

THE EFFECTS OF COGNITIVE STYLE AND A SUPPLANTATION TECHNIQUE ON A
PICTURE DETAIL RECOGNITION TASK TAUGHT BY TELEVISION

by

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(ABSTRACT)

The purpose of this study was to determine the effects of a supplantation technique (zoom) on field dependent and field independent learners in the teaching of a picture detail recognition task through television.

Specific research questions included: will field dependent or independent cognitive style affect the student's ability to recognize picture details presented in a television format; will the zoom television technique affect the learning of a picture detail recognition task for students classified as field dependent or field independent; is there an interaction effect between cognitive style and television presentation mode; will recall increase across four learning trials, can the zoom technique be modeled successfully in other picture detail recognition tasks by field independent and field dependent subjects; and is there an interaction effect between the learning trials and the television presentation mode?

Students were shown two videotape treatments: one under the zoom condition which acted as a supplantation device and one under a

no-zoom treatment which withheld supplantation. A posttest only 2x2x4 repeated measures design was utilized. The independent variables were cognitive style, treatment condition, and learning trials. The dependent measures were four posttests measuring picture detail recognition.

Results indicate that the zoom treatment did not produce significantly higher picture detail recognition scores for either field independent or field dependent learners. Cognitive style had no significant effect on students' picture detail recognition ability in a learning task presented by television. Also, there was no significant interaction between the treatment and cognitive style. There was a significant difference in mean student performance across the four picture detail recognition tasks, as well as a significant interaction between the treatment condition and the learning trials.

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CHAPTER 1

INTRODUCTION

Cognitive style can be defined as how an individual perceives stimuli and processes raw data (Corvey & Ehrhardt, 1978). This is a very individual task and may differ to some extent for each human being. While 12 cognitive styles have been documented through research (Corvey & Ehrhardt, 1978), for purposes of this study, only field independent/ field dependent cognitive style will be considered (see Appendix A for definitions). Field dependent cognitive style can be defined as a person's tendency to see stimuli as holistic or global while field independent cognitive style can be defined as a tendency to experience items as discrete from their background (Kogan, 1971). Field independent individuals tend to extract a figure from its ground or background while field dependent individuals tend to see figures only in relation to their ground (Corvey & Ehrhardt, 1978, Witkin & Goodenough, 1981). Thus, it can be said that field independence/field dependence are two ways of perceiving figures in complex contexts. One style is not better than the other; rather, scores on tests developed to measure cognitive style fall on a continuum. Those on one side of the continuum are said to be more of one style than the other. The Concealed Figures Test or Group Embedded Figures Test (Witkin, Raskin, Oltman, & Karp, 1971) is usually used to determine this cognitive style. If a

person is able to easily discriminate simple figures in complex designs, the person is classified as field independent. Such persons are believed to have analytical perceptions because they easily extract simple figures from irrelevant contexts. People who have trouble doing this are classified as field dependent. These persons are believed to perceive globally, attending to the relationships between the lines rather than the outline of the simple figure (Corvey & Ehrhardt, 1978).

An important implication of cognitive style concerns how a learner perceives what is taught. If the individual's cognitive style hinders the processing of stimuli for one reason or another, then the task may not be learned. One way around this is to provide some assistance to the learner. Ausburn and Ausburn (1977) have termed this assistance "supplantation" because the learning task is broken down into its component parts and analyzed in terms of the individual's cognitive style. Wherever the breakdown in communication is found to be, that area is supplanted through some means which allows the learner to complete the task. It is this technique of supplantation which is to be investigated in the present study.

One means of supplantation is to provide the specific process that the students cannot provide themselves. What if a task requires a learner to locate specific items in a complex diagram and study their interrelationships? The learner must have visual discrimination skills in order to separate the detail from the

background. A knowledge of cognitive style indicates that field dependent students are likely to have trouble with this task because of their propensity to see a visual field holistically. The decreased ability to visually discriminate must be overcome or supplanted in order for the field dependent student to successfully learn the task. Generally, the focus of this study is to test a method by which the decreased ability of field dependent individuals to visually discriminate parts of a complex diagram may be overcome.

In a review of aptitude treatment interaction (ATI) literature, Ausburn and Ausburn (1978) have stated that research needs to be conducted utilizing interactions between cognitive style and presentation systems. Furthermore, the inability of a learner to transform stimuli into meaningful patterns which enable successful completion of a learning task is thought by Ausburn and Ausburn to be a vital research element for instructional designers.

PURPOSE OF THE STUDY

Specifically, the purpose of the study was to determine the effects of a particular supplantation technique (a zoom versus no-zoom treatment [see definition]) on a sample of students classified as field independent or field dependent learners in the teaching of a picture detail recognition task through television. The zoom technique was used to determine if field dependent learners' inherent decreased ability to focus on items in a visual field might

be aided or supplanted by its use. The television camera zoomed in on a detail in a picture and faded to black. The zoom technique provided the focus which field dependent learners by definition might not provide themselves. Another aspect of the study was to determine if the zoom technique could be modeled. Could it be learned and could the observation process be transferred to other learning tasks? The study also considered whether the posttest scores on a picture detail recognition task were affected by the interaction of the presentation mode characteristics and cognitive style characteristics.

The following research questions were developed:

1. Will field dependent or independent cognitive style affect the student's ability to recognize picture details presented in a television format?

2. Will the zoom television technique affect the learning of a picture detail recognition task for students classified as field dependent or field independent?

3. Is there an interaction effect between cognitive style and television presentation mode?

4. Will recall increase across four learning trials, and can the zoom technique be modeled successfully in other picture detail recognition tasks by field independent and field dependent subjects?

5. Is there an interaction effect between the learning trials and the television presentation mode?

CHAPTER 2

REVIEW OF LITERATURE

Media research has evolved a great deal from the early days when researchers tried to show the superiority of one medium over another. Researchers have begun to develop research based around medium message code characteristics apparent in different media (Nasser & McEwen, 1976). Medium message code characteristics can be defined as those attributes unique to each medium which the learner must understand in order to learn a given task presented by that medium. These include slow motion, split screen, and the zoom technique which are capabilities unique to film and television (Salomon, 1972). These message code characteristics have been compared to psychological requirements of the learning task and to learner characteristics. One of the most recent approaches to media research has been aptitude-treatment interaction (ATI) research (DiVesta, 1975). In this approach information processing provides the basis for interaction between learners and some instructional treatment. The aptitude of the learner is defined in terms of cognitive style, and the learning task is outlined by an instructional design which aids the student in achieving the learning task (Ausburn & Ausburn, 1977).

Aptitude Treatment Interaction and Cognitive Style

In their definitive book on ATI research, Cronbach and Snow (1977) point out the need for ATI hypotheses based upon information processing requirements of learning tasks and the abilities and preferences of learners for various types of processing. This notion of variation in cognitive style implies the existence of individual differences and preferences in actual modes of gaining, storing, processing, and using information. Kogan (1971) also points out that there is an empirical relationship among cognitive style, ability and achievement variables when the instructional design is altered for individuals. The learner's ability to master learning tasks in teaching situations is related to the individual and the instructional design used. Consequently, activities such as reading and other verbal skills, memory functioning, inductive reasoning, mathematical ability, and spatial ability are of extreme interest because classroom learning is directly affected by cognitive style variables when learning these tasks (Hempstead, 1973).

Within the general nature of cognitive functioning, stimuli which are perceived are not acted upon in their raw form; they are processed according to that individual's cognitive style and structure. Then, the processed stimuli are used to develop a solution to the problem with which the individual is confronted. Fletcher (1969) refers to this processing as transformation, and the resulting solution set is named generation. If the individual's

cognitive style, which dictates the manner of transformation, cannot for some reason process the stimuli, there may be a transformation process required for a given learning task. Thus, the learner may not be able to perform the learning task successfully.

DiVesta (1975) and Ausburn and Ausburn (1978) state that promising research opportunities in instructional design are offered through focusing on cognitive style as a research variable. This variable deals with learner modes and abilities in information processing and suggests study into interactions among learners, learning tasks, and instructional design. This approach is based upon discrepancies between the learner's information processing and the learner's ability to transform stimuli due to their cognitive styles and those specific abilities required by certain learning tasks. In the light of these learner task discrepancies, learners require assistance in order to generate correct solutions to a given task. As cited earlier, Ausburn and Ausburn have proposed a model for designing instruction which gives transformation help to learners in cases where their cognitive style characteristics are incompatible with learning task requirements. The relationship between the learner and the task is conceptualized as incomplete due to the learner's decreased ability to perform certain requirements for the task (Salomon, 1970; Salomon & Snow, 1968). Learners can be assisted in these transformations by supplantation, which may be defined as "the explicit and overt alteration or performance of a task requirement which a learner would otherwise have to perform

covertly for himself" (Ausburn & Ausburn, 1978, p. 343).

Salomon (1972) suggests that research designed to study the effects of supplantation techniques can compare instructional conditions that contain supplantation with those that lack supplantation. Hypotheses can be tested that predict that learners with opposite cognitive styles will benefit to differing degrees from the same supplantation technique. Dissimilar learning styles may interact differently with supplantation techniques. This may result in superior performance by learners with one cognitive style under one condition of supplantation and by learners of another cognitive style under a different condition of supplantation. Such research may lead to instructional design principles based on limited generalizations of treatment effects under specific interactions of learners and tasks, rather than a more generalized approach. Snow (1974) maintains that interactions will limit generalization of treatment effects, and research uniting cognitive style and supplantation will stress what Salomon and Clark (1977) call research on media as opposed to research with media. Such a focus on specific interactions between cognitive style and learning task based on supplantation theory may lead to an improved set of instructional design principles.

Field Dependent and Field Independent Cognitive Style

The concept of field dependence and field independence

developed out of laboratory studies conducted to determine perception of the upright (Asch & Witkin, 1948; Witkin, 1948, 1952; Witkin & Asch, 1948). While trying to determine how subjects locate the upright as quickly and accurately as they do, the researchers found that subjects were markedly different in their performance on these orientation tasks and that subjects were consistent in their ability to discern the upright across tasks. Tests of the upright measured a subject's ability to determine true horizontal and vertical in relation to space and gravity. This consistency across tasks by certain subjects suggested that people had preferred ways in which they assimilated information in order to determine the upright. This led to research to determine the characteristics of information processing used by these subjects in other perceptual domains. If subjects had trouble recognizing the upright, would they have trouble in disembedding an item from an organized field which did not involve perception of the upright? This led to the development of the Group Embedded Figures Test (Witkin, 1950) in which the subject was shown a simple figure and required to locate it in a complex design. It was found that those subjects who had trouble separating the simple figure from the complex also had trouble determining the vertical from the horizontal. This condition was labeled field dependent. People who found it easy to determine the horizontal from the vertical in space orientation tests were found to have little trouble in separating the simple figures from the complex. This condition was termed field independent (Witkin, Lewis, Hertzman, Machover,

Merssner, & Wapner, 1954).

Further research determined that field dependent individuals had difficulty in separating a part from the context in which it was embedded and restructuring the part in a different context (Glucksburg, 1956; Kogan, 1971; Witkin, Dyk, Faterson, Goodenough, & Karp, 1962). This suggested that the degree of the ability to disembed was revealed in a subject's perceptual as well as intellectual activities. Such research led to the expectation that field independent subjects would impose structure on a field, experience it as organized, and break up the organized pattern in order to expose the embedded figure in any context. Field dependent individuals, on the other hand, would simply leave the stimulus material in its whole state, and thereby, would be unable to assimilate it into a new pattern in order to facilitate any new problem solving activity (Witkin, et al. 1962).

This research into perceptual and intellectual functioning has led to the development of a theoretical model in which instructional design principles have been related to field independent and field dependent cognitive style (Ausburn & Ausburn, 1977; Kogan, 1971). The decreased ability of field dependent individuals to disembed parts from wholes is seen as a perceptual deficiency in some learning tasks. Perceptions are processed by individuals according to their cognitive style. If the individual cannot process the stimuli, then the task cannot be learned. This problem can be specifically adapted to field independent and dependent cognitive style. If a learner

cannot learn a given task because of his/her cognitive style, then some way must be found to help that learner overcome the problem so that the task can be learned. The diminished ability to learn a task is the inability of the field dependent person to disembed crucial patterns from a whole and to restructure them in such a way to facilitate the completion of a learning task (Kogan, 1971). A device must be identified which will compensate for the learner's inability to learn the task: the specific process must be identified and supplied to the learner. Suppose, moreover, that the task requires the learner to locate specific items on some complex diagram and compare them to other complicated parts of the diagram. A basic function required of the learner is the ability to visually discriminate and separate details from background. A knowledge of field independent/field dependent characteristics states that field dependent individuals are likely to have trouble performing this task. Their constricted field control will not enable them to visually discriminate the parts of a complex diagram and see interrelationships between the parts (Ausburn & Ausburn, 1978; Corvey & Ehrhardt, 1978; Witkin et al. 1962; Witkin & Goodenough, 1980). Thus, some means must be provided so that the field dependent learner can perform the learning task. One way to do this is to focus attention on clearly defined parts of the diagram. When the teacher realizes that the learning task may be impossible for some students to learn because of a difference in cognitive style, that teacher can develop an instructional design which will enable the student to

overcome the dilemma.

Cognitive Style, Media Language Formats, and Television Format Research

In order to understand how the mental skills which a learner brings to a mediated learning task relates to specific media, a discussion of media language formats unique to each medium is necessary. Media language formats (Salomon, 1972, 1974a) and medium message code characteristics (Eisner, 1970; Gombrich, 1972) are basically the same thing: they refer to those attributes unique to each medium which the learner must understand in order to learn a given task presented by that medium. These attributes are usually nonverbal. They refer to a subject's ability, for example, to determine spatial relationships when viewed on film or television, the ability to assimilate material when shown by different camera shots, or the ability to perceive contour on a flat map. Thus, it is important to identify the language formats of the media. Worth (1969) refers to these language formats as codes which the subject must fully understand in order to learn the message being transmitted by the medium.

Two separate functions are necessary to understand an idea presented through media because at least two representational systems are at work. One representational system is the idea itself which is being presented. The other is the means by which it is presented.

McLuhan (1965) would say that "the medium is the message." Once the idea is coded (in other words it has undergone modifications), it becomes a message whose content needs to be extracted and processed or decoded. Any time an idea is mediated, it is coded in a particular way by the language components of the medium. Just as verbal language is coded by a sender and decoded by the receiver of the message, visual language requires the same process. Decoding involves correcting or transforming the modification caused by a code, so that one is expected to fill in logical gaps caused by the editing of a film, to perceive elevation in a flat map, to create a cognitive map of a chain of events presented as fragments in a television program, or to transform a verbal statement into a figurative image (Bruner, 1964; Salomon, 1974b). Different people may be able to code and decode one medium but not an unfamiliar one. An individual may have learned the skills necessary to perceive elevation in a flat map, but may not be able to fill in logical gaps caused by the editing of a film.

