THE EFFECTS OF DESCRIPTIVE SOCIAL REINFORCEMENT ON CREATIVE RESPONSES IN CHILDREN'S DRAWING

by

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ABSTRACT

This study extends previous work in the use of descriptive reinforcement procedures with tempera painting (Kratochwill, Rush, and Kratochwill, 1979) to increase productivity of new forms in children's drawings. Four out of five kindergarten children judged by their teachers to exhibit relatively low creativity in drawing received descriptive reinforcement contingent upon the appearance of new forms in their drawings. It was observed that the drawing forms displayed by kindergarten children, unlike their painting forms, were already schematic at the beginning of the study. This factor reduced the frequency of new forms, thus providing fewer opportunities for reinforcement than occurred in Kratochwill et al. with painting forms. Despite less frequent reinforcement, the diversity of the children's drawing forms did increase during experimental treatment. All of the experimental children subsequently were judged by art teachers to have more creative drawings than their classmates, indicating that the teachers regarded form diversity as a major component of creative responses in children's art.

CHAPTER 1

INTRODUCTION

This study applied descriptive reinforcement procedures used by Kratochwill, Rush, and Kratochwill (1979) to enhance creative responses in children's drawings. Kratochwill et al. employed descriptive reinforcement with children's easel painting, replicating Goetz and Salmonson (1972) who had demonstrated that they could increase the number of painting forms used by children in this fashion. In the present study, descriptive reinforcement also increased the number of forms in children's drawing.

Those who train and educate children are involved in the ongoing process of enhancing or changing behaviors. In other fields of education, reinforcement practices have been employed to encourage and socially reward children. Their concern has been to modify a range of social and cognitive behaviors, from working with retarded children to reshaping children's writing skills.

Within art education, studies involving reinforcement as a variable for enhancing creativity have been scarce. Only recently have art education researchers incorporated reinforcement practices in an attempt to modify and enhance certain behavioral

components of creativity in the visual arts. This may be due to controversy among educators as to the meaning of creativity. Creativity has been defined as novel behaviors, as the employment of unique, original and inventive forms. For the most part, creativity has been measured by the observation of traits existing in some children while lacking in others. It is only recently that studies have devised strategies to improve, increase, and enhance these observable traits that have been labeled creative.

All of the recent studies using descriptive reinforcement with young children have examined their painting forms. Questions have remained as to the effect of reinforcement contingencies applied to drawing because it is a graphic technique learned earlier, and at which kindergarten children are therefore more adept than they are at painting. The present study attempted to enhance the diversity of kindergarteners' drawing forms, hypothesizing that the use of descriptive reinforcement would be effective and that the resulting form diversity would cause the children's teachers to judge those drawings as artistically creative.

This study was conducted at the same Tucson public elementary school as that of Kratochwill et al. (1979) with children of the same age group. In keeping with the procedures of Kratochwill et al., this study employed criteria created by Goetz and Salmonson (1972) to identify new forms. Some revisions of the criteria of Goetz and Salmonson were made so that they would

apply to forms of representation found in drawing when they diverged from those found in painting. A baseline of forms was initially taken for five subjects by asking them to draw a series of four to seven pictures. Once the baseline was determined, a program of social reinforcement was begun and numbers of new forms subsequently appearing were recorded.

CHAPTER 2

LITERATURE REVIEW

Creativity

Creativity is valued highly by some educators and parents. There are different notions of what constitutes creative behavior. All studies involved with creativity have the problem of defining creative behaviors. Attempts to define the attributes associated with creativity have occurred not only in the visual arts but also with regard to verbal skills and in the sciences. Because creativity overlaps other fields of knowledge, and it is valued within the educational system, many studies are concerned exclusively with defining creativity.

Stein (1953) defined creative work as novel work that can be useful or satisfying. He discussed creativity as a reintegration of already existing materials or knowledge. Maltzman (1960) defined creativity as the product of originality, the consequence of an original behavior. With regard to writing skills, creativity has been regarded as inherent, presumed to flow automatically from the writer. Brigham, Graubard, and Stans (1972, p. 429) summed up this idea of creativity by stating that teachers "believe there is a reservoir of creativity within children and if

left alone, originality and wonderful stories will emerge." This idea of creativity can also be found in the visual arts.

