic level students were those assigned a value of seven or more using the following paradigm:

Family Income (in thousands)

Over 12	9-12	6-9	4-6	Below 4
5	4	3	2	1

Occupation

Professional	Semi Professional	Skilled	Semi Skilled	Unskilled
5	4	3	2	1

Lower socio-economic level students were those assigned a value of five or less on the paradigm.

MAJOR ASSUMPTIONS

1. It was assumed that all personal data given by the students was complete and accurate, that the instrumentation for determining intelligence was valid, and that the procedure for determining the socio-economic level of families was valid.
2. It was assumed that all students performed at their highest possible levels on the recall examinations.
3. It was assumed that the familiarity or unfamiliarity of facts presented in the selected films was randomly distributed.
4. It was assumed that there would be no significant differences in individual classroom teacher variables.

LIMITATIONS

1. Conclusions are limited to those students who participated in the study or who bear striking similarities to them in all variables.
2. Conclusions are concerned only with the retention of factual information i.e. recall, not interactions, processes, or motor skills.

3. Conclusions are limited to the factors of grade level, sex, scholastic aptitude, and socio-economic status.

DESCRIPTION OF SUBJECTS

The students who were the subjects of this study attended two elementary schools in the northwest section of Durant, Oklahoma, a small town of about eleven thousand citizens. This community still is largely rurally oriented, although some light industry has come in within the last decade. However, Southeastern State College, also in the northwest section of town, is the city's largest "industry" and virtually all of the families of faculty and staff members live in the northwest section of town. The children, therefore, who attend these schools, as a group, are from more affluent families than the schools in other sections of town; however, there are many children from lower socio-economic families in attendance also.

Caucasian and Indian children have always been fully integrated in these schools, but the only Negro students are the children of Negro parents who attend the college. There are very few, and none were enrolled in the schools used in this study.

The entire area of southeastern Oklahoma has rather accurately been described as very conservative politically, economically, educationally, and religiously, and it is

expected that these students generally would reflect this conservatism.

The school buildings themselves are modern, one being less than two years old. They are reasonably well furnished with equipment and materials for instruction, in some instances having above average media potential, such as television receivers in every room so that instructional programs originating from studios in the junior high school building may be utilized, projection screens in most rooms and available for others, and reasonable light control in all rooms used.

One school has an average daily attendance of five hundred twenty students in kindergarten through sixth grade with three sections of each grade except for kindergarten. There are twenty Caucasian and/or part Indian teachers, seventeen of whom have masters degrees and the other three working toward theirs. The other school has an average daily attendance of two hundred thirty-six in kindergarten through sixth grade with two sections of first, second, and third grades and one of the remaining grades. Ten Caucasian and/or part Indian teachers are employed, seven having their Master's Degrees and the other three near completion of theirs.

Of the teachers whose classes are involved in the study, all are over forty years of age, all have more than ten years total experience and at least three years of experience in their school and grade. All fourth grade

teachers were women; all sixth grade teachers were men. Thus it can be reasonably assumed that there were no significant differences due to individual teachers, as stated under major assumptions.

PROCEDURE FOR GATHERING DATA

Two fourth grade classes totaling approximately sixty students were designated "Control Group 4." Two sixth grade classes of like size were designated "Control Group 6."

Two other fourth grade classes of approximately the same size were designated "Experimental Group 4," and two other sixth grade classes of virtually the same size were designated "Experimental Group 6."

Three motion picture films on natural science which were designed for the intermediate grades were shown to both control groups without interruption. Immediately thereafter, they were given a test requiring recall of the information seen and/or heard on the film. Raw scores were developed and individual means computed. These same films were shown to both experimental groups, but during the showing, the equipment was manipulated so that the film was interrupted for a maximum of three minutes. Then, the tests were given and the means computed.

Personal data obtained from school records, data from questionnaires, individual scores, and group means were key punched into IBM cards for data manipulation by computer.

TREATMENT OF THE DATA

Since the subjects had to be treated by already-set groupings, the analysis of covariance statistic was used to test for the significance of differences between means for all hypotheses except Ho_2 where straight analysis of variance was used. Acceptable level of significance for refecting the null hypotheses was the .05 level of significance.

SIGNIFICANCE OF THE STUDY

Obviously factual acquisition--retention and simple recall--are not as highly complex as some other areas of learning, but without these fundamental building blocks, the more intellectually sophisticated areas of discovering meaningfulness and significance, discerning processes and interrelateness could not be developed. Thus a deeper understanding of those factors which help or hinder this basic form of learning is important for all other forms built upon it. Since it was discovered that short time interruptions, so common in schools, is a factor which negatively affects factual acquisition, some changes in classroom practices for both teachers and students are implied, some changes in administrative policies and practices need to be made in order to provide for a smoother, more uninterrupted flow of information to the students in order to maximize his factual acquisition so that the probability of his developing more complex learning skills optimally will be increased.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to ascertain whether short term interruptions affect the ability of intermediate level elementary school students to acquire factual information from motion picture films. Much research has been carried out, especially in the last two decades, dealing with the role of films in the teaching-learning process. No attempt has been made to present an exhaustive resume of this research, only those studies which seem most cogent for the problem at hand. Undoubtedly then, human judgment being the determinate of pertinency, the decisions to include or exclude a study is highly subjective and somewhat arbitrary. A sincere effort was made to include factors of significance which could aid other researchers, teachers or administrators in more fully understanding the specific problem under study and the broader implications which may be inherent in it.

First, let us note a body of research which clearly demonstrated that students can and do gain factual knowledge from films. As early as 1922, Yale University completed the first carefully controlled research on learning from films through its famous "Chronicles of America Photoplays"

experiment. Even though these films lacked sound, the results showed increased knowledge of persons, places, and events of American history of from 19 to 35 per cent over those students in the control groups. Furthermore, a stunningly significant increase in free reading of American history by those in the experimental group was noted.

Wood and Freeman in 1929 demonstrated similar results in the field of science as well as social studies in experiments jointly sponsored by the National Education Association and Eastman Kodak Company. In this study 60 per cent of the students who saw the films achieved a level of proficiency which only 50 per cent of the non-film viewing students reached. And, again, greater interest in voluntary reading among the film-using pupils was noted.

After sound films appeared in the '30s, investigations were carried out to discover whether they would be as successful as silent films. Roulon (1933) studied the use of sound films with ninth grade general science students and reports thusly:

> In terms of immediate student achievement, our results indicated that the teaching technique employing the motion picture film was 20.5 per cent more effective from the instructional standpoint than was the usual unaided presentation.[1]

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[1]Phillip J. Roulon, The Sound Motion Picture in Science Teaching, Harvard University Press, 1933, p. 98.

The same year Arnspiger measured the factual learning from sound films of nearly 2400 intermediate elementary school students in five eastern cities. He reports:

> The per cents of superiority ranged from 22 to 30 in the natural science units, and from 18 to 34 in the music units.[2]

Other studies in the same year by McClusky, Weber and Consitt showed similar results.