Coding and decoding media messages involves media literacy skills which are especially critical in television formats because the format changes the appearance of a message. Television formats include the camera shot, the camera shot selection, and videotaped edits which change the visual message. The format affects the meaning extracted from the message, and the mental processes involved in message extraction (decoding) may be different even when the intended meanings may be the same. For example, a television frame

showing a close up and a wide view of the same scene directs the viewer to two different messages. In the close-up the intent may be to stress the detail, while in the wide view, the panorama of the scene may be the message intended for the viewer. Moreover, television images are pictorial in appearance, and television messages are concrete (Salomon, 1974a). Two skills may be affected by the pictorial and the concrete nature of the medium's messages: imagery ability and inference making ability. The concreteness of the television message arouses visual imagery, and television provides a ready model (Salomon, 1974a). The television picture is rich in detail and produces many visual images which can provide information to a viewer.

Witkin (1977) has stated that field dependency and independency is the cognitive style most relevant to television presentation mode characteristics. Since television formats have many visual cues which require encoding and decoding by a learner (Salomon, 1974a), field dependent people may have a problem in sorting out visual information which may be embedded in larger visual fields. One way to alleviate this problem is to provide the focus of the visual context enabling the field dependent learner to disembed the non-salient cues found in the larger context. Research on television formats versus written formats demonstrates that field dependent individuals show better achievement with television since structure is readily available (Kogan, 1971; Koran, 1969; Koran, Snow & McDonald, 1971). This may be true due to the ability of television

to manipulate the message by controlling the camera shot and the amount of detail seen by the viewer. How a televised image is perceived is influenced by a person's ability to encode and decode the visual field on the screen which is in turn directly affected by the person's cognitive style. A field dependent person may be unable to pick out the less noticeable cues in the visual field and may need some device provided by the television camera in order to disembed the information necessary to learn a given concept (Ausburn & Ausburn, 1978).

One such device which can be provided is the camera shot, that is how the camera is employed in conveying a learning task. The camera may be used for a long shot (relatively wide field) or a close-up in which the camera operator chooses to severely limit the field of vision. This critical format change deals with the relationship between selected parts of a visual field and between parts and wholes. A change in the camera shot can change the point of view of the learner and therefore change the message as well as what the learner perceives in order to solve or master the learning task (Salomon, 1974a).

The inability of the learner to bring the skill of inter-relating parts and wholes to bear upon close-ups will hinder the proper extraction of meaning (Ausburn & Ausburn, 1977, 1978; Salomon, 1974a). This is directly related to field dependent and field independent cognitive style (see earlier section on field independent/dependent cognitive style). By definition the field

dependent person is unable to separate parts from wholes without some compensatory device. Thus, two skills are then related to the camera shot which are critical in field dependent and independent individuals in order for the learner to properly extract the meaning and thereby complete the learning task. One is the ability to relate parts to perceptual wholes; the second is the ability to relate parts to inferred wholes (Salomon, 1974a). The angle of view of the camera determines whether part or all of an object or photograph is shown. The meaning conveyed to the viewer depends in part on the camera shot. If the camera employs a zoom-in technique, the viewer will see the whole field progressively restricted or narrowed to become a part of the whole. If two camera shots are shown whereby in one shot there is a wide field view while in the second shot there is a very narrow view, the learner will have a different perception because the two camera shots will differ in the amount of detail shown to the viewer.

It would seem that with the apparent efficacy of the television zoom shot that a great deal of research would be devoted to its use in instruction. This, however, was not the case. A review of the major works of instructional film research from 1918 to the present found only a few studies that deal with the zoom as a technique in making productions more interesting or more effective to the viewer. In this regard Hoban and Van Ormer's Instructional Film Research, 1918-1950 (1970), Gibson's classic works (1950, 1966), and May and Lumsdaine's Learning from Films (1958) yielded nothing. A

review of current journals including a review of film research from 1950-1975 also yielded no study of the zoom technique (Berry & Unwin, 1975).

According to a review of research on television message design by Coldevin (1981), only Salomon and Cohen (1977) were reported using the zoom technique. They found that zooming in from long shot to a close-up shot produced information gains significantly superior to a parallel version which used only wide and close up shots (no zoom). The zoom technique was used as a supplantation device while the alternate treatment tested the presence of media literacy skills. By cutting from a wide shot to a close up shot in the alternate treatment, gaps were left in the visual field which the student would have to transform internally. Observation of mean scores revealed that students under the zoom condition ($x=12.60$) scored significantly higher on a test of specific knowledge than students under the close up version ($x=9.84$). In contrast, Aylward (1960), Cobin and McIntyre (1961), and Dwyer (1970) reported that close-ups offered no significant advantage over long shots. However, interest levels were found to increase with medium close-ups (Ellery, 1959) or close-up shots (Wurtzel & Dominick, 1971-72).

The most interesting use of the zoom technique came from two Salomon (1972, 1974b) studies. In these studies, Salomon hypothesized that there are certain skills which must be developed and used in order to understand a medium's language of communication. Consequently, Salomon developed an experiment wherein he used three

paintings by Breughel and selected 80 details from each of the three paintings, totalling 240 details. He then developed three super 8mm film versions, each applying a different instructional treatment.

Treatment one (modeling version) used the zoom technique as a modeling condition which supplanted the media literacy skills that he supposed some students might lack. Treatment two (short-circuiting version) showed a whole picture followed by a detail and was repeated for each of the 240 details. The short-circuiting version was named to describe the omission of the transformation leading from the close up to the detail. While the modeling version used the zoom technique to lead the subjects from the whole picture to the close up detail, the short-circuiting version omitted the step, thereby creating a gap in the learning process. Treatment three (activation version) consisted of the three paintings shown as they were. The activation version described the omission of both the zoom and the detail treatment, leaving it to the subject to place order and select details from the whole picture. A control group was administered a posttest along with the other treatment groups. Students were asked to list as many of the details as they could remember. This raw score was regressed on a cue attendance pretest. Subjects (N=80) in all three groups showed significant differences on the cue-attendance posttest compared to the cue attendance pretest. The modeling (zoom) group ($x=31.3$) was not better than the activation (whole slide) group ($x=32.8$), but both were better than the short-circuiting (whole-detail) group ($x=25.1$) (Salomon, 1974b). Salomon reports,

"the results of this experiment lend tentative support to the two major hypotheses: 1. A filmic transformational scheme, in this case 'zooming in' and 'zooming out' is learnable; it can be used covertly in a similar task with new material (the cue-attendance posttest)" (Salomon, 1974b, p. 503). As a supplantation device, the zoom technique proved efficacious in improving cue attendance post test scores (Salomon, 1972, 1974b).

Modeling and the Television Zoom Technique

Salomon (1972, 1974b) reports that the zoom technique is a supplantation device which can be successfully modeled. For purposes of this study, modeling is the ability of a subject to internalize a technique and to imitate it. Internalization is accomplished when the subject reproduces, generalizes, and assimilates the technique into the general pattern of thinking separate from the immediate task (Minkowich, 1966). In film and television formats, subjects think in terms of zoom, slow motion, or split-screen. Imitation is the ability of the subject to replicate the technique at another time. Piaget (1962) notes that imitation is an important consideration in the development of intelligence. Imitation is internalized and leads to the development of mental images which form patterns that subjects may recall in similar situations.

Salomon and Snow (1968) and Salomon (1970) note that in order for internalization, imitation, and thus modeling to be successful,

the action to be modeled must be compatible with the learner's existing system of placing order on the task. Furthermore, the new task to be modeled must be capable of replacing or complementing mental operations already meaningful to the learner. This ability to internalize, imitate, and successfully model a condition depends upon the ability of the task or technique to supplant the learner's existing operational system. For example, a film which shows how a circuit diagram is traced, taken apart circuit by circuit, and reassembled acts as a supplantation device which the learner would normally have to provide. Referring to Witkin's (1950) discussion of how subjects handle embedded figures or restructure the field, this demonstrates that the film process supplants the subject's process of thinking about the circuit diagram. A learner who is exposed to a media technique which supplants a mental process is, therefore, likely to imitate, internalize, and generalize the task or technique in subsequent learning (Salomon, 1972, 1974b; Snow, 1970).

In terms of Salomon's studies, the zoom technique is a supplantation device which provides a transformation for the learner. Salomon singles out items and gradually zooms in on them; the transformation is made from the initial state, through the transformation (zoom) to the resultant state (a specific detail) (Salomon, 1974b). Learners are expected to internalize, imitate, and thus, model the presented transformation (zoom) which becomes a supplantation device.

SUMMARY

This review of literature has revealed a clear need for studies which deal with supplantation in relation to cognitive style. Cronbach and Snow (1977) point out the need for studies dealing with the information processing requirements of learning tasks. Hempstead (1973) notes that classroom learning is directly affected by cognitive style variables when learning most mastery skills. Fletcher (1969) states that stimuli are processed according to one's cognitive style, and consequently, Ausburn and Ausburn (1978) argue that when a learner's manner of transforming stimuli prevents the successful completion of a learning task, some way must be found to overcome this stumbling block. Moreover, they argue that this is the primacy of cognitive style as a research variable: it deals with learner modes and abilities in information processing, and as such the approach is based upon discrepancies between how a student processes information compared to how the student transforms stimuli. When learner discrepancies are evident, a model must be found to overcome them. In the same vein, Salomon (1972) suggests research designed to study the effects of supplantation techniques in instructional conditions where supplantation is applied and where it is withheld.

Furthermore, Witkin (1977) argues that television presentation mode characteristics are most relevant to field independent and dependent cognitive styles. Research on television

formats versus written formats shows that field dependent individuals exhibit better achievement with television since structure is readily available (Kogan, 1971). How a televised image is perceived is influenced by the ability to encode and decode the visual field which is directly affected by the cognitive style. Consequently, a field dependent person will be unable to select specific parts of a visual field and will need some means to select the proper information.

Salomon (1974a) argues that the employment of the camera shot affects the student's imagery and inference making ability. Salomon (1974b) notes that television formats have many visual cues which must be encoded and decoded. Because field dependent persons may not be able to sort out the visual field, Salomon argues, the camera shot is critical. Consequently, researchers have pointed out the need for instructional designs where television camera shot techniques are employed as supplantation devices for field dependent learners, hypothesizing that field dependent individuals will benefit from the use of the television shot as a supplantation device.

In the only research study to date to employ the zoom technique, Salomon (1974b) used the television zoom camera shot as an approach to improving cue attendance ability. Salomon has also used the zoom technique as a supplantation device which subjects may imitate, internalize into a subject's general pattern of thought, and model. Moreover, Witkin (1977) and Gross (1974) have argued, as stated previously, that the television camera shot properly employed may aid field dependent learners. However, the only empirical

evidence to date concerning the efficacy of the zoom technique has been reported by Salomon (Salomon, 1972, 1974a, 1974b; Salomon & Cohen, 1977).

A review of this literature has led to several research questions which have not previously been explored: 1) will field dependent or field independent cognitive style affect the students' ability to recognize picture details presented in a television format?, 2) will the zoom television technique affect the learning of a picture detail recognition task for students classified as field dependent or field independent?, 3) is there an interaction between cognitive style and the television medium message formats?, 4) will recall increase across four learning trials, and can the zoom technique be modeled successfully in other picture detail recognition tasks by field independent and field dependent subjects?, and 5) is there an interaction effect between the learning trials and the television presentation mode? This study will be concerned with answering these research questions.

CHAPTER 3

METHODOLOGY

In the review of literature, a case was made for exploring cognitive style in relation to media presentation mode, specifically the zoom camera shot as a supplantation device and as an aid to field dependent learners who were unable to disembed specific stimuli from an entire visual field. Several research questions were cited which had not been explored in earlier research.

These questions formed the basis of this study. This chapter explored the process through which these questions would be answered. It contained the hypotheses, an analysis of the subjects, the development of the instrument, the research procedures, and the research design.

HYPOTHESES

Based upon the research of Witkin (1948, 1950, 1952), Witkin, Moore, Goodenough, and Cox (1977), Salomon (1972, 1974a, 1974b), and Ausburn and Ausburn (1977, 1978) and based upon the research questions in Chapter 1, null hypotheses were developed as follows:

- 1) There is no difference between field independent and field dependent subjects in terms of mean student performance across

a series of four picture detail recognition tasks.

2) There is no difference between students assigned to the two presentation modes (zoom versus no zoom presentation) in terms of mean student performance across a series of four picture detail recognition tasks.

3) There is no interaction between field independent and dependent cognitive style and zoom versus no zoom television presentations of a picture detail recognition task.

4) There is no difference in mean student performance across a series of four picture detail recognition tasks.

5) There is no interaction between presentation mode and learning trials.

SUBJECTS

Participants in this study were Composition I and II students at Bluefield State College (BSC) located in Bluefield, WV. Eight groups of Composition students were selected because they were drawn from all curricula at BSC in order to assure an accurate cross section of the student population. They must have had American College Test (ACT) scores of 13 or above to enroll in Composition, and thus ACT scores ranged from 13 to 30. The most popular majors at BSC in which these students studied were business, engineering technology, nursing, and education. All were commuting students. Furthermore, since Composition was not always taken as a second

semester freshman course as in a more traditional college, the likelihood of the distribution containing sophomores, juniors, and seniors was increased. Lastly, eight groups were chosen with 119 students in order to accurately represent the total BSC population (1700 full time students).

DEVELOPMENT OF THE INSTRUMENT

The effectiveness of the zoom/no-zoom treatment was evaluated by specially developed measures of visual perception. For these measures four Picasso paintings were selected as follows: "Interior with a Girl Drawing," "Mandolin and Guitar," "Night Fishing at Antibes," and "Bullfight" (Alberti, 1971; Center for Humanities, 1971; Duncan, 1968; Jaffe, 1973; Penrose, 1968). Picasso's works were chosen for the extreme amount of detail available which would aid in selecting similar yet different details in sufficient number to complete the study.

Two 400 second silent color videotapes were developed. Color slides of each of the four paintings were projected on a screen, and a color television camera was aimed so as to accurately portray each painting on the videotape. The 20 close-up shots of each painting were randomly selected. This was done to provide an adequate number of detail shots for subjects to remember, thus increasing the likelihood of an adequate range of scores on the recognition tests.

In videotape A (the zoom treatment), the camera zoomed in on

details in a random sequence, for example a facial expression or a hand, and faded to black. In each case 20 details per painting were chosen, totalling 60 details for three paintings. The fourth painting was a wide angle view of the picture exactly the same as the no-zoom version. In the first three trials of the zoom treatment, the subjects were exposed to the zooming effect; however, the fourth trial was used to see if the zoom condition could be modeled. In each case the detail was zoomed in on, held for 5 seconds, and faded to black, making videotape A (the zoom treatment) 400 seconds long. The time of 5 seconds was chosen because $20 \text{ details} \times 5 \text{ seconds} \times 3 \text{ paintings} + 100 \text{ seconds for the fourth painting}$ equalled 400 seconds, making the length of the zoom treatment equal to the length of the no-zoom treatment. Five seconds duration per detail was felt to be enough time to complete the zoom without cutting away so quickly that the students would become disoriented. The time that the screen faded to black amounted to 2 seconds for each detail, but this time was not included in the total time that images remained on screen since students saw nothing at these times.