Most educators agree that a complete definition of creativity may be impossible to arrive at due to the term itself. Even though this is the case, researchers continue to define observable creative traits. Getzel and Jackson (1963) and Newmeyer (1972) studied family influences that facilitate or hamper creativity. Barron (1955) and Dillehunt (1973) examined the interrelated aspects of creativity and the personality. Other studies have related creativity to intelligence factors (Mussen, Conger, and Kagan, 1974; Wallach and Kogan, 1965).

Depending on the definitions of creativity, a variety of procedures could be developed to train and assist those behaviors. Regardless of the definitions of creativity, the basic problem associated with these studies is in trying to facilitate originality, and the frequency of its occurrence rate. According to Maltzman et al. (1960), occurrence of originality may appear at infrequent intervals or not at all. The problem in training originality (creativity) is to devise methods for increasing its frequency of occurrence.

Assuming originality can be learned, the same principles of conditioning should be as effective as other forms of operant behaviors. Glover and Gary (1976) showed that the frequency of creative responses could be increased by reinforcing creative responses during classroom activities with procedures which combined instruction, reinforcement, and practice. Other studies

(Carter, Richmond, and Bundschuh, 1973; Reese and Parnes, 1970; Zimmerman and Dialessi, 1973) evaluated the effect of programming creative problem solving by measuring the children's responses with the Torrance Product Improvement Test or the Torrance Creativity Test.

Behavioral researchers have emphasized the external environmental factors which can be used to enhance behaviors. Up until now, art educators' attitudes toward creativity have been visible in the emphasis they have placed on teaching how to use art media in the classroom setting. Only recently have attempts been made to define observable characteristics of children's creativity and to apply descriptive reinforcement procedures to these creative responses to enhance the quality of forms produced (Goetz and Salmon, 1972; Kratochwill et al., 1979).

Reinforcement

Positive reinforcement as an educational device for altering behaviors has been the topic of a wide range of studies. Behavioral psychologists have studied the principle of positive reinforcement in detail since the 1930's and believe it to be the single most important part of the learning process. Social reinforcers such as praise and rewards exert considerable control over behaviors. Since the control of behaviors (whether enhancing or changing behaviors) is the concern of those individuals responsible for training and educating children, it is crucial

for these educators to consider reinforcement as a strategy for behavior modification.

Glover and Sautter (1976) demonstrated that reinforcement played a crucial role in the acquisition and development of both simple and complex behaviors. The principle of positive reinforcement is twofold. If a behavior is displayed that is followed by a desired consequence, that behavioral response is more likely to be displayed again in a similar situation. The consequence of the act is the positive reinforcer.

Pear (1978) discussed two factors involved when using reinforcement variables to alter behaviors, which he believed to influence the effectiveness of reinforcement contingencies. The first was the selection of the behavior to be increased. Glover and Sautter (1976) agreed with Pear in the importance of behavior selection, stating that reinforcement needed to be perceived by the subject as contingent upon his or her behavior. "The fact that persons perceive reinforcement as contingent upon their own behavior may well increase the probabilities of their learning those new and unique modes of responding that are characteristic of creative individuals" (Glover and Sautter, 1976, p. 260).

The second factor that Pear believed influenced the application of reinforcement was choosing the proper reinforcer to be administered as the consequence of the behavior displayed. These positive reinforcers can be contingent on five applied reinforcing variables: consumable, activity, manipulative, possessional, or social reinforcers. Consumable reinforcers are

food and candy. Activity reinforcers are rewards such as TV viewing, reading, and movies. Manipulative reinforcers are opportunities to play with various toys. Possessional reinforcers are opportunities to enjoy an item one can possess, i.e., a new sweater. Social reinforcers are "praise, activities and privileges . . . [,] types of reinforcers [that] can be used in virtually any setting" (Kazdin, 1980, p. 148).