More recently Meierhenry and others in Nebraska found significant gains by high school students using sound films especially in the area of general science, biology, physics, and world geography.[3]

World War II brought urgency to the problems of instructing large numbers of people in the shortest possible time, and sound motion pictures played an important role in the solution to this problem. Only a few rigorously controlled experiments were carried out, but those which were indicated that sound films, properly used, produced more successfully trained personnel than other techniques, namely lecture with slides and lecture printed with illustrations in a handbook.[4]

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[2]Varney C. Arnspiger, Measuring the Effectiveness of Sound Pictures as Teaching Aids. Teachers' College, Columbia University, 1933, p. 83.

[3]Wesley C. Meierhenry, Enriching the Curriculum Through Motion Pictures. University of Nebraska Press, 1962.

[4]John R. Miles and Charles N. Spain, Audio-Visual Aids in the Armed Services. (Washington: American Council on Education, 1947), pp. 64-65.

Another study involved a comparison between students instructed by unsupplemented film and those instructed by a particularly competent instructor. The goal was not only factual acquisition, but practical application requiring both conceptual comprehension and motor skills. Results showed film-taught students required 7 per cent less time to reach proficiency than those taught by live instructor.[5]

Besides the capacity for disseminating information and teaching motor skills effectively, the armed services research indicated that films can significantly affect attitude formation. In the experiment described above, the learning psychologist discerned a definite tendency toward cooperative effort among the film-using groups not present among the non-film users.[6] Further, one experiment involved screening the film Battle of Britain for one group of troops, but not for a control group. Forty-three per cent of the control group believed that the Nazis would have conquered Britain if the British had not resisted so courageously and determinedly. Of the film-viewers, seventy per cent held this view which persisted strongly for at least nine weeks, the maximum time lapse for testing retention.[7]

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[5]Charles F. Hoban, Jr., Movies That Teach. (New York: Dryden Press, 1946), p. 11.

[6]Ibid., p. 17.

[7]Ibid., p. 62.

Roulon, Arnspiger, Knowlton and Tilton had all earlier observed the increase in retention of information as a result of film usage. Roulon noted a 38.57 per cent increase in junior high science,[8] Arnspiger noted a 9 to 18 per cent increase in 5th grade natural science and a 14 to 32 per cent increase in 7th grade music.[9] Knowlton and Tilton administered post tests as late as seven months after film viewing and showed 12 per cent more retention in historical geography.[10]

It has been previously noted that viewing films can result in increased interest manifested by voluntary independent study by the student. Some films are designed primarily as motivators, but most are not, though they may accomplish that goal. Hoban mentions a study by May and Jenkinson which demonstrated that significantly more students who saw a motivational film about a book actually obtained and read the book than those students who saw a longer information disseminating film about the same book.[11]

Wittich (1946) worked with the librarian of a large urban elementary school in devising a system of checking

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[8]Roulon, op. cit.

[9]Arnspiger, op. cit.

[10]Daniel Knowlton and J. Warren Tilton, Motion Pictures in History Teaching, (Yale University Press, 1929), p. 91.

[11]Hoban, op. cit., p. 15.

voluntary reading by over 300 intermediate grade pupils. The results showed that those who saw films regularly in class did more than 50 per cent more voluntary reading than those with whom no films were used.[12]

In 1952-53 Witty, Fitzwater and Gorman studied the usefulness of films in improving reading. Their study examined the influence of eight sound films on the reading ability of second grade students. They found that 95 per cent of the children improved their reading and vocabulary, 70 per cent expressed ideas more fully and more frequently during class discussion and 99 per cent wanted to continue work with films.[13]

John P. Kishler's experiment in 1966 indicated that the psychological principle of identification accounts for increased learning through films and the ease with which a student is able to "identify" with a character or situation in a film is highly correlated with his ability to learn from a vicarious experience.[14]

Genuine experiences are not always preferable to vicarious experiences for reaching many learning goals

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[12]Walter Arno Wittich, Effects of Film Use in Reading Habits, unpublished study. University of Wisconsin, 1946.

[13]Paul A. Witty and James P. Fitzwater. "An Experiment With Films, Film Readers, and the Magnetic Sound Tract Projector," Elementary English. April, 1953, pp. 231-232.

[14]Research in Instructional Television and Film. (Washington: U. S. Department of Health, Education and Welfare, 1967) pp. 109-110.

because of safety, expense, time-space considerations, replicability, and standardizing of experiences. Thus, films with their ease of identification principle may often be more desirable than a "real" experience. In 1961 Fulton and Rupiper[15] at the University of Oklahoma and Painter[16] at the University of Akron demonstrated that the far-more convenient technique of viewing films depicting classroom situations was just as effective as actual classroom observations for public school teacher trainees. Furthermore when significant differences were noted, they favored the film-viewing groups. Obviously, these advantages both explicit and implied, are not inherent in every film for every purpose. The content and structure of the film must be weighed in the light of the desired instructional purposes. However, the nature of the medium per se suggests some problems about structure which has prompted considerable research. For example: What should be the relationship between the audio channel and the visual channel? What specific photographic techniques are most effective for what purposes and with what kind of learners? These and other questions have been studied since the early thirties.

In England in 1930 a study was made to determine whether the learning from sound films was significantly better than that from silent, captioned films among nearly four

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[15] Ibid., p. 70.

[16] Ibid., pp. 143-144.

thousand students. The most astonishing result was the forty per cent increase in learning among the "backward" students with the sound films. It was concluded that poor reading ability, both in speed and comprehension accounted for the low achievement of these students with the silent films.[17]

Similarly in 1934, Leon Westfall's study reached the following conclusions:

> When the several forms of verbal accompaniment used on sound and silent films are classified into two groups, explanations given orally, and explanation written on film, certain differences become evident. Most important appears to be the superiority of oral methods with low ability students.

He continued:

> . . . forms of verbal accompaniment requiring reading did not cause high ability children to do better nearly so often as they cause low ability children to do poorer.[18]

Upon completion of his experiment, Westfall reached the following conclusions concerning the best forms of verbal accompaniment for films of the expository or science type:

1. A mechanically produced lecture was significantly superior to any other form of verbal accompaniment used in the experiment.

2. A lecture that is furnished with the film and read by the teacher was significantly superior to the same material printed on the film or to an explanation which the teacher prepared from material furnished with the film.

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[17]Leon Westfall, A Study of Verbal Accompaniment to Educational Motion Pictures. New York, Teachers College, Columbia University, 1934, pp. 4-5.

[18]Ibid., p. 5; 42.

3. An explanation which the teacher prepared from material furnished with the film was slightly but not significantly superior to long captions printed on the film.

4. Oral forms of verbal accompaniment were specifically helpful to low ability pupils.[19]

Frank N. Hartman has drawn a number of conclusions relevant to the integration of audio-visual elements into a multi-channel presentation. Some of these conclusions are:

1. A combination of audio-print seems better than either alone.

2. Pictoral-verbal presentations seem to be better than single channel ones although this is inconclusive.

3. Pictures may be superior to words as stimulus information in association learning.

4. If too many cues are provided in a multi-channel presentation, the probability of interference outweighs the advantages.