In each of the zoom shots, the distance of the camera from the object and the time of the zoom itself remained constant as did the size of the image after the zoom with the television as the point of reference. The camera zoomed in on each detail from the same location for the same amount of time in each detail.

In videotape B (the no-zoom treatment), each of the Picasso paintings was fully shown on the television screen for 100 seconds

each and faded to black, making the length of the second tape 400 seconds. The pictures in the no-zoom treatment were shown in the same order as in the zoom treatment. The only difference between the two treatment tapes was that treatment tape A employed the zoom technique, while treatment tape B employed the no-zoom technique.

The dependent measures consisted of four ten item posttests with five choices. The object of the dependent measures was to test for picture recognition of details that had been seen by the students in the treatment groups. Thus, five details from Picasso paintings were videotaped simultaneously, thereby allowing the students to see them together on the television screen. This was done by placing five detail slides photographed from Picasso paintings on a light table and covering all but the 2x2 slides with a black template (see appendix G for posttest items and template). This masked out all light but not the details themselves. A television camera was focused on the five slides and framed into a television screen. Test frame one appeared in the upper left corner; test frame two appeared in the upper right corner; test frame three appeared in the center of the television screen; test frame four appeared in the lower left corner of the screen, while test frame five appeared in the lower right side of the screen. From looking at the five details simultaneously, the students were to select the one detail seen previously in the treatment picture. In each test frame only one of the five details came from the treatment picture previously seen. This was repeated for all 40 items. In each case the test item

containing five details was faded in, held for 10 seconds, and faded to black. Also, in each instance students had 10 seconds to mark the answer sheet before proceeding to the next item. To aid the students in matching the test item to the answer sheet, an Arabic number was placed on each test frame and during the 10 seconds of black following each item. By looking at the blank screen with the Arabic number, students would know which question they should be answering before a new test item was seen.

This particular development of the instrument was designed to conform the present research to similar research by Salomon utilizing the zoom technique (Salomon, 1972, 1974b). Paintings had been chosen because of the richness of similar detail and because they could readily be transferred to a video format. The crux of this study was to determine whether field dependent subjects could be aided in the recall of a learning task through the use of the zoom television shot as a supplantation device. In this case one treatment (zoom) provided the supplantation device, and another treatment presented the learning task without a supplantation device. In each treatment, but especially in the zoom treatment, the time each slide was shown was restricted in order to overcome visual studies which pointed to 90 percent recall of slides shown in a series (Standing, Conezio, & Haber, 1970). It was felt that if the details were left on the television screen too long, picture detail recognition would be too easy and high posttest scores across all four trials by a majority of subjects would occur. In treatment B (the no-zoom treatment) where

each slide was shown for 100 seconds, the depth and richness of detail aided in increasing the variance of raw scores on the dependent measures.

RESEARCH PROCEDURES

Students were first classified as field independent or dependent by using the Group Embedded Figures Test (GEFT) used so often as a measure of cognitive style (Witkin, Oltman, Raskin, & Karp, 1971). The test took approximately 15 minutes to administer including exactly 12 minutes for the students to take the test (see Appendix B for the directions given for taking the GEFT). The test was composed of simple geometric figures that were located in larger geometric figures. The object of the test was to pick out the simple geometric figures and mark them in the test booklet within a given time frame. Those scoring 10 or above were classified as field independent, and those scoring ten or below were classified as field dependent (Baron, 1979). (See Appendix H for a breakdown of GEFT raw scores by subjects). For the 119 subjects taking the 18 item test, the raw score mean was 8.77 while the standard deviation was 4.96.

After completing the GEFT, students were asked to complete a demographic survey, including age, sex, and class. While these data were not pertinent to the hypotheses being tested, they were collected for additional observations and comparisons if needed.

Lastly, students were asked to observe the videotaped

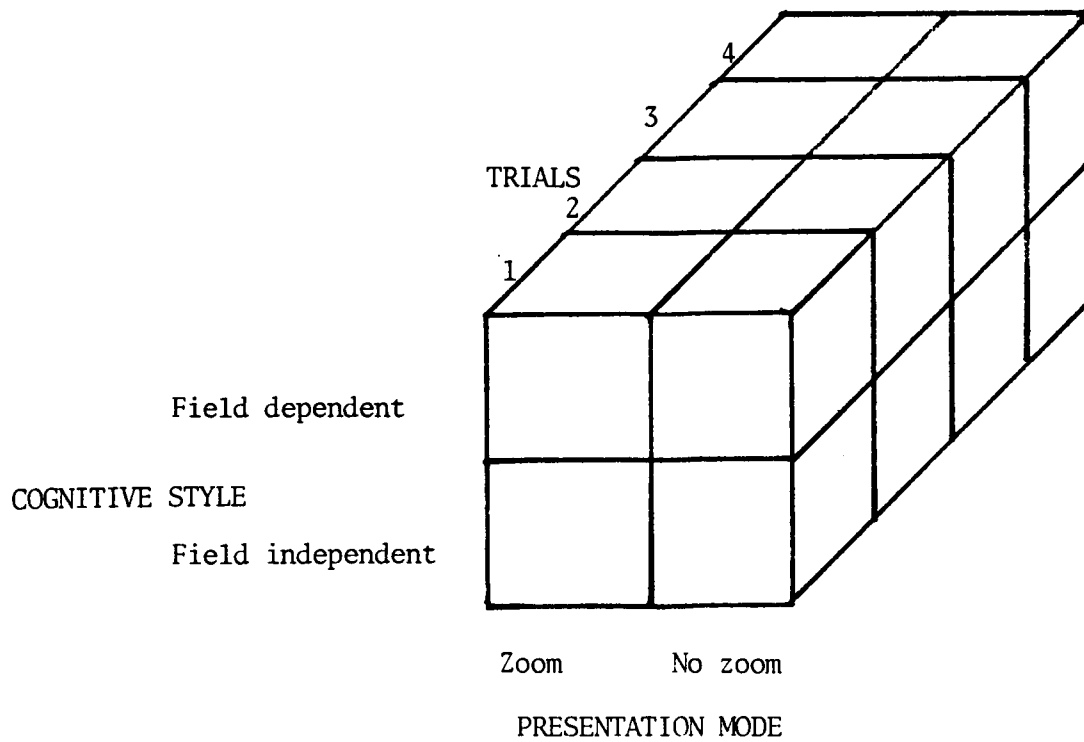
treatment presentations (see earlier explanation of videotape design and content and see Appendix C for the directions for completing treatments, Appendix E for the no zoom treatment pictures, and Appendix F for the zoom treatment details). Two videotapes were produced--a zoom format version and a no-zoom format version. Of the eight Composition sections, four sections randomly selected viewed the zoom version, while four sections viewed the no-zoom version. Each class viewed the tapes on four 21" Sony monitors. Students were seated in rows of three, two rows per television. In each case students were encouraged to sit in seats directly in front of the televisions. One hundred nineteen subjects sat in groups of three to six in front of the 21" Sony color television sets. After viewing each Picasso picture in treatment A or treatment B, the videotape was stopped, and directions for completing a ten item multiple-choice exam were administered to each student and repeated four times, once for each picture (see Appendix G for all posttest visuals and Appendix D for the answer sheet). The videotape was restarted with the next treatment picture or posttest after directions were completed.

Each of the eight Composition classes was tested by the author over a two day period. The treatments and posttests were administered in the same order and in the same time frame -- eight times, once to each class. GEFT took 15 minutes to administer while the treatments and posttests took 30 minutes to administer. In each case packets containing test information were distributed first

followed by the administration of GEFT. Directions for completing the treatment were given followed by viewing the first picture of the treatment (either zoom or no zoom — 100 seconds). Students were then given the directions for completing the posttest to the first picture and the videotape was restarted (the posttests were edited into the tape directly after each picture). Each posttest was 200 seconds in length. This procedure was repeated for the next three pictures. All students remained seated until the entire treatment and tests were completed and until the packets were collected.

RESEARCH DESIGN

A 2x2x4 factorial analysis of variance was used to analyze the data with the last factor (trials) representing the repeated measure. It may be visualized as follows:



2x2x4 FACTORIAL ANALYSIS OF VARIANCE
WITH REPEATED MEASURES ON THE LAST FACTOR (TRIALS)

CHAPTER 4

RESULTS

The purpose of this study was to investigate the effects of the zoom and no-zoom television treatment on field dependent and field independent cognitive styles as measured by performance on four posttests of ten items each. Each test requested recognition of visual details taken from four Picasso paintings.

Each student's cognitive style was determined by the Group Embedded Figures Test (GEFT) (Witkin, et. al., 1971). In order to divide the students into field dependent and field independent cognitive styles, the 0-9 range was determined to be field dependent while the 10-18 range was determined to be field independent. A review of prior research indicated that one means by which researchers divided field independency from field dependency using the Embedded Figures Test was to use the mean score as the demarcation point (Baron, 1979). Since 8.77 was the mean score for the 119 students used in the study, nine was used as the dividing score between field dependency and independency. Of the 68 field dependent students, the mean was 4.97 while the standard deviation was 2.71. For the field independent students (n=51), the mean was 13.31 and the standard deviation was 2.98.

Demographic data was collected from a sample of the population as to treatment, cognitive style, sex, and age. A

tabulation of the demographic data is listed in Appendix G.

ANALYSIS OF THE HYPOTHESES

A 2x2x4 factorial analysis of variance was used to analyze the data with the last factor (trials) representing the repeated measure. The repeated measures design allowed the experimenter to study rates of learning as measured by the four posttest scores as a function of treatment effects. Since differences across subjects were often quite large relative to differences in treatment effects being evaluated, the repeated measures design offered increased statistical power over the standard factorial analysis of variance. Another advantage was in economy of subjects (Winer, 1971).

A significance level of .05 was set for all tests of the null hypotheses. Table 1 provides a summary of mean scores by independent variables across all four posttests. Table 2 contains the summary of the analysis of variance. The first research question tested was whether field dependent or field independent cognitive style would affect the student's ability to recognize picture details presented in a television format. The null hypothesis can be stated as follows: there is no difference between field independent and field dependent subjects in terms of mean student performance across a series of four picture detail recognition tasks.

The analysis of variance is summarized in Table 2. The main effect of cognitive style was not significant, $F(1,115) = 0.11$,

$p > .05$. Therefore, the null hypothesis was not rejected.

The second research question investigated was whether the zoom television technique would affect the learning of a picture detail recognition task for students classified as field dependent or independent. The resulting null hypothesis stated that: there is no difference between students assigned to the two presentation modes (zoom versus no-zoom presentation) in terms of mean student performance across a series of four picture detail recognition tasks.

The summary table of the analysis of variance shows that the F-ratio for presentation mode was not significant at the .05 level, $F(1,115) = 0.80$, $p > .05$. Therefore, the null hypothesis was not rejected.

Inspection of the zoom and no-zoom treatment means reveals that those students under the zoom treatment ($\bar{x}=5.24$) did score higher on the recall posttests than the students under the no zoom treatment condition ($\bar{x}=5.06$). However, in the case of trial three, this was not true. Under the zoom condition ($\bar{x}=2.97$) on trial three, students scored lower than under the no-zoom condition ($\bar{x}=3.41$). The zoom and no-zoom treatment means were not significantly different.

Table 1
Summary Table of Means by Independent Variables across Trials

Cognitive style	Treatment													
	Zoom							No Zoom						
	Trials							Trials						
	T1	T2	T3	T4	M	n		T1	T2	T3	T4	M	n	
Field Dependent	n=39													
	M	5.35	5.94	3.20	6.82	5.33	5.17	5.13	3.03	6.13	4.87	5.27	5.59	3.13
	SD	1.53	1.84	1.82	1.62		1.60	1.76	2.52	1.80				
Field Independent	n=29													
	M	5.51	5.75	2.65	6.58	5.12	5.50	5.18	3.90	6.63	5.30	5.51	5.50	3.19
	SD	1.12	1.55	1.51	1.37		1.40	1.29	1.84	1.73				
Total	n=68													
	M	5.42	5.86	2.97	6.72	5.24	5.31	5.15	3.41	6.35	5.06	5.39	5.54	3.16
Trials														

Note: Maximum score possible on each post test=10

Table 2
Summary of Analysis of Variance

Source of Variation	SS	df	MS	F
<u>Between subjects</u>				
A (zoom/no zoom treatment)	4.09	1	4.09	0.80
B (cognitive style)	0.56	1	0.56	0.11
A*B	11.71	1	11.71	2.28
Subjects within groups error (between)	590.25	115	5.13	
<u>Within subjects</u>				
C (trials)	735.38	3	245.12	118.02 *
A*C	20.60	3	6.86	3.31 **
B*C	1.52	3	0.50	0.25
A*B*C	7.18	3	2.39	1.15
C x subjects within groups error (within)	716.54	345	2.07	

* $p < .0001$

** $p < .05$

The third research question was whether there was an interaction effect between cognitive style and the presentation mode. The resulting null hypothesis was that: there is no interaction between cognitive style (field independent and field dependent) and television presentation modes (zoom versus no-zoom) of a learning task.

No significant interaction took place between cognitive style and presentation mode, $F(1,115) = 2.28$, $p > .05$ (see Table 2). Thus, the null hypothesis was not rejected.

Under the zoom treatment, the field dependent individuals ($\bar{x}=5.33$) scored higher than the field independent individuals ($\bar{x}=5.12$), whereas under the no-zoom condition, the field independent individuals ($\bar{x}=5.30$) scored higher than field dependent individuals ($\bar{x}=4.87$) across the four learning trials. Although these results are in the hypothesized pattern, the interaction effect was not significant and thus must be considered a chance outcome.

A major concern of this study was to determine the influence of the zoom/no-zoom technique among field dependent individuals. While there was no significant interaction between presentation mode and cognitive style, a secondary analysis was conducted using only field dependence and presentation mode (zoom/no-zoom treatments). The scores of the four posttests in each presentation mode were combined by adding the raw scores of each student across trials to derive a total raw score on the four trials. A one-way analysis of variance was generated. The results indicate that there was no

significant difference, [$F(1,66) = 1.12, p > .05$], due to treatment effects on field dependent subjects. See Table 3 for the summary of this analysis of variance.