Reinforcement practices have been employed to encourage and socially reward children. Its practice has included all aspects of behavior modification, from working with retarded children, to reshaping children's writing skills, to the enhancement of creative abilities. There is a common belief that complex behaviors may be synthesized by applying specific reinforcement contingencies to various aspects of the children's behaviors (Brigham, et al., 1972). Their study examined the effect of reinforcement contingencies when applied to specified variables of composition. They attempted an alternative form of shaping to improve current behaviors, producing more complex behaviors in composition writing.

Glover and Gary (1976) also studied the modification of behavior components with regard to four behaviorally defined creative behaviors of elementary students. Their study demonstrated that procedures which combine instruction, reinforcement, and practice were useful and powerful in changing behaviors. Glover and Gary (1976, p. 84) suggested that the implementation of these reinforcement procedures could be adopted for classroom

use by teachers to "increase levels of creativity . . . in writing, problem solving and other activities in which fluency, flexibility, elaboration and originality can be identified."

Maloney and Hopkins (1973) demonstrated that children's writing abilities increased through reinforcement and modification of sentence structures. They demonstrated the efficacy of enhancing levels of creativity by reinforcing creative responses during classroom activities. Their study dealt with modifying the sentence structure and the usage of speech parts in stories written by fourth, fifth and sixth graders. They applied subjective judgments of creativity to the operationally defined variables chosen for manipulation. Reward (points redeemable for candy and extra recess) were given based on the occurrence of different adjectives, different action verbs, and different sentence beginnings. Maloney and Hopkins found that a variety of responses could be increased from baseline to treatment sessions.

Other studies (Clair and Snyder, 1979; Fagot, 1973; Hamilton and Gordon, 1978; Woolfolk, 1978) have explored the effects of teachers' behaviors as reinforcing variables in themselves. All concerned the relationship of the teacher to the child and the effects of the entire evaluation and grading process. It is evident from these studies that there is a direct correlation between the student's motivational behavior and those behaviors displayed by the teachers.

Hamilton and Gordon (1978) hypothesized in their study that teacher criticism and interference would be associated with

low task behaviors in children. They further hypothesized that children who received more frequent praise would show greater in-class involvement and would be more persistent on the experimental task. Their study successfully displayed the effects of the experimentors' behaviors toward the child. Teacher criticism inhibited task behaviors, but their study revealed that the effects of the teacher, as a reinforcing variable, was a more potent reinforcer than rewards like praise and attention.

Clair and Snyder (1979, p. 56) showed that "instructors may lessen the debilitating effects of negative evaluative feedback by communicating positive expectations." Their study also showed a correlation between the teacher's expectation of the students' performance level and the resulting behavior. Clair and Snyder sought to explore the repercussions of instructors giving students evaluative feedback. The evaluative feedback given in this study to four groups of college students was uniformly positive, uniformly negative, negative to positive, or positive to negative. An important factor that influenced performance was the students' motivational state following the instructor's evaluation. Those students expected to do well consequently felt better about their performance and also expected to do well. These students were highly motivated as a result of high expectations.

Woolfolk (1978) also found that positive verbal evaluation from the teacher was related to the student's achievement. The effects of four combinations of teacher verbal and nonverbal

evaluative behavior were studied on sixth graders. These verbal and nonverbal behaviors were coupled with positive and negative behaviors. Woolfold stressed the importance of a teacher's nonverbal dimensions as displayed in body language. The result of her study revealed that the most effective teacher was the negative nonverbal with positive words, that is, words that are supportive complemented with a nonverbal demeanor that communicates seriousness and control.

Fagot (1973) found that good teachers were more involved, more approval orientated. Teachers who were more controlling and negative with their feedback were found to be less affective. Classes with the less directive, less critical teachers showed a higher rate of children's task behavior. Children with teachers that were highly controlling were less motivated to achieve. These studies have concerned themselves with classifying teacher's behaviors and suggest that many students learn more in an atmosphere free of criticism and open to student inquiry.