5. An attention-getting cue may compete with the real message.

6. The pictoral channel is often used as an attention-getting device while the audio is relied upon to convey the real message. Consequently it may override the verbal.

7. Pictoral messages are subject to misinterpretations as are verbal messages, therefore, the picture needs the word as often as the word needs the picture.

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[19]Ibid., p. 46.

8. When large amounts of print are projected before the audio beginning, the facilitation effect is lost because the reader is put ahead of the audio channel.

9. The audio channel is more capable of obtaining attention if it is used as an interjection on the pictoral rather than being continuously parallel.[20]

In an effort to determine the quality of the integration of the audio-visual elements in the films used in his study, Arnspiger applied these questions to each scene in the film.

1. Where sound other than speech was essential to a complete presentation of the concept, was it used?

2. Was the explanatory speech confined to a simple and concrete presentation or was it burdened with irrelevant or immaterial terminology.

3. Did any sound tend to distract attention from the pertinent and important elements of the scene because of disproportionate and unnatural amplification?

4. Were any distracting elements of either sight or sound occurring in the scene?

5. Did the speech or other sound tend to direct attention to the important elements of the scene?

According to these criteria each scene of the films was ranked on a three point scale, excellent, good and poor. By correlating these rankings with the test scores for the

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[20]Frank R. Hartman, "Single and Multiple Channel Communication," Audio-Visual Communication Review, Nov.-Dec., 1961.

items testing the material covered in each scene the author found that of the items in the highest quarter of the grades, sixty-three per cent were from scenes which were judged excellent, thirty per cent from those judged good and seven per cent from those judged poor. Thirteen per cent from the lowest quarter of the grades were from scenes judged excellent, nineteen per cent from those judged good and sixty-nine per cent from those judged poor. On the basis of these findings the author drew this conclusion, "It seems, therefore, from this analysis that the integration of audio-visual elements is of maximum importance in the production of educational sound films."[21]

From a similar analysis relating to the effectiveness of speech, other sound and picture as elements in instructional film, he reached this conclusion:

> The most effective presentation of concepts as measured by the test items of this experiment was made by the use either of speech and picture combined or of speech, other sound and picture combined. The least effective presentation seems to be the use of sound and picture combined (without accompanying speech) or picture alone . . . it appears that the proper integration of the audio-visual elements requires a judicious selection of one of the two most effective methods . . . depending upon the nature of the concepts to be presented.[22]

By comparing his conclusions with those of Hartman which were made more than twenty years after, we find that

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[21]Arnspiger, op. cit., p. 78.

[22]Ibid.

they contain some common things. One of these is the superiority of a multi-channel presentation over a single channel presentation and another is the importance of proper integration of these channels for the maximum facility of learning.

Morgan D. New's study concerned the effects of attention-gaining devices on film-mediated learning. He concluded that attention-gaining devices which did not add information to the content of a film did not increase learning.

Beryl Bruce Blain made a study of the relative effectiveness of expository and dramatic narrations and reached the conclusion that eighth grade students learned more from the expository narration than the dramatic.[24]

George Joseph Vuke conducted an experiment to determine whether questions inserted into a film would increase the learning from the film, but could find no difference between the learning of the experimental and control groups.[25] However, a similar study of the effect of subtitles inserted into a film, conducted by Dean S. Northrop indicated that these may be expected to increase the learning from a film if the film is not inherently organized. In cases where a

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[23]Research in Instructional Television and Film (Washington: U. S. Department of Health, Education and Welfare, 1967), pp. 140-141.

[24]Ibid., pp. 32-33.

[25]Ibid., p. 184.

film is highly organized the subtitles may interfere with the learning.[26]

The effectiveness of animation and certain photographic techniques in making some concepts more comprehensible was indicated by Arnspiger's study in which all eight films used caused a gain over the control group. However, the group which showed the highest difference was one which used the film, Growth of Plants. This film visualized such phenomena as the flowing movements of protoplasm, the growing movements of plant roots, stems and leaves, seed germination, osmosis and the actual contortions of the plant dying.[27] The influence of simple animation techniques on learning was isolated in a study conducted by A. A. Lumsdaine and others in which they ascertained that groups viewing the animated film learned significantly more than groups viewing the non-animated film, regardless of pretesting, number of examples or whether or not they saw the supplementary sound filmstrip.[28]

Two other photographic techniques which are undoubtedly of benefit in certain educational situations are slow motion and time-lapse photography. Slow motion photography is achieved by filming action with a higher camera speed than

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[26]Ibid., p. 142.

[27]Arnspiger, op. cit., p. 29.

[28]Research in ITV and Film, op. cit., p. 123.

the speed at which the film will be projected for viewing. This technique causes the action to appear much slower than it actually was and allows viewing and analysis of motion which is much too rapid for the human eye to comprehend. Time-lapse photography is the reverse of slow-motion and speeds up movement that in its natural state occurs too slowly for observation. I regret that I was unable to find research which isolated these factors and analysed their effectiveness. Arnspiger attempted to run an analysis on them for the eight films used in his study but reported that they did not occur often enough to furnish any valid evidence.[29] He did conclude that repetition of concepts within a film may be an important structural element.[30]

Other photographic techniques which may be beneficial when used in instructional films involve the "length" of the shot and the angle from which it is taken. Arnspiger found evidence the "close-up" was more effective than the "medium" or "long" shots in presenting concepts of the type involved in his study. However, he ruled these findings inconclusive because he did not compare different length shots of scenes presenting identical subject matter.[31] Miles and Spain report that in the armed service experiment concerned with

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[29]Arnspiger, op. cit., p. 71.

[30]Ibid., p. 75.

[31]Ibid., pp. 71-72.

position firing, the camera angle was considered an important advantage of the film as the film producers had made a conscious effort to increase student identification and participation by having the camera become the "eyes" of the student thus tending to make the student feel he is doing the firing rather than observing it demonstrated.[32] Hartman reports a study conducted by Roshal involved teaching knot tieing in which it was estimated that the camera view most nearly approximating that of the person tieing the knots was most effective.[33]

Using two hundred fifty seventh graders as Ss, Severin (1968) demonstrated the superiority of mutually supportive audio-visual stimuli for factual acquisition, over visual only, audio only, two-channel redundant, two channel high similarity and two channel-low similarity stimuli. Statistically significant also was the superiority of visual only over the audio only. These results are highly limited in that the factual acquisition was merely repetition of known nouns.[34]

Allen, Cooney, and Weintraub (1968) compared the effectiveness of five different modes of audio narration in

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[32]Miles and Spain, op. cit., pp. 64-65.

[33]Hartman, op. cit., p. 244.