Table 3

Analysis of Variance Summary

Source	SS	df	MS	F
Field dependent	708.176	1	708.176	1.12
Error	41763.942	66	632.287	

One of the purposes of using the repeated measures design was to study picture detail recognition across four learning trials as a function of treatment effects. In the repeated measures design, there were four sets of posttest scores for each subject. While the dependent variable consisted of scores on the posttests, the order in which they appeared constituted an independent variable with values of one through four. While the order of the first three trials was not of interest, the fourth trial was used to test the efficacy of the modeling effect. Thus, a third independent variable of the study other than cognitive style and presentation mode was the learning trials.

This led to two subsequent hypotheses: first, there is no difference in mean student performance across a series of four

picture detail recognition tasks. The analysis of variance showed that the F-ratio for learning trials was significant, $F(3,345) = 118.02$, $p < .05$ (see Table 2). Therefore, the null hypothesis was rejected.

Secondly, there is no interaction between presentation mode (zoom versus no-zoom treatment) and learning trials. There was a significant interaction between trials and treatment condition, $F(3,345) = 3.31$, $p < .05$ (see Table 2). The null hypothesis was rejected.

Figure 1 shows a comparison of treatment means across all four trials. In three of the four learning trials, the zoom treatment means were higher than the no-zoom treatment means. However, the reverse was true for the third trial.

SUMMARY

In this chapter the results of the study of cognitive style and the zoom versus no-zoom presentation mode were presented. The results indicated the following:

1) There was no significant difference between field independent and field dependent subjects in terms of mean student performance across a series of picture detail recognition tasks.

2) There was no significant difference between students assigned to the two presentation modes (zoom versus no-zoom presentation) in terms of mean student performance across a series of

four picture detail recognition tasks.

3) There was no significant interaction between cognitive style and presentation mode.

4) There was a significant difference in student achievement on a picture detail recognition task based upon learning trials.

5) There was a significant interaction between presentation mode and learning trials.

The summary and discussion are presented in Chapter 5.

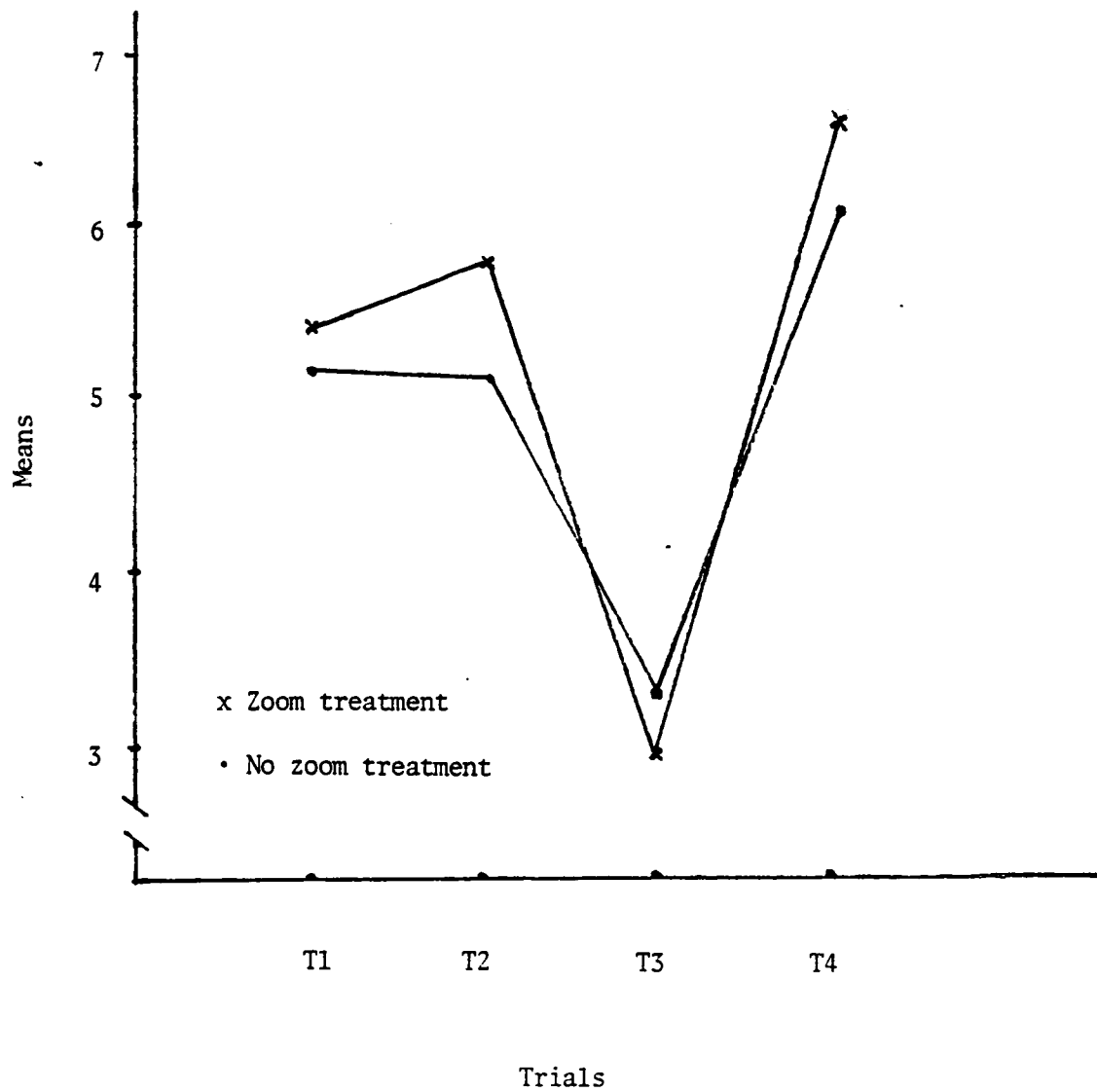


Figure 1. Graph of treatment means over trials.

CHAPTER 5

SUMMARY AND DISCUSSION

In their review of aptitude treatment interaction (ATI) research, Ausburn and Ausburn (1978) noted that research needed to be conducted looking specifically for interactions between cognitive style and presentation systems. Furthermore, they noted that the inability of a learner to transform stimuli into meaningful patterns which would enable successful completion of a visual task was a vital research element which had not been researched in depth. Ausburn and Ausburn termed the means by which stimuli could be transformed into learnable patterns supplantation and noted that specific research should be done with the process of supplantation. Salomon and Clark (1977) suggested that particular media attributes should be singled out for study. Salomon (1974a) noted that different people may be able to code and decode one medium but not another with which they are unfamiliar. This ability was seen to be especially critical in television formats because a critical format changed the appearance of a message (Salomon, 1974; Witkin, 1977). Witkin (1977) stated that field dependency and independency was the cognitive style most relevant to television presentation mode characteristics. Since television formats had many visual cues which

required encoding and decoding by a learner (Salomon, 1980), field dependent people might have a problem in sorting out visual information embedded in larger visual fields. A possible way to alleviate this problem was to provide the focus of the visual context, thus enabling the field dependent learner to disembed cues found in the larger context. Witkin (1977) noted that field dependent individuals might have trouble sorting out parts of a visual field especially in the television medium, and Ausburn and Ausburn (1978) noted that treatments with supplantation and treatments without supplantation should be developed to compare their effectiveness simultaneously. This study was conceived in order to explore some of these questions. A television zoom treatment was devised as a supplantation process and a no-zoom treatment was devised to withhold supplantation in order to study whether field dependent individuals could improve learning as measured by visual recognition posttests. It was felt that the zoom television treatment would provide the focus to enable field dependent learners to sort out visual information which was embedded in larger visual fields.

Purpose of the Study

Five research questions were developed for this study. First, would field dependent or independent cognitive style affect the student's ability to recognize picture details presented in a

television format? Second, would the zoom television technique affect the learning of a picture detail recognition task for students classified as field dependent or field independent? Third, was there an interaction effect between cognitive style and television presentation mode? Fourth, would recognition increase across four learning trials, and could the zoom technique be modeled successfully in other picture detail recognition tasks by field independent and field dependent subjects? Fifth, was there an interaction effect between the learning trials and television presentation modes? Specifically, then, the purpose of the study was to determine the effects of a supplantation technique (a zoom treatment) on a population of students identified as field independent and field dependent learners in the teaching of a picture detail recognition task through television.

Procedure

One hundred nineteen undergraduates from classes at Bluefield State College were chosen to participate in the study. Two treatments were developed, the zoom television treatment and the no-zoom television treatment. The zoom television treatment consisted of viewing four Picasso paintings shown one at a time. With each painting, the television camera showed the entire painting and then zoomed in on a detail in the painting. This was repeated until 20 different details had been shown and was followed by a posttest.

This procedure was repeated for the next two paintings. The final painting was shown in its entirety without the benefit of zooming. This was done in order to see if the zoom technique was learned in the prior three paintings and if the zoom condition could be modeled. A fourth posttest followed the final painting. The no-zoom treatment consisted of the same four Picasso paintings shown in their entirety for 100 seconds each with ten item posttests following each painting. Both treatments were of 400 seconds duration.

After each painting was shown in each treatment, a ten item posttest was administered. These posttests were edited into the treatment tapes directly after each painting. Each posttest item consisted of five details of five Picasso paintings with only one of the five details coming from the Picasso painting just seen. The task was to recognize correctly the visual detail seen previously.

Four groups received the zoom treatment and four groups received the no zoom treatment. The students were tested in their regular classroom setting. All testing took place in the same room with four 21" Sony color television sets in order that a maximum of six students be placed in front of each television. The treatments were randomly assigned to each of the eight groups. Each session used the same procedure and was conducted under the same conditions. The Group Embedded Figures Test was administered, and lastly, the treatment tape was shown.

Results

A 2x2x4 factorial analysis of variance was used to analyze the data with the last factor (trials) representing the repeated measure. The dependent measures were four posttests of ten items each which measured picture detail recognition.

The analysis of variance of the main effects (cognitive style and treatment) produced no significant results. There was also no significant interaction between cognitive style and treatment. However, the main effect, trials, was significant, $F(3,345) = 118.02$, $p < .05$, and the interaction between the treatments and learning trials was significant, $F(3,345) = 3.31$, $p < .05$. In Figure 1 a comparison of treatment means across all four trials shows that in three of the four trials, the zoom treatment means were slightly higher than the no zoom treatment means. However, the reverse was true for the third trial.

DISCUSSION

One of the purposes of this study was to determine whether field dependent subjects could improve picture detail recognition through the use of the zoom television shot which would serve as a supplantation device. Previous studies which discussed the use of supplantation conducted by Salomon and Cohen (1977), found that zooming from a long shot to a close-up produced higher recall scores

among students significantly superior to a close-up version (the whole picture was shown and immediately cut to a detail). Salomon (1974b) found that the zoom technique group exhibited higher posttest scores when compared to a whole detail group but scored no higher than the whole picture group.

The design of the Salomon study might be flawed and therefore suspect. The Salomon study used three 8mm film segments and as a post test requested that students list as many of 240 details as they could remember. This listing was not timed. A proctor was present to answer student questions including whether they were answering the posttest correctly. Extraneous room lighting was difficult to control because 8mm film would require shades to be pulled and seating could be crucial to performance unless there were no windows. Moreover, with 20 students, seating in relation to the screen might be crucial. Students sitting on the outside on the peripheral edges particularly might have had problems with adequately seeing the treatment. Raw scores were determined by the total number of details remembered. But since no time limit was set and since a proctor helped students who needed help and thus guided them, the raw scores could be suspect. It might have been better to have more control over the posttest and the time and treatment parameters. Because these conditions may have allowed extraneous variables to cast some doubt on the design, the resulting conclusions supporting the efficacy of the zoom treatment might also be questioned.

The present study was designed to have better control over

these extraneous variables. By using videotape, the treatments and the posttests were controlled for lighting and seating as well as the important extraneous variable -- time. Also, the posttests were designed to select 50 percent of the details for recognition on each posttest whereas the Salomon study left selection of detail (240 total) to the individual student. Salomon's organization in structuring the posttest may have created a problem because students who placed wrong details on the posttest were asked to mark them out and replace them with other details. In conclusion, it was felt that the present study was better designed because of its control over extraneous variables, its simplicity, and its structure.

The analysis revealed no significant mean differences for either of the main effects of substantive interest (cognitive style and treatment condition) nor for the interaction between these two factors. Even though the results were not significant, the mean differences were as hypothesized. Under the zoom condition, field dependents scored slightly higher than field independents ($\bar{x}=5.33$ vs. 5.12), whereas under the no zoom condition, field independents scored higher than field dependents ($\bar{x}=5.30$ vs. 4.87). However, a secondary analysis comparing field dependent subjects under treatment conditions (zoom/no-zoom treatment) reinforced this non-significant result.

The only significant differences were associated with the main effect for trials and the interaction effect between treatment and trials. The interaction reflected the fact that for all but the

third trial, the zoom group outscored the no-zoom group. However, as shown in Figure 1, the reverse was true for the third trial. Under the zoom treatment, the mean score was 2.97, while under the no-zoom treatment, the mean score was 3.41. On the fourth trial, mean scores were highest under the zoom condition ($x=6.72$ vs. 6.35). Upon observation the mean scores on trial four appear not to be significant.

The significant effect for trials reflects the fact that trial three was much more difficult than the other three trials. The stimulus material used in trial three was no doubt the factor which caused this condition. Trial three was taken from the Picasso painting "Night Fishing at Antibes". It had very little contrast and was the least colorful of the four paintings because it depicted a night scene. This appeared to constitute a very difficult trial and probably contributed to low mean scores for both groups. This was the only trial in which students under the zoom condition exhibited lower mean scores than students under the no-zoom condition. The significant effect was probably due to this flawed trial, but this anomaly was of no scientific or theoretical interest.

Salomon (1972, 1974b) and Salomon and Cohen (1977) reported that the zoom technique was effective in the recall of detail when compared to other mediated versions of a learning task. Aylward (1960), Cobin and McIntyre (1961), and Dwyer (1970) reported that the camera shot (eg. long shot, close up, or zoom) made no difference on recall measures. The results of this study are somewhat

contradictory to what Salomon reports concerning the use of the zoom technique, but not necessarily contradictory to his results. This study tends to support Aylward, Cobin and McIntyre, and Dwyer's contention that the camera shot makes no difference on measures of student recall. Future researchers may wish to analyze the camera shot and specifically, the function of the zoom technique, with caution, given the contradictory nature of previous research and the lack of significance found in this study.

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Appendix A

Definition of Terms

1. Cognitive style - "Individual variation in modes of remembering and thinking, or as distinctive ways of apprehending, storing, transforming, and utilizing information" (Kogan, 1971, p.246).
2. Field Dependent - An identified cognitive style which denotes a person's tendency to see stimuli as holistic or global and which involves the need for some external source of structure (Kogan, 1971, p. 246).
3. Field Independent - An identified cognitive style which denotes a person's tendency to experience items as discrete from their background and involves the ability to overcome the influence of an embedding context (Kogan, 1971, p. 246).
4. Generation - The use of processed stimuli to develop a solution to a problem with which a person is confronted.
5. Supplantation - Any device which acts as a bridge allowing a learner to perform a task which he could not otherwise perform. The supplantation device performs whatever stimulus transformation is demanded by the learning task.
6. Transformation - After perception, the changing of stimuli from their raw form into a processed form.
7. Zoom Technique - A supplantation device in which the television camera closes in on a specific part of the picture, beginning with a wide angle view and ending with a restricted, more specific view.