Denton (1978) extended the use of reinforcement practices as a strategy for modifying both social and cognitive behaviors. Denton found that the principles used to teach academic skills are the same principles used to teach acceptable social behaviors. His study revealed that both can be taught with an instructional system based on reinforcement. Denton stressed the importance for the teacher to structure external conditions (the

environment of the classroom) so that the students would seek structured rewards of praise, points, or grades.

Reinforcement and Creativity

Researchers have only recently incorporated reinforcement practices in an attempt to modify and enhance certain behavioral components that could pertain to creativity in the visual arts (Goetz and Baer, 1971, 1973; Goetz and Salmonson, 1972; Holman, Goetz, and Baer, 1977; Kratochwill et al., 1979). Goetz and Baer (1971, 1973) applied descriptive reinforcement to children's creative behavior contingent upon block building forms not previously observed. They demonstrated that creative responses could be enhanced in preschool children with block building tasks. Three preschool girls found to contain a low number of forms in their block building constructions received social reinforcement contingent on new form production. Goetz and Baer defined 20 forms common in block building. The children were invited to play and create with the blocks. Verbal reinforcement was employed with every new form created within the current sessions. The goal of their study was to foster creativity through direct training. Their study demonstrated the effectiveness of reinforcing objectively specified aspects of children's block building so that the resulting forms could be noted as being diverse and creative.

Holman et al. (1977) conducted two experiments to extend the research of Goetz and Baer. The first experiment reinforced

first appearances of new forms in easel paintings. The second experiment compared concurrent baselines on child behaviors in drawings, easel paintings, block building, and legoblock constructions. The experimental procedures used increased form diversity and the occurrence of new forms in all of these creative responses and revealed the influence of the environment regardless of children's art media.

Goetz and Salmonson (1972) demonstrated that the number of painting forms displayed by young children could be increased through the use of descriptive reinforcement. Three preschool children who displayed low form diversity within their paintings participated in this study. The teacher employed descriptive reinforcement procedures when new forms were displayed. Through the application of teacher-administered reinforcement procedures, the children's paintings increased in form diversity.

Kratochwill et al. (1979) used the procedures of Goetz and Salmonson (1972) with four kindergarten children enrolled in a school where art was part of the curriculum. Their systematic replication found that descriptive reinforcement dramatically increased the number of new forms used by these five-year-old children in their paintings. Children initially judged as less adept at painting than their peers were judged as artistically advanced after a few weeks of reinforcement. These children in all cases moved from making preschematic to schematic configurations in their painted artworks. These studies all demonstrated that

reinforcement procedures altered artistic behaviors and enhanced creative graphic responses.

CHAPTER 3

METHOD

Setting

This study took place at a Tucson public elementary school. Five kindergarten children, separated from each other and from their other classmates, participated in an average of 15 sessions of drawings monitored by the experimenter, an art education graduate student. The duration of each session was determined by the amount of time the child was engaged in the drawing activity. The children met with the experimenter twice a week during school hours at times when they were attending a regularly scheduled class.

Subjects

Subjects were five kindergarten children, three boys and two girls. All were selected from the same age group, same upper middle class socioeconomic level, and same Tucson public elementary school as the children in Kratochwill et al. (1979). Three classroom teachers chose the five subjects from a group of 16 classmates because they demonstrated a relatively low level of creativity in their drawings as compared with their peers.

Procedures

Definitions of Drawing Behaviors

Drawing behaviors displayed by the children were defined according to 24 painting forms adapted from those identified by Goetz and Salmonson (1972) and used by Kratochwill et al. (1979). Some of the criteria were modified so that they would apply to drawing forms (see Table 1).

Scoring

A form diversity score was defined as the total number of criterion forms appearing once in drawings from any given session.

A new forms score was defined as any of the 24 criterion forms appearing in a drawing from a given session that had not previously appeared in any of that child's drawings during past sessions. All forms appearing in the first session were considered new and the total number comprised the child's baseline of forms. All additional new forms (those other than forms counted as baseline forms) that subsequently appeared in the following sessions were counted toward the new forms score.