[34]Severin, Werner, Cue Summation in Multi-Channel Communication. Report from the Media and Concept learning Project. Wisconsin Research and Development Center for Cognitive Learning. University of Wisconsin, 1968.

motion and still pictures among sixth graders. No significant differences were found except that students of lower scholastic ability appeared to be less able to learn from films which asked questions or presented narration in a non-linear way. Further, the different modes of audio presentations seemed to affect the amount of factual acquisition more than the comprehension of overall concepts or the application of knowledge. I suspect that this might be explained by the verbalization limitations characteristic of students at this grade level. Qualitative analysis employing the semantic differential did show that motion pictures were more positively received than still pictures.[35]

Of particular relevance for classroom teachers is the research that has been conducted concerning the effectiveness of various techniques and procedures involved in the utilization of films for instruction. Hoban reports one study in which the effects of supplementary activity were compared in an experiment by the army on a film used to teach map reading. It was found that following the film with an oral quiz was significantly better than the film alone and a brief introduction by the instructor in addition to the film produced results significantly better than those obtained by the film and oral quiz.[36] Another fact of

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[35]William H. Allen, Stuart M. Cooney and Royd Weintraub, Audio Implementation of Still and Motion Pictures. University of Southern California, 1968.

[36]Hoban, op. cit., pp. 1-13.

considerable importance was revealed by this study. The introductory remarks prior to a film's showing seemed to have a radiating effect so that not only were some of the more difficult points of the film explained and clarified in advance, but the audience was also stimulated and motivated to pay closer attention to the entire film.[37]

Tracy S. Kendler, et. al., made a study on the effects of overt audience response during a film showing. They concluded that this active participation increased learning significantly.[38] Phillip Ash and Nathan Jaspen studied overt participation as one of the variables in an experiment. They concluded that participation was helpful with the slow developing version of a film, but was detrimental with the fast version. However, the positive effects with the slow film were greater than the negative ones with the fast film.[39] Another factor tested in this experiment was the effect of repeated showings of the same film to the group. They found that significant gains were made for only the first two viewings and the third viewing for the fast film.[40] This indicates that repetition of a film may have some value, up to a point, and that this value may be in proportion to the difficulty of the film.

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[37] Ibid., p. 15.

[38] Research in ITV and Film, op. cit., p. 108.

[39] Ibid., pp. 27-28.

[40] Ibid.,

Phillip Ash and B. J. Carlson in another experiment concluded that note-taking during a film was significantly detrimental to learning. They concluded that this interference took place because the films did not have pauses and repetition necessary for note-taking.[41]

Some of the early research in instructional film gave indications that film might be more beneficial to slow learners than those of average or higher intelligence. Further research has failed to support this hypothesis and it seems likely that these early experimenters were overimpressed by results which compared the learning of slow students over filmed material with their learning over written material. Arnspiger determined that the films he used made a distinct contribution to the learning of both slow and rapid learners.[42] Research reported by Charles Hoban indicates that instructional film is not a "great equalizer" with regard to level of education attained, as was once hoped. Research showed that while a group of men with grade school education made very significant gains in learning from film viewing, those men with high school and college educations made even greater gains.[43]

Herman F. Brandt conducted a detailed study of ocular performances by making motion pictures of eye movements

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[41]Research in ITV and Film, op. cit., pp. 25-26.

[42]Arnspiger, op. cit., pp. 43-44.

[43]Hoban, op. cit., p. 7.

while subjects viewed media such as still pictures, print, and motion pictures. By analysing this film, he has established patterns of eye performance for viewing still media and motion pictures and identified some differences in these patterns.

He found that composition, continuity and implied action are not as important as determinents of occular performance in motion pictures as in still ones because the sound and action in the motion picture are highly directive. Due to shifting of the camera scenes, the sound and action in motion pictures, eye movement patterns established for still pictures such as preferred position (center of interest) and horizontal eye movements are absent when viewing motion pictures.[44]

He contends that it is easier to concentrate on a motion picture than printed material or pictures in books or magazines because of the conditions in which motion pictures are presented, a darkened room where distractions in the environment are reduced to a minimum. He feels that action may be a stronger determiner of attention than sound.[45]

He further concludes that viewing of motion pictures is more relaxing because reading or near-viewing requires

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[44]Godfrey M. Elliot, (ed.) Film and Education, New York: Philosophical Library, 1948.

[45]Ibid.

convergence of the eye and if viewers are seated far enough from the screen less eye movement is required.[46]

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[46] Ibid.

CHAPTER III

DESIGN AND METHODOLOGY OF THE STUDY

In order to determine whether short term interruptions significantly affect factual acquisition from motion picture films among intermediate level elementary school pupils, the following experiment was designed and conducted:

With the cooperation of the Durant, Oklahoma public school system, four fourth grade classes, totaling one hundred twenty students and four sixth grade classes totaling one hundred twenty-four students were selected to serve as subjects for the experiment. The classes were markedly similar in their distributions of students' ages, sex, socio-economic class, and scholastic aptitude. The students had been randomly assigned to their classes by the school principal.

The classroom teachers were very similar in degrees held, experience, age and sex, all fourth grade teachers were female and all sixth grade teachers male.

Three eight-minute nature study films, designed for intermediate classes were selected from the film library of Southeastern State College. They were "Butterflies," "Barn Swallow," and "Biography of a Fish" all produced by Coronet Films Incorporated. These films were all in black and white,

with parallel narration on optical sound track. In the butterfly film, a small amount of animation and printed word cues were used as well as a segment of time-lapse photography. Each film utilized some telephotography and the fish film had a short segment of microphotography. The factual content of each film was carefully studied and completion tests developed covering the factual presentation of each film. To validate these instruments a group of elementary education majors was shown each film and its accompanying test. Recommended rewording was followed and the revised instruments were used with a sample of seven fifth grade students who were enlisted to assist with the project. These students viewed the films and took the revised tests. The tests were scored and the results discussed. No incorrect responses were identified as being caused by unclear questions, and all students agreed the facts called for had indeed been presented by the film. Thus the instruments were deemed valid.

Two fourth grade and two sixth grade classes were selected as control groups and a like number designated experimental groups. Beginning with the fourth grade groups, the films were shown and the tests administered. All fourth grades (and two weeks later all sixth grades) saw the films and took the tests on the same day during a part of the day uninterrupted by recess or noon lunch thus preventing communication between the classes. All showings and testings were carried out in the regular classroom teachers' absence.

The independent variable in the study was the existance or non-existence of short-term interruptions during the film showings. During the showings of the films to the experimental groups, the experimenter manipulated the motion picture projector so as to cause three interruptions of approximately fifty seconds each. This manipulation consisted of causing a blurring of focus with a simultaneous lowering of the volume of sound appearing to the Ss to require stopping, checking and rethreading the machine, rewinding the film sufficiently to prevent loss of factual presentation. All interruptions were concluded within eight seconds of the designated three-minute period.

Care was taken to insure maximum effectiveness in the mechanics of film showing. Each room was equipped with sufficient light control, electrical outlets, and a good matte screen. Each student was seated, none closer than two screen widths, none farther than six, and were placed within the forty-five degree projection angle. The acoustics were adequate and the speakers placed at ear level behind the students.

The tests were administered immediately after the conclusion of the film showing. No time limit was set, but all students had finished within twelve minutes.

The order of classes viewing the films and taking the tests was rotated so that no class was always first, second, third, or last.