8. Medium Message Codes - Those attributes unique to each medium which the learner must understand in order to learn a given task presented by that medium.
9. Modeling - The ability of a subject to internalize a technique or process and to imitate it.
10. Internalization - A step in the modeling process wherein the subject reproduces, generalizes, and assimilates the process or technique into the general pattern of thinking, separate from the immediate task.
11. Imitation - A step in the modeling process where subjects replicate the technique or process at another time.

Appendix B

Directions for Completing GEFT

Distribute test booklets and pencils. As soon as the identifying information on the cover page has been filled in, the Examiner (E) says: "Now start reading the Directions, which include 2 practice problems for you to do. When you get to the end of the Directions on page 3, please stop. Do not go beyond Page 3." Proctors should circulate in the room making sure subjects are doing the two practice problems correctly and that they do not turn past Page 3.

When all subjects have finished reading the directions on Page 3, E says: "Before I give the signal to start, let me review the points to keep in mind." (Read the statements at the bottom of Page 3, stressing the necessity for tracing all lines of the Simple Form, including the inner lines of the cube, simple form "E," as well as for erasing all incorrect lines.)

"Are there any questions about the directions?" (E should pause to allow questions.) "Raise your hand if you need a new pencil during the test."

E then says: "When I give the signal, turn the page and start the First Section. You will have 2 minutes for the 7 problems in the First Section. Stop when you reach the end of this section. Go ahead!" This section is primarily for practice with the format of the test. Proctors should circulate and give additional explanations

to those who seem to be having difficulty with this set of practice items.

After 2 minutes E says: "STOP--Whether you have finished or not. When I give the signal, turn the page and start the Second Section. You will have 5 minutes for the 9 problems in the Second Section. You may not finish all of them, but work as quickly and accurately as you can. Raise your hand if you need a new pencil during the test. Ready, go ahead."

After 5 minutes E says: "STOP--Whether you have finished or not. When I give the signal, turn the page and start the Third Section. You will have 5 minutes for the 9 problems in the Third Section. Raise your hand if you need a new pencil during the test. Ready, go ahead."

After 5 minutes E says: "STOP--Whether you have finished or not. Please close your test booklets" (Witkin, et al., 1971).

Appendix C

Directions for Completing Treatments and Post Tests

A. Directions for viewing treatments A and B

Students, you are going to view a videotape with pictures. Pay attention to as many details as you can remember. You will be given a test after you view each picture, and you will be asked to recall details from the pictures which you have seen.

Are there any questions?

Ready? Let's begin the tape.

B. Directions for completing the post tests

Students, you have just seen the (first, second, third, fourth) picture. Now we want to see how many details you can remember from the picture that you have just seen.

Take out the answer sheet provided in your folder.

Notice that there are spaces for 50 answers, and you have choices A through E for each item. We are only going to complete items (1-10, 11-20, 21-30, 31-40) for this picture. I will show you a videotape with five details of pictures. One of these details you have just seen. Mark the letter representing the detail that you have seen on your answer sheet in the appropriate space.

For example, (show template representing location of test items on television screen), you will see five details which fill in the slots in this frame. One of the details you have just seen on the

videotape; the other four details were not on the videotape which you have just seen. Pick the detail which you remember seeing and mark it on your answer sheet. If you think the answer is A, mark A (point to A on the template). If you think the answer is B,C,D, or E, mark the letter in the appropriate spot on your answer sheet. Each frame is numbered from 1 through 40 and will appear in the bottom center of the television frame (point to location on template). Make sure that the number on your answer sheet corresponds to the number on the television screen.

Are there any questions?

In just a moment I will start a videotape with ten such question frames. Pick the correct answer (that is, the detail which you have just seen on the videotape) and mark the correct answer on your answer sheet.

Again, are there any questions? You will have ten seconds to look at the question and ten seconds to answer the question. Let's begin.

Appendix D Answer Sheet

	(1)	(2)	(3)	KEY	
1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E
41	A	B	C	D	E
42	A	B	C	D	E
43	A	B	C	D	E
44	A	B	C	D	E
45	A	B	C	D	E
46	A	B	C	D	E
47	A	B	C	D	E
48	A	B	C	D	E
49	A	B	C	D	E
50	A	B	C	D	E

FEED THIS DIRECTION

PART 1

USE #2 PENCIL

EXAMPLE: A B C D E

ERASE COMPLETELY TO CHANGE

NAME _____

SUBJECT _____

DATE _____

HOUR _____

511N-TRIN FORM 882

PART 1	
PART 2	
TOTAL	

TEST RECORD

Appendix E

No Zoom Treatment Pictures



Interior with a Girl Drawing

(The Center for Humanities, 1971)