Two observers (both art teachers) independently rated each child's drawing for each session by counting the number of criterion forms that appeared in drawings from each session. A measure of interobserver agreement for form diversity was obtained by summing the number of forms observed per session by each rater for each child, dividing the lower number of

Table 1. Operational Definitions of Drawing Forms*

No.	Definition
1.	SHADING METHODS--areas of darkness by crosshatching, clumping dots, solid areas of darkness.
2.	CIRCULAR--any nearly enclosed curve such as circles, ovals, ellipses, etc.
3.	CURVE--a line or any part of a line, at least three inches long, continuously bent so that no portion of it is straight.
4.	DIAGONAL LINE--a relatively straight line, at least three inches long, forming a 10-80 angle.
5.	DUPLICATE FORM--a relatively exact pair of any abstract form, clearly seen as a design, or any of the starred (*) forms: The size and tonal variation may vary but not the structure. It should be basically the same. Simple forms, such as circles, require more exactness than more complex forms, such as an irregular enclosure or simulation. A staccato grouping itself is not a duplicate. The same grouping must be repeated in another area of the paper.
6.	HORIZONTAL LINE--a relatively straight line, at least three inches long, forming a 0-10 angle.
7.*	IRREGULAR ENCLOSURE--any closed or nearly closed unsymmetrical line formation.
8.*	LAYERED--three or more repeated lines using different pressures resulting in varied tones, one inch or less in width, which lie side by side. Each line should be a different tone.
9.	MASS--any solid area of darkness at least two inches long and two inches wide.
10.	OVERLAPPING SAME FORMS--a duplicate with one form extending over and covering a part of the other.
11.	PATTERN--same as a duplicate, only requires three or more copies.
12.*	RECTANGULAR--any nearly enclosed form with four relatively straight sides and four 90 degree angles, approximately within 10. Opposite sides must be relatively parallel.

Table 1--Continued

No.	Definition
13.*	SIMULATION--a construction which resembles a real life object. Symbols, such as letters and numbers, are not simulations.
14.	SPIRAL--a winding or coiled line; whether consisting of a continuous curve or straight lines. There must be at least two complete revolutions.
15.	SPACE USAGE--using the paper to suggest the form with positive and negative space.
16.*	SYMBOL--something other than a simulation which stands for something else, such as signs, letters, and numbers.
17.*	TINKER TOY LINE--circular forms with one or more straight lines connecting them.
18.*	TRAIN OF TONES--a series (three or more) of tones forming a line of procession.
19.*	TRIANGULAR--any closed or nearly enclosed form with only three sides and three angles. The inside lengths of at least two (2) sides must be at least one and one-half inches.
20.	TRICKLE--a flowing or falling stroke.
21.	UNDULATING LINE--a line with three or more curves approximately one inch or greater in depth.
22.	VERTICAL LINE--a relatively straight line, at least three inches long, forming an 80-100 angle.
23.	X-SHAPE OR CROSS--two interesting straight lines of linear proportions not greater than two-to-one (2:1). The two portions of an intersected line must be in proportions no greater than two-to-one (2:1) also. (1) If the lines are of relatively equal length, the angle of intersection is arbitrary, but the lines must intersect at relatively the same point on each line. (2) If the lines are not equal length, the angle of intersection must be relatively close to 90 (+ or -10).

Table 1--Continued

No.	Definition
24.	ZIG-ZAG LINE--a line or any part of a line with three or more angles formed by turning first to one side and then to the other.

*The Operational Definitions of Drawing Forms listed here are modifications of Goetz and Salmonson (1972) criteria of Operational Definitions with Painting Forms. The starred forms (*) pertain to No. 5, Duplicate Form.

observations by the higher number, and multiplying the dividend by 100 to obtain a percentage-of-agreement score for each experimental subject. All scores ranged from 85 to 100%, revealing a high level of interobserver agreement over baseline and treatment phases of the experiment (see Table 2).

Interobserver agreement on new forms was computed similarly by counting the number of new forms observed in each session for each child, dividing the lower number of observations by the higher number, and multiplying by 100 to obtain the percentage of interobserver agreement. The level of agreement on the appearance of new forms between the two observers during baseline and treatment ranged from 87 to 100% (see Table 3).