When all classes had been tested and tests scored, students who were absent for one or more tests were eliminated as Ss. Questionaires (see p. 72 Appendix) designed to obtain information concerning student socio-economic status were distributed with a seventy-six per cent return. However, several of the forms returned contained no responses for certain questions. Personal interviews with friends and acquaintances provided sufficient information to designate the socio-economic status of all but a few of the students according to the criteria established in Chapter I. The scores of these students were not used in the analysis concerning socio-economic status.

Recent scholastic aptitude tests (Otis-Lennon with the same mean and standard deviation as the Stanford-Benet) were available from school permanent records for all but approximately five per cent of the total. Several students were tested as a result of the experimenter's discovery that no I. Q. scores were available. Those students whose I. Q. scores remained unknown were designated as normal, and their test scores not used in the analyses concerning scholastic aptitude.

Then student identification number, grade level, experimental designation, sex, socio-economic code, scholastic aptitude scores, and the three dependent variable scores along with their mean score was punched into computer cards.

STATISTICAL PROCEDURE

These cards were then manipulated according to the variables concerned and the analysis of covariance used to test the significance of differences between means of the control and experimental groups for all hypotheses except Ho_2 dealing with intelligence as a concomitant variable. It was assumed that intelligence differences would account for significant differences *per se*, thus the effects of the I. Q. scores were neutralized by the analysis of covariance technique described.

For Ho_2 straight one-way analysis of variance was used. Essentially, both techniques measure the probable chance and error variance both within groups tested and between groups tested leaving the remaining variance presumably due to causative variables. Sums of the squares of deviation from the mean on the criterion variable are computed, mean squares developed and the ratio of the mean squares from "Between groups" variance to "Within groups" variance yields the *F* value. The hypotheses will or will not be rejected on the basis of the *F* value when compared to the *F* tables at the .05 level of confidence.

Analysis of covariance differs from straight analysis of variance in that it allows the researcher to neutralize a variable which he feels he knows will be influential when he is seeking information about other variables. In this

procedure independent F tests are developed for the variables and regression computed and adjustments made in the sum of squares according to the regression findings. Then the mean squares are computed and the F value derived.

Physical manipulations of the computer cards into the various sub-groups allowed for interaction investigations as well as the single variable testing.

CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

The purpose of this chapter is to determine whether a statistically significant difference existed in the mean scores of variously grouped intermediate-level elementary school students as a result of short term interruptions manipulated as the independent variable in the experiment. These criterion scores were derived from the mean scores of individual students comprising the groups over the three tests used.

It was assumed that intelligence would be an important variable affecting the outcome of the experimental treatment, thus its effect was statistically neutralized by the use of the analysis of covariance for all hypotheses tested expect Ho_2 dealing with intelligence--thus testing the assumption. Straight analysis of variance was used in this case to arrive at the F values. The following tables and remarks indicate the findings of this experiment:

For hypothesis I: There is no significant difference between the scores obtained on tests covering interrupted films and uninterrupted films. Table I shows the F value for the differences between total control and total experimental

groups to be 3.90. Since this is greater than the 3.84 value of significance at the .05 level, the hypothesis is rejected.

TABLE I

ANALYSIS OF COVARIANCE FOR TOTAL CONTROL GROUP AND TOTAL EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	20.728	20.728	3.90
Within Groups	213	1130.514	5.307	
Total	214	1151.242		

Examination of the two grade levels separately, however, yields no significance.

TABLE II

ANALYSIS OF COVARIANCE FOR FOURTH GRADE CONTROL GROUP AND FOURTH GRADE EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	2.850	2.850	0.53
Within Groups	103	553.717	5.373	
Total	104	556.567		

TABLE III

ANALYSIS OF COVARIANCE FOR SIXTH GRADE CONTROL GROUP AND SIXTH GRADE EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	2.352	2.352	0.83
Within Groups	107	301.499	2.817	
Total	108	303.851		

These insignificant F values at each grade level appear to indicate the source of significance not to be in the treatment alone, but in an interaction among variables.

To check for reliability of results, the split-halves technique was used. Tables IV and V show the results.

TABLE IV

SPLIT-HALF A - TOTAL CONTROL - TOTAL EXPERIMENTAL

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	19.617	19.617	4.43
Within Groups	105	465.409	4.432	
Total	106	485.026		

The required F value for significance with 105 degrees of freedom is 3.94. Thus F 4.43 is found to be significant and supports the reliability of the total results.

TABLE V

SPLIT-HALF B - TOTAL CONTROL - TOTAL EXPERIMENTAL

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	12.259	12.259	2.59
Within Groups	105	496.778	4.731	
Total	106	509.037		

Significance was not reached in this half by approximately the same amount as the surplus in the previously reported half lessening the reliability only slightly.

Hypothesis 2: There is no significant difference between the scores obtained by higher-intelligence students and lower-intelligence students on tests covering interrupted and non-interrupted films.

Table VI shows the F value for the difference between total higher-intelligence control students and total lower-intelligence experimental students to be 30.26. The required .05 level of significance value is only 3.98. The value is therefore highly significant.

TABLE VI

ANALYSIS OF VARIANCE FOR TOTAL HIGH INTELLIGENCE CONTROL GROUP AND TOTAL LOW INTELLIGENCE EXPERIMENTAL GROUP

Variance Source	df	Sum of Squares	Mean Square	F
Between Groups	1	151.451	151.451	30.26
Within Groups	70	350.273	5.003	
Total	71	501.724		

Table VII shows the F value for the mean differences between the total high intelligence control students and the total high intelligence experimental students to be .62. Inasmuch as the required value for significance is 253, this difference is not significant.

TABLE VII

ANALYSIS OF VARIANCE
TOTAL HIGH INTELLIGENCE CONTROL GROUP
TOTAL HIGH INTELLIGENCE EXPERIMENTAL GROUP

Variance Source	df	Sum of Squares	Mean Square	F
Between Groups	1	2.786	2.786	0.62
Within Groups	106	475.277	4.483	
Total	107	478.063		

Since the F value of the mean difference is highly significant when the low intelligence group is experimental, but not when the high intelligence group is experimental, the null hypothesis is rejected.

The two separate grade levels reveal similar results and serve as a split-halves check for reliability on the total data. Table VIII shows the F value for the mean difference between the fourth grade high intelligence control group and the fourth grade low intelligence experimental group to be 10.03. An F value of 4.23 is significant.

TABLE VIII

FOURTH GRADE

HIGH INTELLIGENCE CONTROL GROUP
LOW INTELLIGENCE EXPERIMENTAL GROUP

Variance Source	df	Sum of Squares	Mean Square	F
Between Groups	1	54.263	54.263	10.03
Within Groups	27	146.034	5.408	
Total	28	200.297		

Table IX shows the F value for the mean difference between the fourth grade high intelligence control students and the fourth grade high intelligence experimental students to be .007, far below the required 4.03 for significance.