Mandolin and Guitar



Night Fishing at Antibes

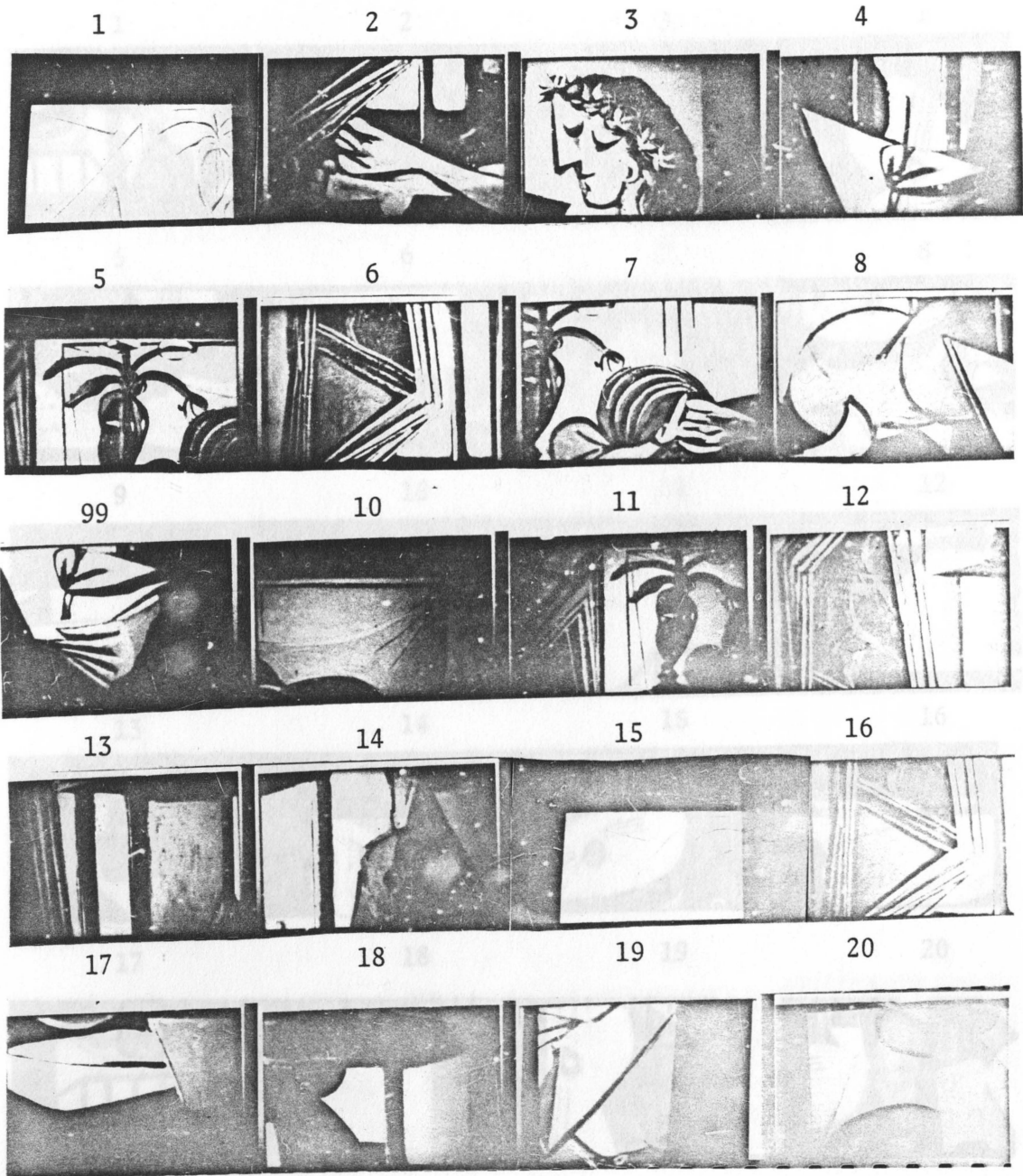


Bullfight

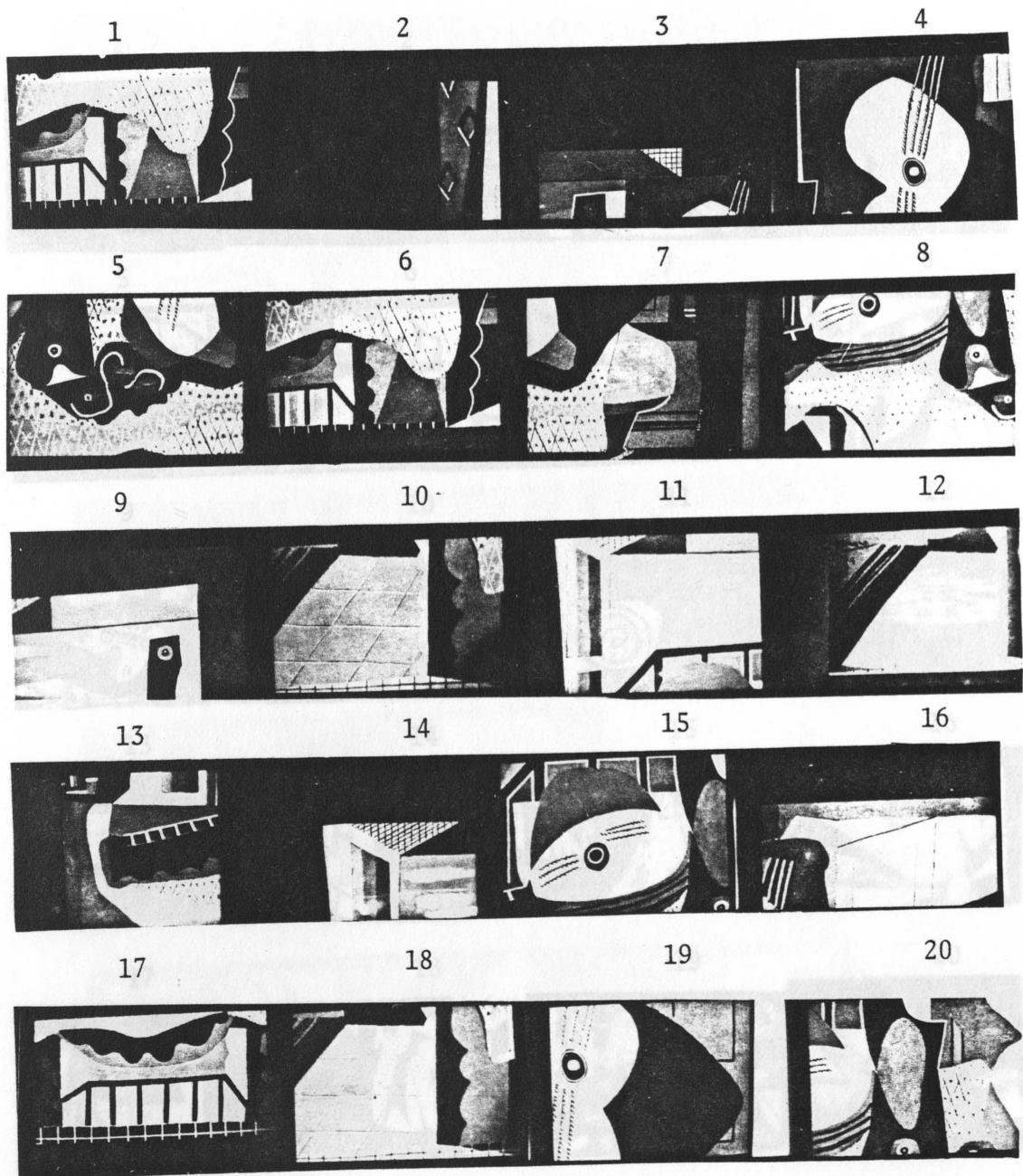
Appendix F

Zoom Treatment Pictures

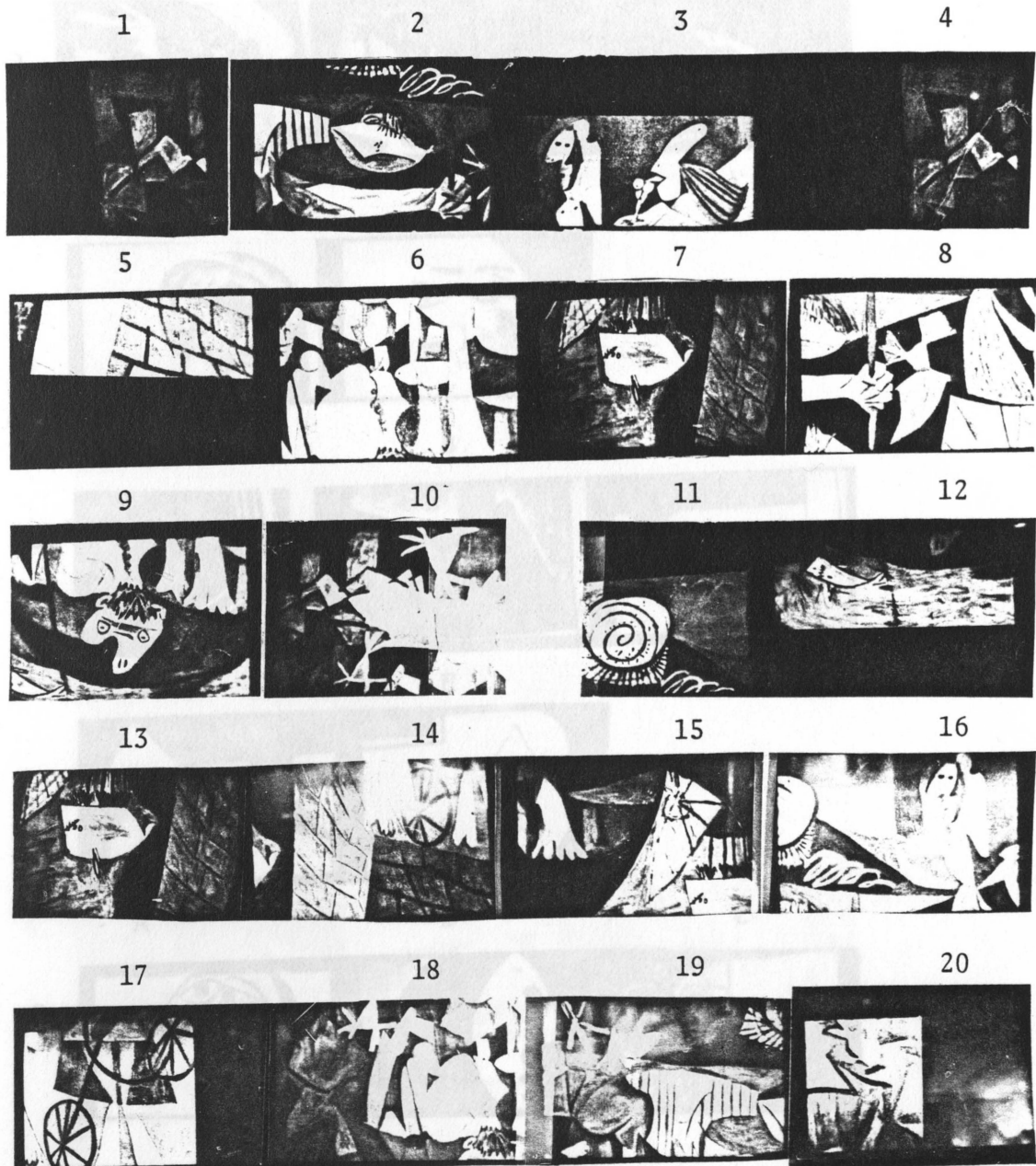
Picture 1: Interior with a Girl Drawing



Picture 2: Mandolin and Guitar

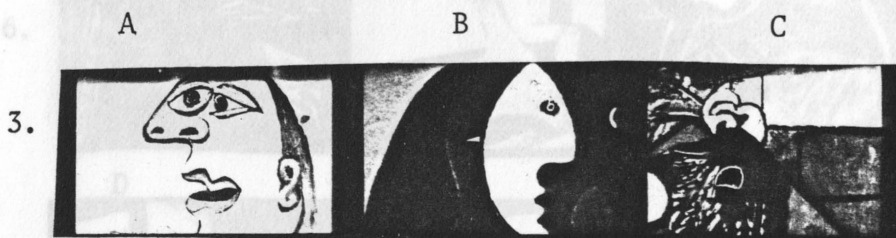
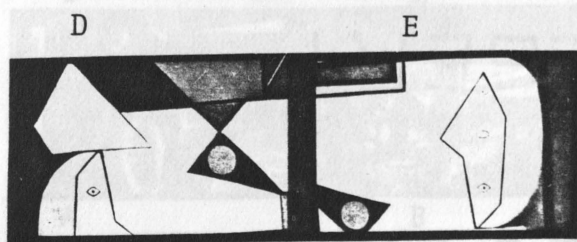
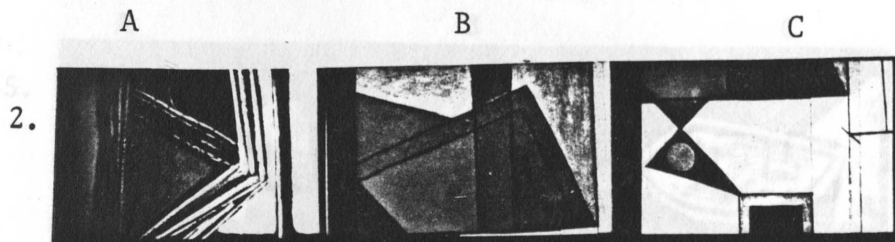
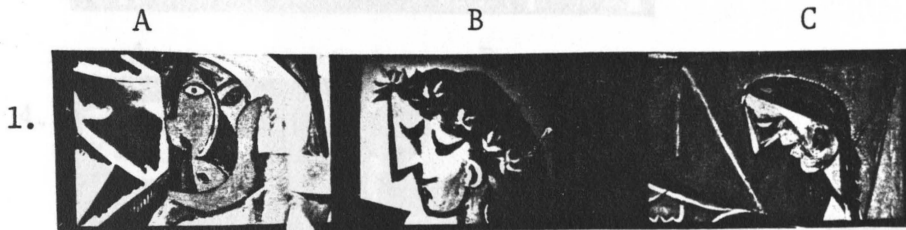


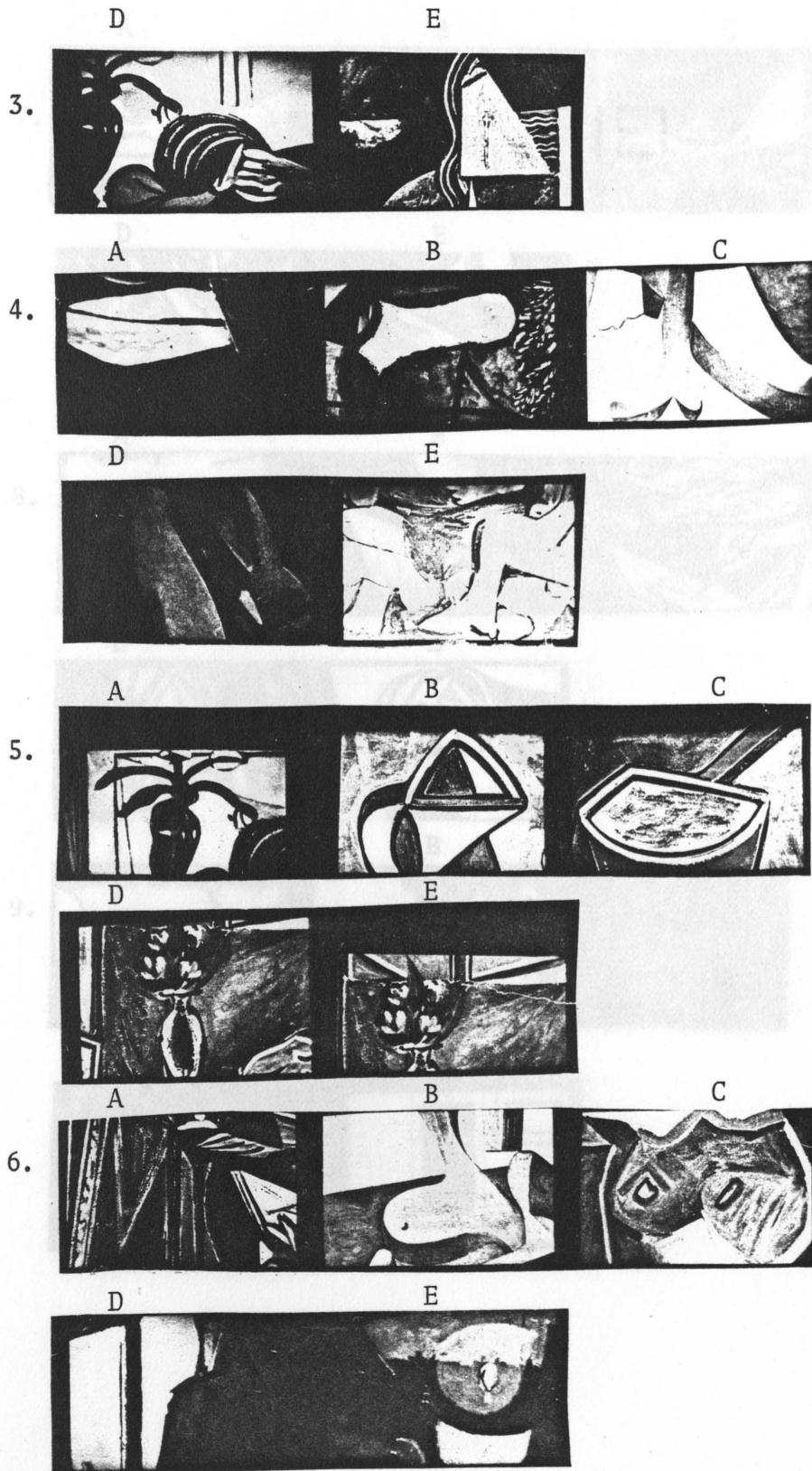
Picture 3: Night Fishing at Antibes

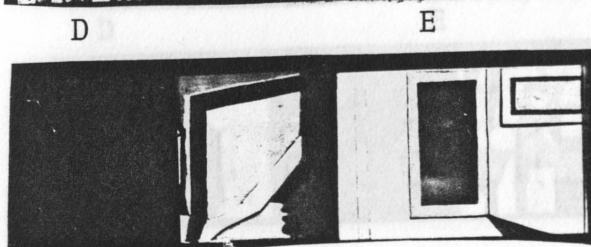
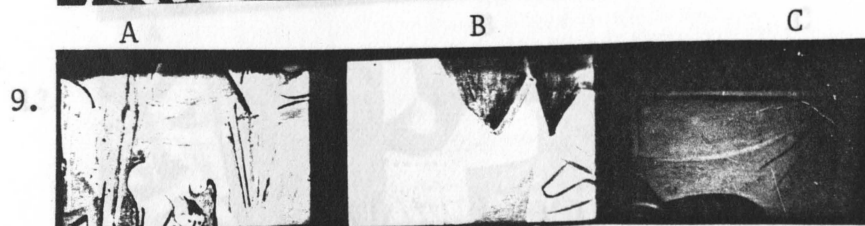
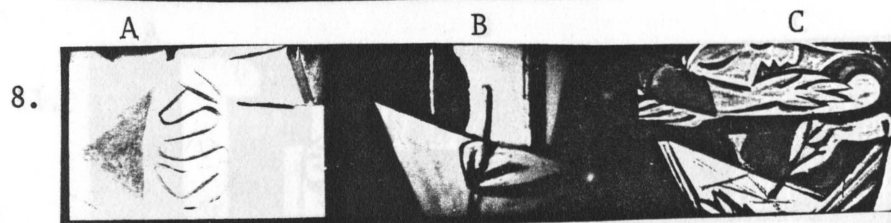
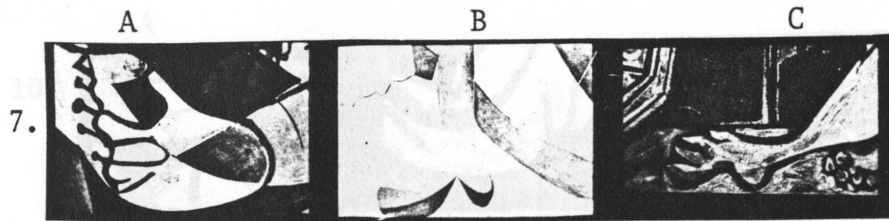


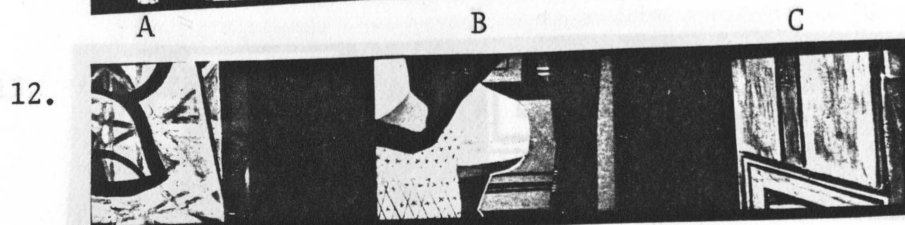
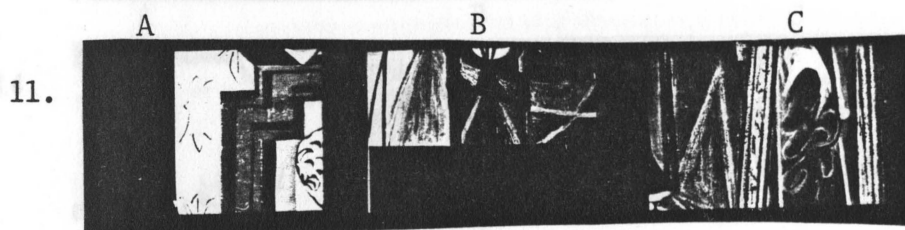
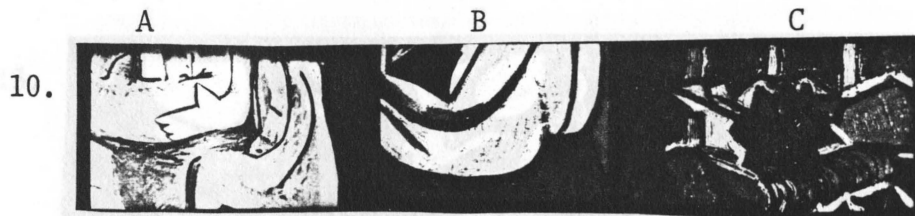
Appendix G

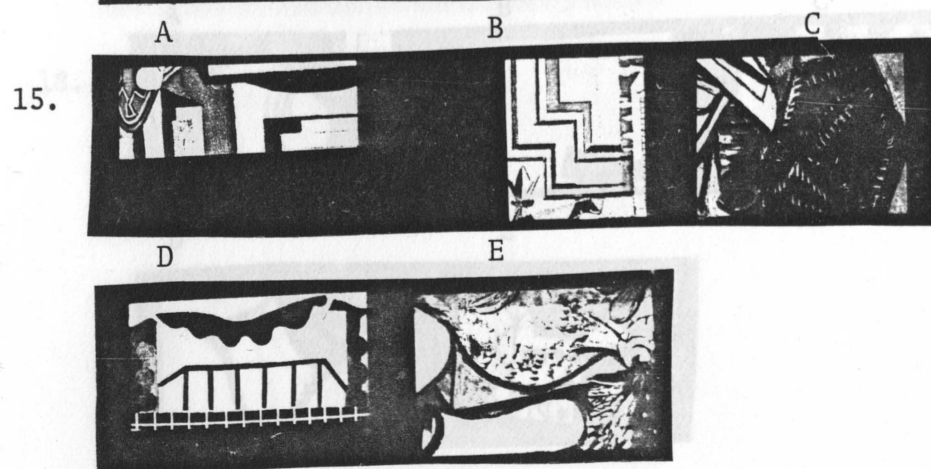
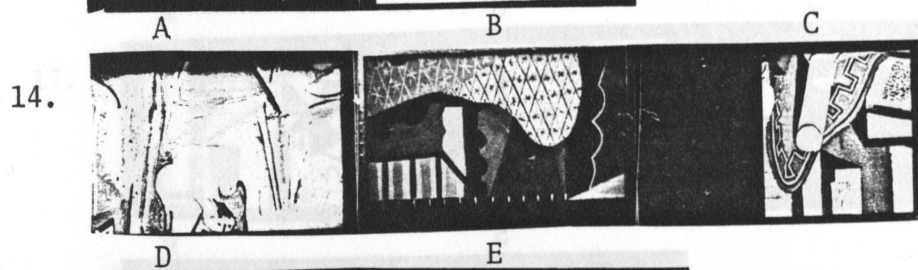
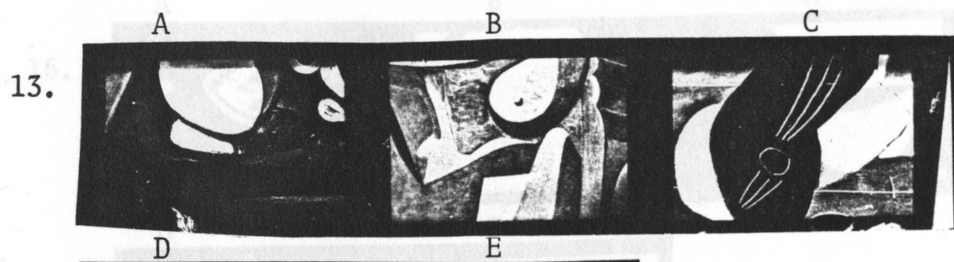
Posttest Items