Session Length

The duration of any session was determined by the amount of time each child was engaged in drawing. Each session was timed with a stopwatch, and the length recorded. Timing, scoring, and reinforcement, when used, began at the child's first mark on the paper and ended when the child remarked that he or she had completed the task.

Teacher Behaviors

The experimenter was periodically evaluated by an art teacher-observer to assess the experimenter's behavior with regard to the observed behavior of the children, i.e., the descriptive nature of the experimenter's comments and her efficiency in carrying out the experimental procedure. The observer was

Table 2. Form Diversity Reliability Scores on Frequency Data for Each Subject by Experimental Phase

Subject	Reliability Scores	
	Baseline %	Treatment %
Melissa	85	97
Mia	90	97
Chad	100	94
Alex	93	98
Andy (Control)	97	100

Table 3. New Forms Reliability Scores on Frequency Data for Each Subject by Experimental Phase

Subject	Reliability Scores	
	Baseline %	Treatment %
Melissa	100	95
Mia	88	90
Chad	95	87
Alex	93	93
Andy (Control)	92	90

familiar with the drawing criteria and kept independent records of the children's forms for drawing sessions.

Materials

The experimenter provided 18 x 24 paper and felt tip markers for each session throughout the study.

Experimental Sessions

Multiple baseline and treatments were employed with five children, four who received descriptive reinforcement and one control child who received none. The researcher exposed each child to the experimental treatment after the initial baseline of non-reinforced behaviors had been established. The no-treatment control child was monitored throughout the study.

Baseline No Reinforcement. During the initial baseline sessions, the experimenter sat quietly as the child drew. She made no comments until the drawing task was completed and the time was taken. The experimenter then expressed her thanks and appreciation to the child for the drawing. "What a nice drawing; thank you." The child then returned to his or her class. Baseline sessions continued until inspection of each child's daily form diversity scores showed a stable enough level to justify introduction of the experimental procedures.

Reinforcement of Forms. Once the children showed a stable level with regard to their form diversity scores, the experimenter began systematic descriptive reinforcement of the new forms that appeared. During the drawing sessions the

experimenter remarked with interest, enthusiasm, and delight every time a new form (one that had not previously appeared in that session) appeared. Any form that reappeared in a subsequent session, even if it had been reinforced in a previous session, was again reinforced. The only forms not reinforced were those that reappeared within the same session. The content of the experimenter's reinforcing remarks were designed to be descriptive, that is, they indicated the dimensions to be reinforced: "Very nice crossing lines. Look at those interlocking circles."

Social Validation. To obtain a measure of social validation with regard to characteristics of creativity, two art teachers unfamiliar with the design and hypotheses of the study rated four drawings of each child from both baseline and treatment sessions according to a five-point rating scale on which four was considered extremely creative and zero was considered noncreative. The teachers viewed drawings in random order and were unaware of which ones reflected baseline and which reflected treatment procedures. The art teachers also used this five-point rating scale to compare the art productions of four age-group peers of children in the experiment to art productions produced by our four treatment children during the reinforcement sessions.

Follow-Up. A follow-up session was conducted four weeks after completion of the study. Each child again drew without reinforcement. These drawings served to assess whether there was any diminishing of children's form diversity over time.

CHAPTER 4

RESULTS

Form Diversity

Figure 1 graphs the mean number of total criterion forms observed by the two raters for each child that appeared once in any given session. Form diversity scores for all of the reinforced children rose above those recorded for baseline sessions after treatment began, that is, reinforced children displayed greater numbers of new forms during their treatment sessions than during their baseline sessions. Child 1 demonstrated an average of 9.91 forms during baseline sessions and 11.6 during treatment. Child 2 displayed an average of 11.4 baseline forms and 12.4 treatment forms. Child 3 drew 13.0 forms during baseline and 13.5 forms during treatment. Child 4 demonstrated 8.28 forms during baseline and 9.45 forms for treatment. The nonreinforced control child, on the other hand, displayed a consistently lower number of forms that actually decreased slightly from baseline (8.87) to treatment (7.63).