TABLE IX

FOURTH GRADE

HIGH INTELLIGENCE CONTROL GROUP
HIGH INTELLIGENCE EXPERIMENTAL GROUP

Variance Source	df	Sum of Squares	Mean Square	F
Between Groups	1	0.032	0.032	.007
Within Groups	51	216.104	4.237	
Total	52	216.132		

Since the F value is highly significant when the low intelligence group is experimental, but not when the high intelligence group is, the hypothesis is rejected at the fourth grade level.

Table X shows the F value for the mean difference between the sixth grade high intelligence control students and the sixth grade low intelligence experimental students to be 40.05 significant far beyond the 4.08 required.

TABLE X

SIXTH GRADE

HIGH INTELLIGENCE CONTROL GROUP
LOW INTELLIGENCE EXPERIMENTAL GROUP

Variance Source	df	Sum of Squares	Mean Square	F
Between Groups	1	112.689	112.689	40.05
Within Groups	41	115.354	2.813	
Total	42	228.043		

Table XI shows the F value for the mean difference between sixth grade high intelligence control group and the high intelligence experimental group to be .05. Significance requires 252.

TABLE XI

SIXTH GRADE

HIGH INTELLIGENCE CONTROL GROUP
HIGH INTELLIGENCE EXPERIMENTAL GROUP

Variance Source	df	Sum of Squares	Mean Square	F
Between Groups	1	.122	.122	.05
Within Groups	53	121.506	2.292	
Total	54	121.628		

Since the F value is highly significant when the low-intelligence group is experimental, but not when the high-intelligence group is, the hypothesis is rejected at the sixth grade level also.

Hypothesis 3: These is no significant difference between the scores obtained by males and females on tests covering interrupted and uninterrupted films.

Table XII shows the F value for the difference between the scores of total male control students and total female experimental students to be 9.74. The required value for significance is 3.94.

TABLE XII

TOTAL CONTROL MALES -
TOTAL EXPERIMENTAL FEMALES

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	45.476	45.476	9.74
Within Groups	109	508.881	4.668	
Total	110	554.357		

Tables XIII and XIV show the split-halves test for reliability for this grouping.

TABLE XIII

SPLIT HALVES

TOTAL CONTROL MALES - TOTAL EXPERIMENTAL FEMALES

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	21.059	21.059	4.57
Within Groups	52	239.688	4.609	
Total	53	260.737		

TABLE XIV

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	24.795	24.795	5.21
Within Groups	54	256.772	4.755	
Total	55	281.567		

The required value for significance with 50 degrees of freedom is 4.03. Thus the original measure is accepted as reliable.

To determine whether this interaction of treatment and sex was significant with female control and male experimental students further data was analyzed as follows:

TABLE XV

TOTAL CONTROL FEMALES - TOTAL EXPERIMENTAL MALES

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	0.212	0.212	0.036
Within Groups	101	592.875	5.870	
Total	102	593.087		

The required F value for significance is 253. Split halves analysis confirms the no significance conclusion for

this grouping. Thus it can be seen that the extreme significance for females in the experimental group, but not in the control group, justifies the rejection of the null hypothesis.

Hypothesis 4: There is no significant difference between the scores obtained by fourth and sixth grade students on tests covering interrupted and uninterrupted films.

Table XVI shows the F value for the difference between fourth grade control and sixth grade experimental students to be 15.96. The required value for significance is 3.95.

Table XVII shows the F value for the difference between sixth grade control and fourth grade experimental students to be 60.38. The required value for significance is 3.94.

TABLE XVI

FOURTH GRADE CONTROL GROUP
SIXTH GRADE EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	81.344	81.344	15.96
Within Groups	93	474.045	5.097	
Total	94	555.389		

TABLE XVII

SIXTH GRADE CONTROL GROUP
FOURTH GRADE EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	195.145	195.145	60.38
Within Groups	117	378.096	3.231	
Total	118	573.241		

As expected, grade level (indicating greater maturation) was highly significant regardless of which level was experimental or control. The fact that the F value is approximately four times as great when less mature students are experimental as when older students are indicates that older students are less affected by the independent variable than the younger ones. Thus the hypothesis is rejected.

In investigating grade level, sex and treatment interactions, some interesting results emerged. When sixth grade control males were compared to fourth grade experimental females, highly significant F values were observed. Table XVIII shows this value to be 49.67 where only 4.00 is required for significance.

TABLE XVIII

SIXTH GRADE CONTROL MALES -
FOURTH GRADE EXPERIMENTAL FEMALES

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	154.424	154.424	49.67
Within Groups	59	183.427	3.108	
Total	60	337.851		

And when the same sixth grade male control group was compared with the fourth grade male control group, the F, although highly significant as expected due to maturity, was only one-third as high as the value obtained from the comparison of males with females thus confirming the reliability of the results previously described concerning significance affected by grade level, treatment and sex. Table XIX shows the male to male comparison's F value to be 17.99 where 4.00 is significant at the .05 level.

TABLE XIX

SIXTH GRADE CONTROL MALES -
FOURTH GRADE CONTROL MALES

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	68.009	68.009	17.99
Within Groups	58	219.264	3.780	
Total	59	287.273		

For further confirmation on the reliability of previous results and to more specifically locate the source of variance, an analysis was made of the data comparing the sixth grade female control group and the fourth grade female control group. Table XX shows the F value to be 7.96. As expected this was highly significantly due to the maturity differential. (.05 level requires 4.05). What is interesting to note is that the differences between the sexes attributable only to sex (see also Table XIX) indicates that there is much less maturity differential between the two levels of females than between the two levels of males which indicates the accuracy of the studies indicating earlier maturity for girls than for boys.

TABLE XX

SIXTH GRADE CONTROL FEMALE GROUP - FOURTH GRADE FEMALE CONTROL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	44.157	44.157	7.96
Within Groups	44	243.989	5.545	
Total	45	288.146		

Hypothesis 5: There is no significant difference between the scores obtained by students from higher socio-economic families and those from lower socio-economic families on tests covering interrupted and uninterrupted films.

Table XXI shows the F value for the difference between total low socio-economic control students and the high socio-economic experimental students to be 1.76. The required value for significance at .05 is 3.96.

TABLE XXI

TOTAL LOW SOCIO-ECONOMIC CONTROL GROUP -
TOTAL HIGH SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	10.199	10.199	1.76
Within Groups	82	474.397	5.785	
Total		484.596		

Ta[illegible]e for the difference between tot[illegible]ntrol students and total low socio-ec[illegible]nts to be 1.81. The required F v[illegible]3.98.

Sinc[illegible]ficant at the required level, the hyp[illegible]ed.

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TOTAL HIGH SOCIO-ECONOMIC CONTROL GROUP -
TOTAL LOW SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	7.712	7.712	1.81
Within Groups	72	306.926	4.262	
Total	73	314.638		

Table XXI shows the F value for the difference between total low socio-economic control students and the high socio-economic experimental students to be 1.76. The required value for significance at .05 is 3.96.

TABLE XXI

TOTAL LOW SOCIO-ECONOMIC CONTROL GROUP - TOTAL HIGH SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	10.199	10.199	1.76
Within Groups	82	474.397	5.785	
Total	83	484.596		

Table XXII shows the F value for the difference between total high socio-economic control students and total low socio-economic experimental students to be 1.81. The required F value for significance is 3.98.