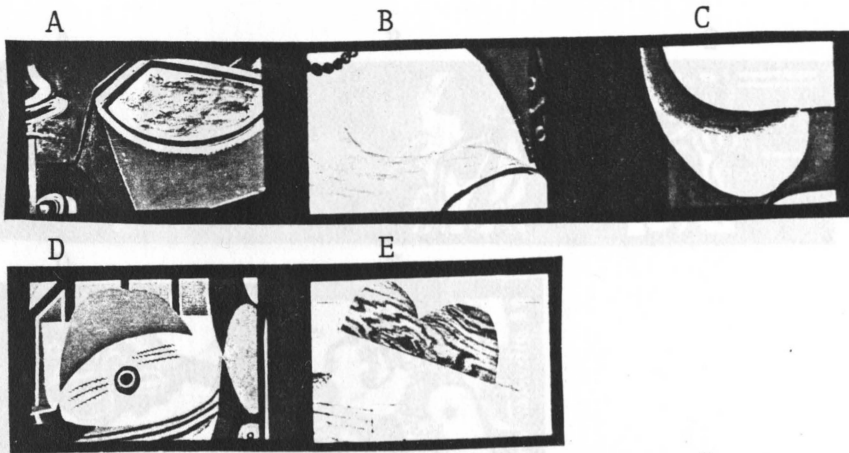




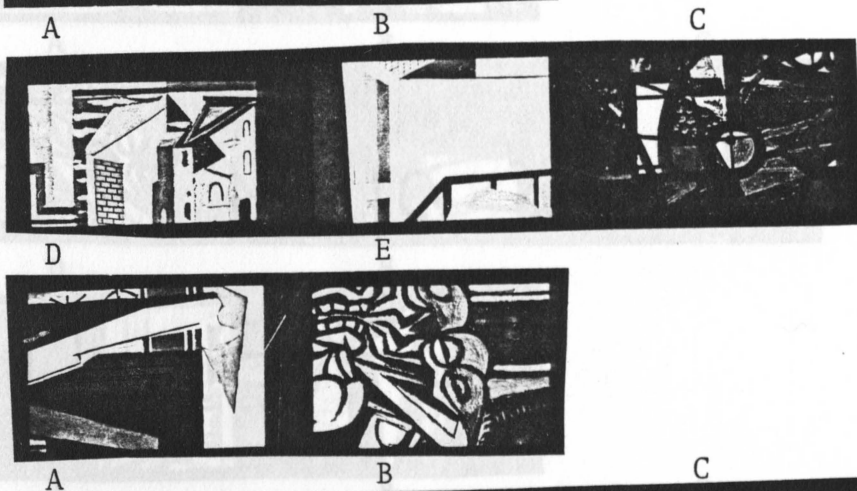




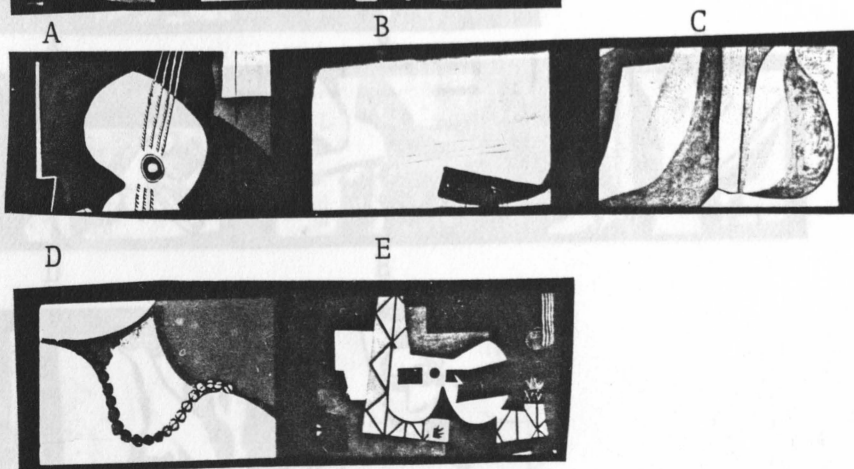
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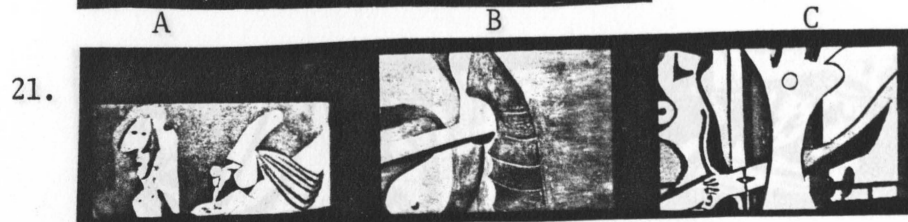
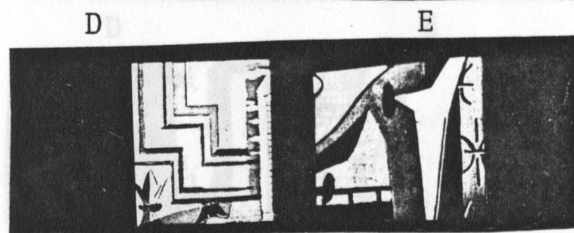
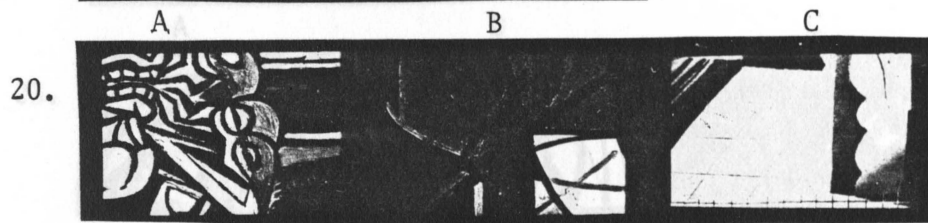
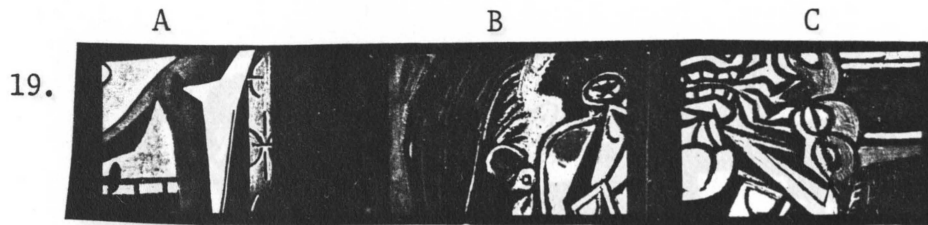


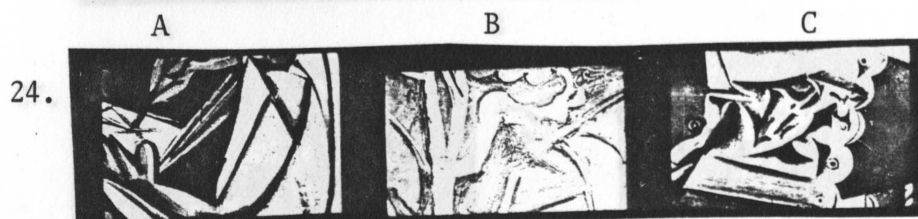
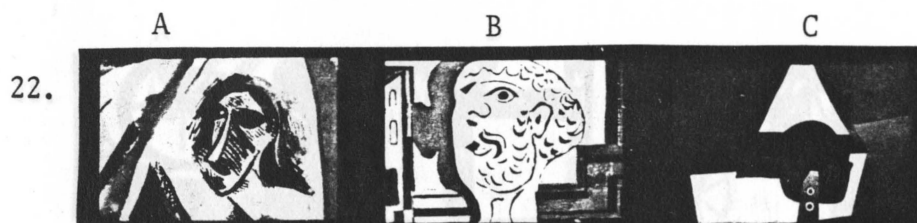
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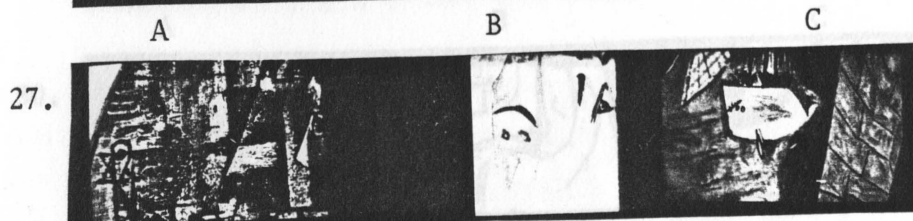
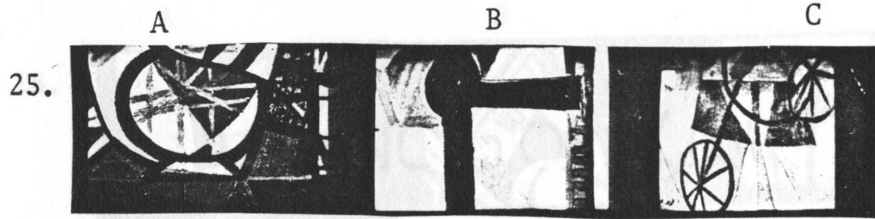


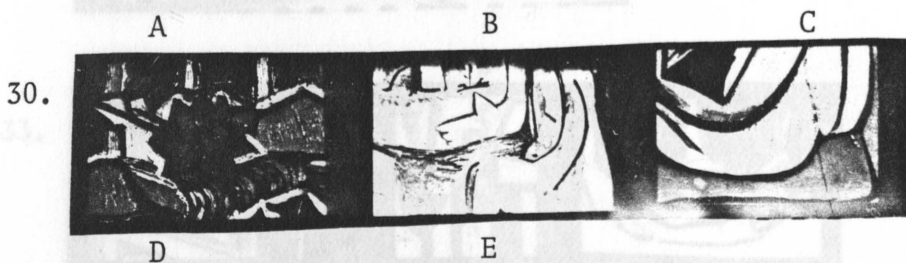
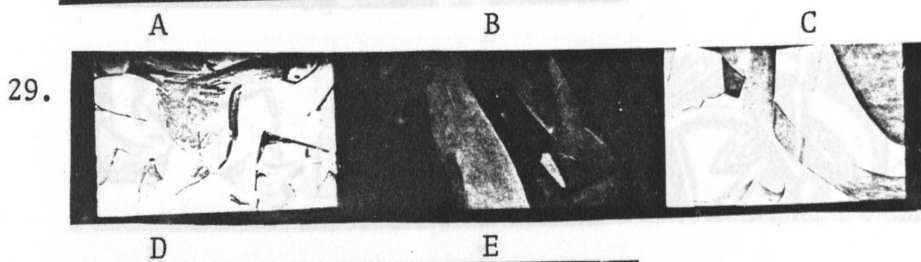
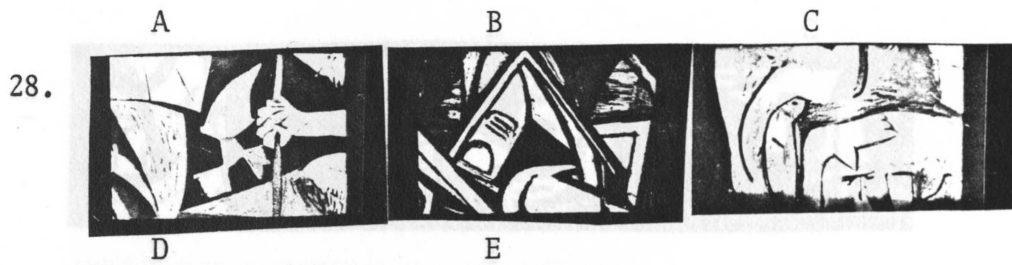
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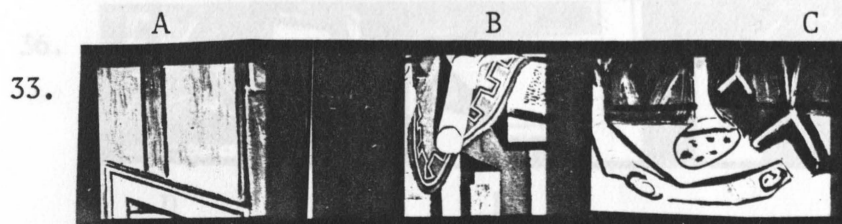
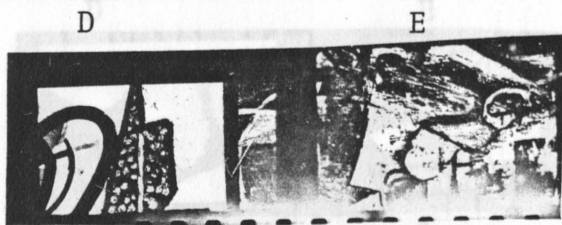
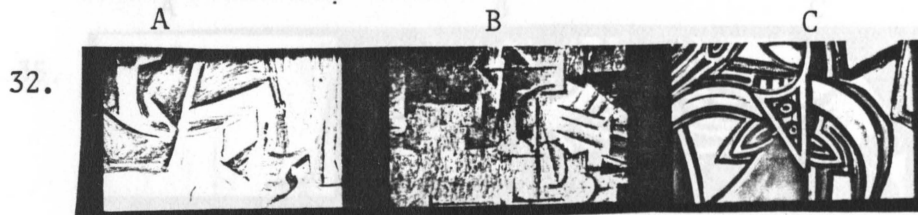
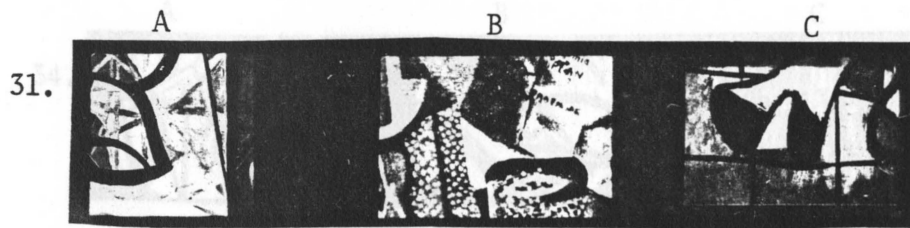