Since neither value was significant at the required level, the hypothesis was not rejected.

TABLE XXII

TOTAL HIGH SOCIO-ECONOMIC CONTROL GROUP - TOTAL LOW SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	7.712	7.712	1.81
Within Groups	72	306.926	4.262	
Total	73	314.638		

However, in examining the interaction of method, grade level and socio-economic level, a significant difference was found at the sixth grade level. Table XXIII shows the F value for the difference between sixth grade high socio-economic control students and sixth grade low socio-economic experimental students to be 4.19. The significance value required is 4.07.

No significance was found when the socio-economic and method variables were reversed. Thus it appears that at the sixth grade level, the hypothesis could be rejected. This might be explained in terms of older students being more aware of their socio-economic status than younger students and being affected by it.

TABLE XXIII

SIXTH GRADE

HIGH SOCIO-ECONOMIC CONTROL GROUP -
LOW SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	14.142	14.142	4.19
Within Groups	42	141.677	3.373	
Total	43	155.819		

Split halves reliability check results are shown in Tables XXIV and XXV. Inspection reveals results confirmed in

one case but not in both, thereby lessening reliability somewhat.

TABLE XXIV

SPLIT HALF A
SIXTH GRADE

HIGH SOCIO-ECONOMIC CONTROL GROUP -
LOW SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	10.432	10.432	5.68
Within Groups	21	38.555	1.835	
Total	22	48.987		

An F value of 4.30 is required for significance with 1/21 degrees of freedom.

TABLE XXV

SPLIT HALF B
SIXTH GRADE

HIGH SOCIO-ECONOMIC CONTROL GROUP -
LOW SOCIO-ECONOMIC EXPERIMENTAL GROUP

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	2.479	2.479	1.55
Within Groups	18	28.825	1.601	
Total	19	31.304		

An F value of 4.40 is required for significance with 1/18 degrees of freedom.

An interaction analysis was made contrasting sixth grade high socio-economic control males with sixth grade low socio-economic experimental females. Table XXVI shows an F value of 5.81. Significance requires 4.32. This result tends to confirm previous results showing both sex and socio-economic level to be significant variables.

TABLE XXVI

HIGH SOCIO-ECONOMIC CONTROL MALES -
LOW SOCIO-ECONOMIC EXPERIMENTAL FEMALES

Variance Source	df	Adjusted Sum of Squares	Mean Square	F
Between Groups	1	21.303	21.303	5.81
Within Groups	21	77.033	3.668	
Total	22	98.336		

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The chief purpose of this study was to determine whether short-term interruptions in viewing motion picture films would produce any positive or negative effects upon the factual acquisition of intermediate level elementary school students. It was noted in chapter I that sound motion picture films were recognized as important sources for both visual and auditory stimuli for the acquisition of basic facts. Chapter II presented the major findings of film research in support of this idea. It was further noted in chapter I that interruptions, usually short term, are a common occurrence in classrooms but little was known concerning the effect of these interruptions on the learning process which begins typically with the acquisition of pertinent facts. It was noted that studies involving a time interval between completion of certain types of learning tasks and tests demonstrating the retention of the learning typically show reduced learning correlating to the length of the time interval. (Peterson and Peterson, Portman and Riley, Ebbinghaus) It was therefore hypothesized that time

intervals which interrupted the factual dissemination would similarly cause reduced retention of those facts. To test this hypothesis and four others concerned with concomitant variables this study was designed and conducted.

One hundred eight fourth grade students and the same number of sixth grade students were shown three one-reel nature study films within their own familiar classrooms. Two of these class groups at each level were control groups whose film viewings were uninterrupted. The other two at both levels were experimental groups, whose viewings were interrupted during the showing for a total of three minutes per film. Validated tests over factual data presented in the films were administered to the S's immediately following the film showings. The tests were scored and the three scores averaged for the individuals, then for the groups.

The pertinent data was punched into IBM computer cards and computerized programs used to statistically analyse the data. Analysis of variance was used to test the significance of difference between group means for Ho_2 and analysis of covariance was used for the other hypotheses holding the intelligence score as the covariant to the criterion variable. Significance was accepted at the .05 level.

FINDINGS

Five hypotheses served as a basis for testing and analysis of the data revealed the following findings:

1. A significant difference existed between the scores of these elementary school students whose film viewings were interrupted and those whose were not.

2. A significant difference existed between the scores of the low intelligence students and high intelligence students whether the films were interrupted or not.

3. A significant difference existed between the scores of female students whose film showings were interrupted and those of male students whose were not.

4. A significant difference existed between the scores of sixth grade students and fourth grade students whether their film showings were interrupted or not.

5. No significant difference was found between the scores of low socio-economic level students whose film showings were interrupted and those of high socio-economic level whose showings were not, except at the sixth grade level specifically.

CONCLUSIONS

It may <u>not</u> be assumed that conclusions drawn from these data apply to any other groups other than those studied

in this investigation. The following conclusions may be drawn from this study:

1. Younger students have not developed the capacities of information integration and classification that older students have; hence they do not acquire as much factual data as older students do. Furthermore, interruptions bring interpolative data which either interfere with the memory trace or permit memory decay.

2. Low intelligence students, regardless of age, lack the capacity to classify and integrate factual data as well as high intelligence students with the aforementioned results.

3. Older girls, having become aware of societal expectations regarding their sex roles, may exhibit less interest in "unfeminine" subjects such as those chosen for the films in this study and consequently fail to classify and integrate factual data of this type. The same results would be forthcoming regardless of sex, age, or IQ if a student had personal reasons for being fearful, uninterested, or poorly motivated toward any given factual data.

4. Socio-Economic status alone does not affect one's ability to classify and integrate factual data. In fact low socio-economic students of normal or high intelligence may be more accustomed to interruptions in their home life since they tend to have less privacy and more siblings. However, it should also be recognized that students who are perceptive about their disadvantages may develop negative self-concepts which can interfere with all aspects of learning. These students will probably be affected negatively by interruptive elements as significantly as those with low IQ's.

IMPLICATIONS

Among the implications for the conclusions drawn from this study are the following:

1. Since short term interruptions do significantly reduce the amount of factual acquisition that intermediate level elementary school pupils obtain from motion picture films, film makers should use periodic summaries of important factual data in the films designated for these grade levels to minimize reduction from inadvertent interruptions or distractions.

2. Film makers should design films for several levels of intellectual abilities utilizing more summarization and repetition in both visual and audio channels for films designed for lower intelligence students.

3. Film makers should be knowledgeable about child developmental patterns including differences in perceptions of age, sex roles, and socio-economic level and design films accordingly.

4. Architects and school construction companies should design and build educational facilities which reduce interruptive elements, for example, carpeting to reduce sound interruption, limited fenestration to reduce playground and street distraction both audible and visible, and movable screens or wall partitions for use when needed.

5. Care should be taken by the classroom teacher, administrators, students, etc., to keep interruptions to an absolute minimum during learning activities. This may require new policies and procedures relating to use of public address systems in schools, visitors, and student behavior.

6. Projection equipment should be properly operated and studiously maintained to avoid interruptions caused by poor operating procedures or lack of adequate maintenance.

7. Learning goals and processes must be based on an individual's capability at a given point in time; low intelligence students must not be required to meet the same goals, in the same way, at the same speed as high intelligence students. After interruptions, teachers must be aware of the need to review preceding material and the value of a closing summary.

8. Teachers need greater awareness of children's developmental patterns, especially the implications of physiological, psychological, and social maturation. As children mature, their interests, needs, and capabilities change, which often means a change in the developmental patterns of intellectual growth, and in their general behavior patterns. Thus while younger children, on the whole, may be more affected by interruptions, some older individuals may still be significantly affected due to their interests or special concerns.

9. Observation and an awareness of different interests and maturation rates for males

and females at the sixth grade level suggest that these differences may be due to interest changes which are related to sex role, rather than sex per se. Sixth grade girls are typically less interested in nature studies as compared to their budding interest in the opposite sex. They typically develop some squeamishness at the thoughts of caterpillars, fish eggs, etc., which fourth grade girls have usually not developed to such a marked degree.

LIMITATIONS AND RECOMMENDATIONS

1. The results of this study must be considered only tentative until they are validated by further research under a variety of conditions and with a variety of subjects.

2. A multiple classification design for the analysis of variance and covariance might strengthen the validity of present results.

3. Replications should include varying durations of interruptions.

4. Some future studies should compare the effects of interruptions which are emotionally based with those which are not.

5. Replications should include additional variables, i.e., anxiety states, individual interest, and teacher influence, etc.

6. Further investigations should be made on the effects of interruptions on other learning factors besides factual acquisition, i.e., abstracting from factual data, analysing, synthesizing, creating, etc.

7. Future studies should investigate whether repeated interruptions bring about adjustive responses in the learner so that finally he is not adversely affected by them.

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APPENDIX

EXPERIMENTAL DESIGN WITH SUB-GROUP N'S

TREATMENT

	CONTROL												EXPERIMENTAL											
	4TH						6TH						4TH						6TH					
	Male			Female			Male			Female			Male			Female			Male			Female		
	Soc-Ec.			Soc-Ec.			Soc-Ec.			Soc-Ec.			Soc-Ec.			Soc-Ec.			Soc-Ec.			Soc-Ec.		
I.Q.	Hi	M	Lo	Hi	M	Lo	Hi	M	Lo	Hi	M	Lo	Hi	M	Lo	Hi	M	Lo	Hi	M	Lo	Hi	M	Lo	
Hi	7	0	5	6	1	3	12	3	2	8	4	1	12	1	2	9	5	2	7	4	2	9	1	2	108
M	3	5	1	1	2	3	2	5	1	1	2	3	5	2	3	5	5	1	2	0	3	3	2	1	61
Lo	0	2	4	1	1	2	5	3	1	1	2	5	1	1	4	0	1	0	0	2	6	1	2	2	47
	10	7	10	8	4	8	19	11	4	10	8	9	18	4	9	14	11	3	9	6	11	13	5	5	216
	27			20			34			27			31			28			26			23		
	47						61						59						49					
	108												108											
	216																							

NAME:_____

ROOM:_____

BUTTERFLIES

1. How large are cabbage butterfly eggs?_____
2. The four stages of butterfly development are:
   (1) _____
   (2) _____
   (3) _____
   (4) _____
3. How long does it take cabbage butterflies to hatch?

   _____
4. What holds the caterpillar in place while it wiggles out of its skin?_____
5. How long does a butterfly stay in the third stage of development? _____
6. When the adult emerges from the third stage of development, what must it do before it flys? _____
7. Name two ways the ichneumann fly destroys cabbage butterflies. (1)_____ (2)_____
8. Name two ways the swallowtail caterpillar defends itself against its enemies. (1)_____
   (2)_____
9. What happens to the body fluids of the swallowtail adult after it emerges from the chrysalis? _____

   _____
10. The swallowtail butterfly sheds its skin_____times.

11. What happens to the old skin after it is shed? _____

_____

12. How do butterflies aid in the propagation of flowers?

_____

NAME: _____

ROOM: _____

BARN SWALLOW

1. Barn swallows spend the winter in _____
2. Swallows can migrate as far as _____
3. During northern migration which leaves first, males or females? _____
4. Name two important things a swallow looks for in choosing a nesting site?
   (1) _____
   (2) _____
5. The swallows work on their nest only a little while each day because _____
6. What is used for lining in the nest? _____
   _____
7. How many eggs does the female lay? _____
8. What color are the eggs? _____
9. How are the baby birds fed? _____
   _____
10. How much do the babies eat in a day? _____
11. How old are the baby birds when they begin to grow feathers? _____
12. How old are the baby birds when they begin to fly and hunt insects for themselves? _____

NAME:_____

ROOM:_____

BIOGRAPHY OF A FISH

1. The stickleback gets its name from _____
2. The male stickleback is about _____ in length.
3. When building its nest, what does the stickleback do with pieces too light to stay down? _____

_____

4. How does the fish get the nest to stay together? _____

_____

5. When the stickleback finds a mate, he may try several ways to get her into the nest. Name two ways he may try.

   (1)_____

   (2)_____

6. When the female finishes depositing her eggs, the male then _____
7. Stickleback eggs are about the size of _____
8. Name four enemies of the stickleback which may eat the eggs. (1)_____ (2)_____ (3)_____ (4)_____
9. How long does it take the eggs to hatch? _____
10. If the tiny fish swim out of the nest, what does the father do? _____
11. How long does the father care for the small fry? _____

_____

12. The hungry pike did not eat the stickleback at first because_____

CHILD'S NAME:_____

GRADE:_____

Dear Parent,

A study is being conducted on how effectively your child learns from educational motion pictures. It would help a great deal if we had certain information about the child's opportunities for different experiences. I would appreciate it very much if you would respond frankly to the following questions; all information will be strictly confidential.

Gratefully,

Charles Andrews, Ass't. Professor
Department of Education and Psych.
Southeastern State College

1. Does your child mention it when he sees an educational film in school?

   Often Sometimes Never

2. Does he/she ever watch educational TV programs after school?

   Often Sometimes Never

3. Does he/she ever attend summer camps?

   Often Sometimes Never

4. If so, do they show educational films?

   Often Sometimes Never

5. Father's Occupation _____

   Mother's Occupation _____

6. Our total income for one year is:

   Less than four thousand dollars _____
   More than four but less than six thousand _____
   More than six but less than nine thousand _____
   More than nine but less than twelve thousand _____
   Twelve thousand or more _____

7. Our family takes at least one vacation a year on which we usually travel:

Yes No

100 miles _____
250 miles _____
500 miles _____
800 miles _____

8. Does your child have a private place to study?

Yes No

9. Does your child have a TV set in his room?

Yes No

10. In what order does your child prefer the following activities?

(Number 1, 2, 3 and 4)

Going to movies _____

Watching TV _____

Reading _____

Traveling _____


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