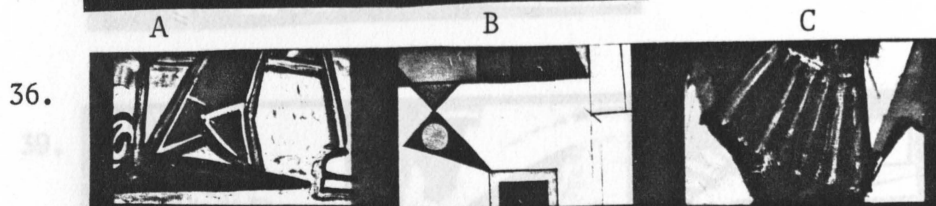
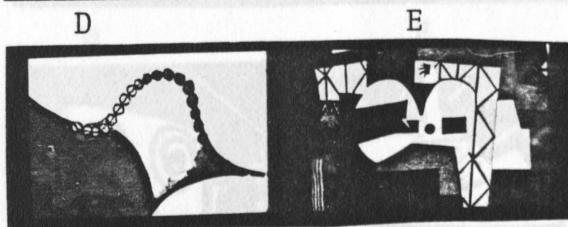
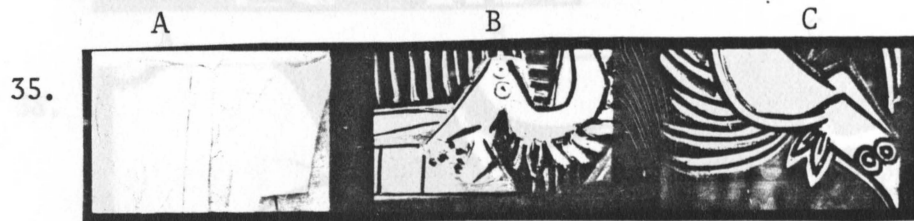
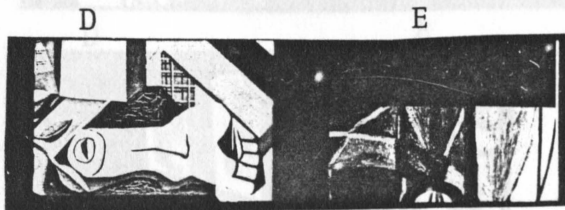
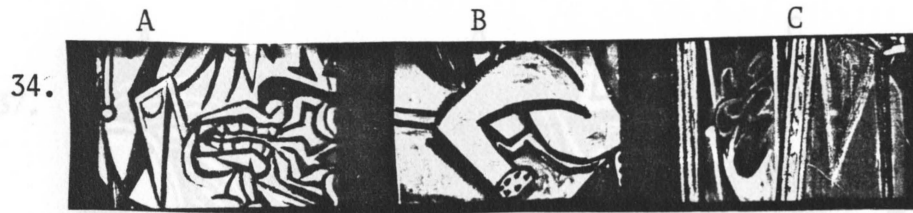


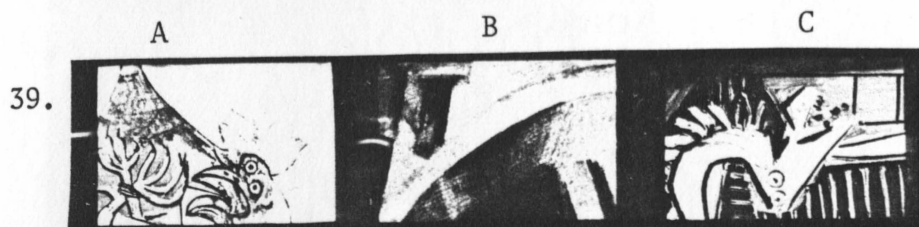
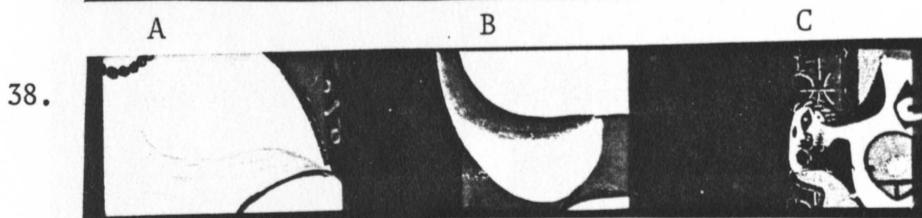
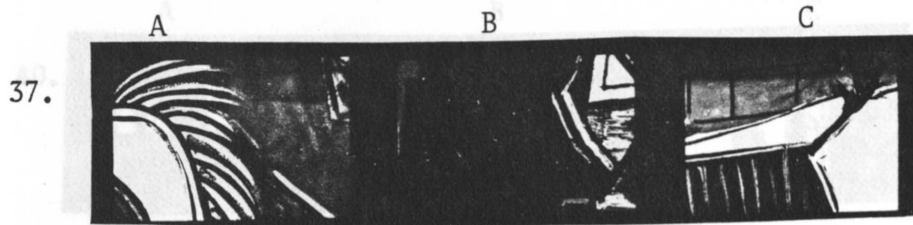


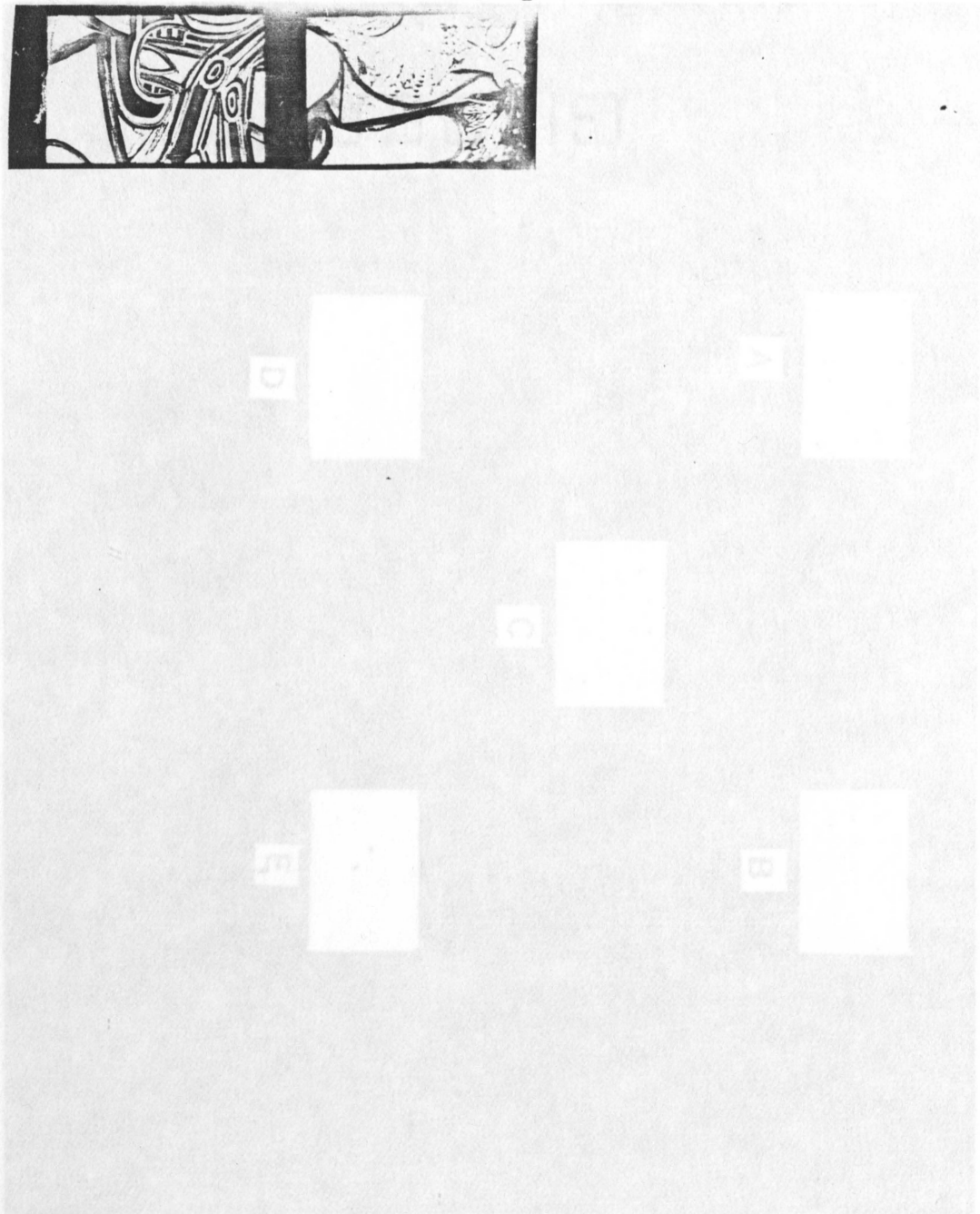
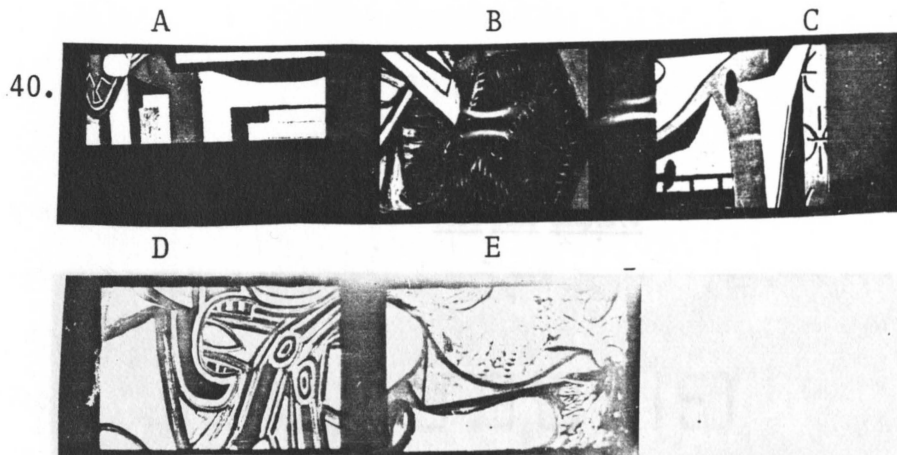


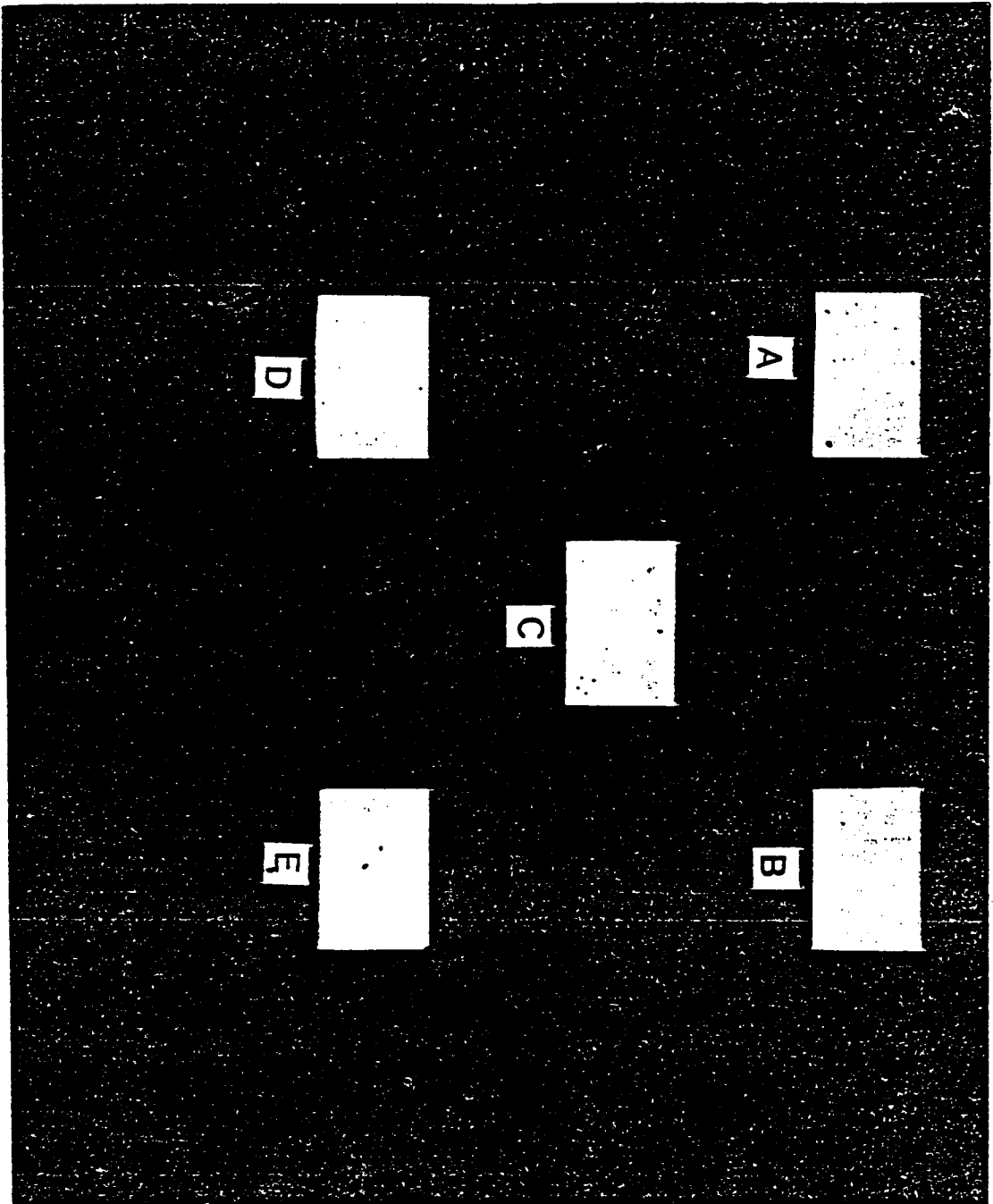










Post test template

Appendix H

Demographic Data

I. Group Embedded Figures Test Scores

Raw scores	N	percent
0-3	17	14
4-6	28	24
7-9	23	19
10-12	19	16
13-15	20	17
16-18	12	10

II. Treatment

Treatment	N	percent
Zoom	68	57
No zoom	51	43

III. Sex

Sex	N	percent
Male	43	36
Female	76	64

IV. Age

Age	N	percent
17-20	64	54
21-24	10	8
25-32	29	24
33-40	12	10
41-63	4	4
	N=119	100

**The vita has been removed from
the scanned document**