New Forms

Figure 2 graphs the mean number of new criterion forms observed by the two raters for each child for each baseline and

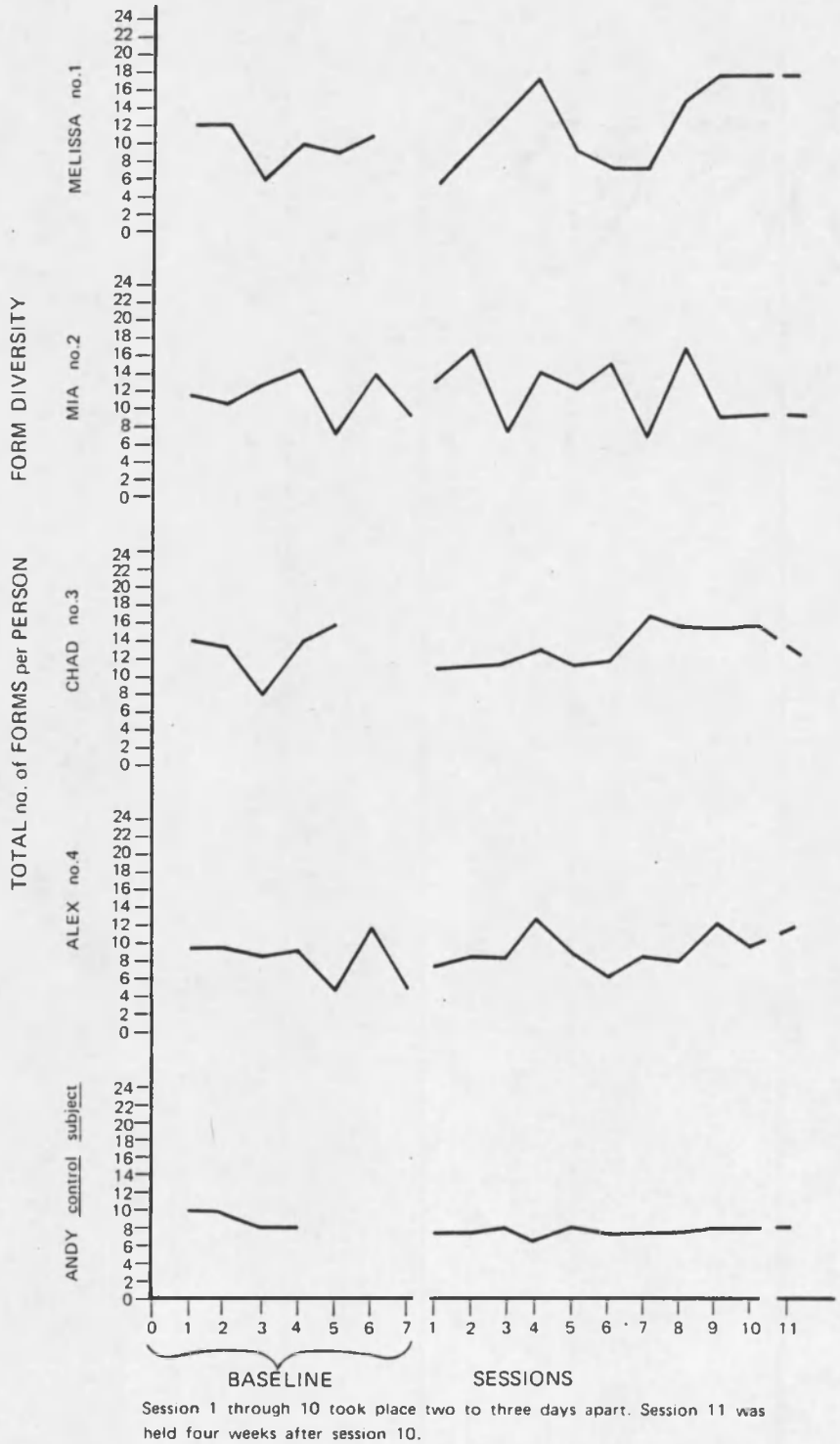
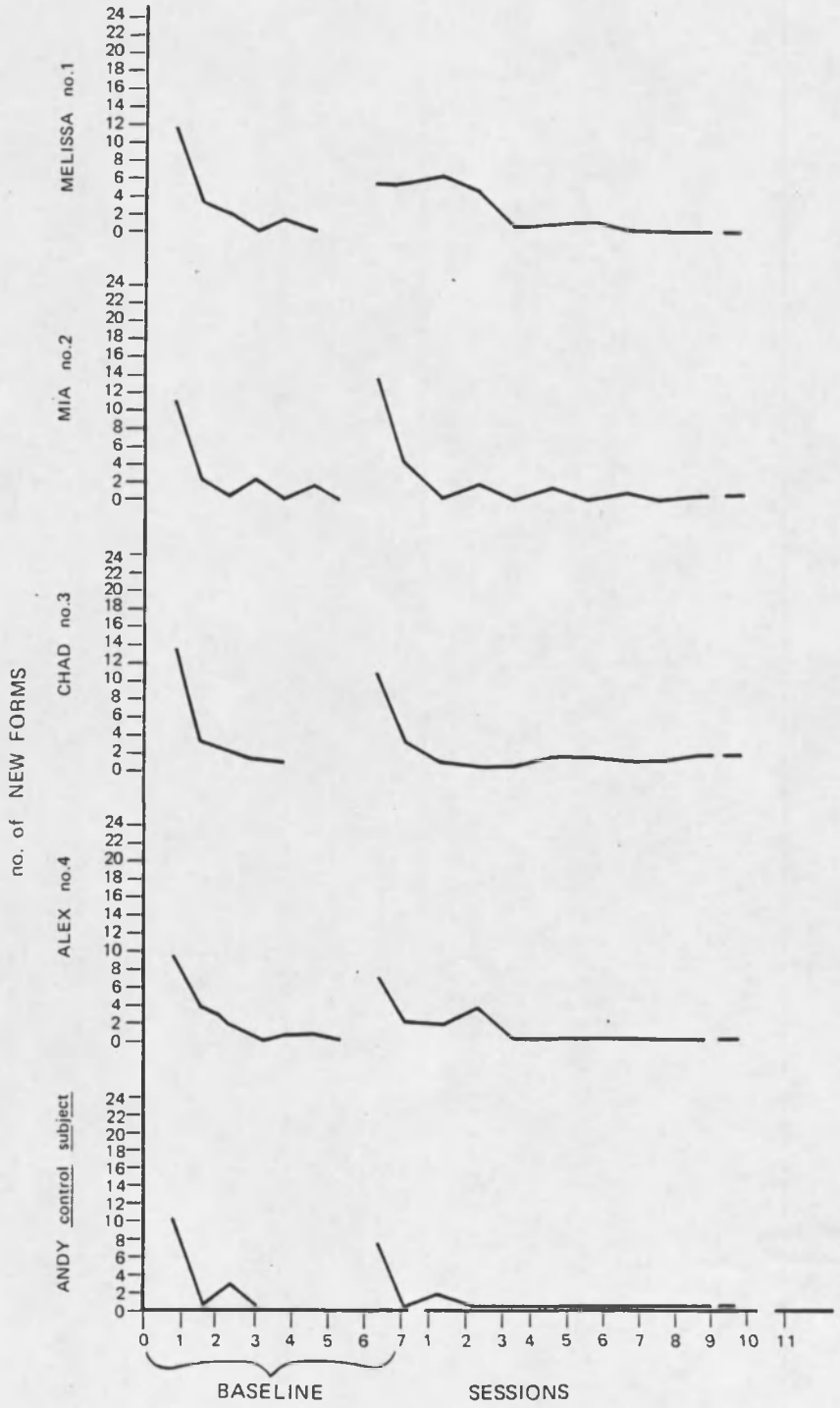


Figure 1. Mean Form Diversity Scores for Baseline and Treatment Sessions



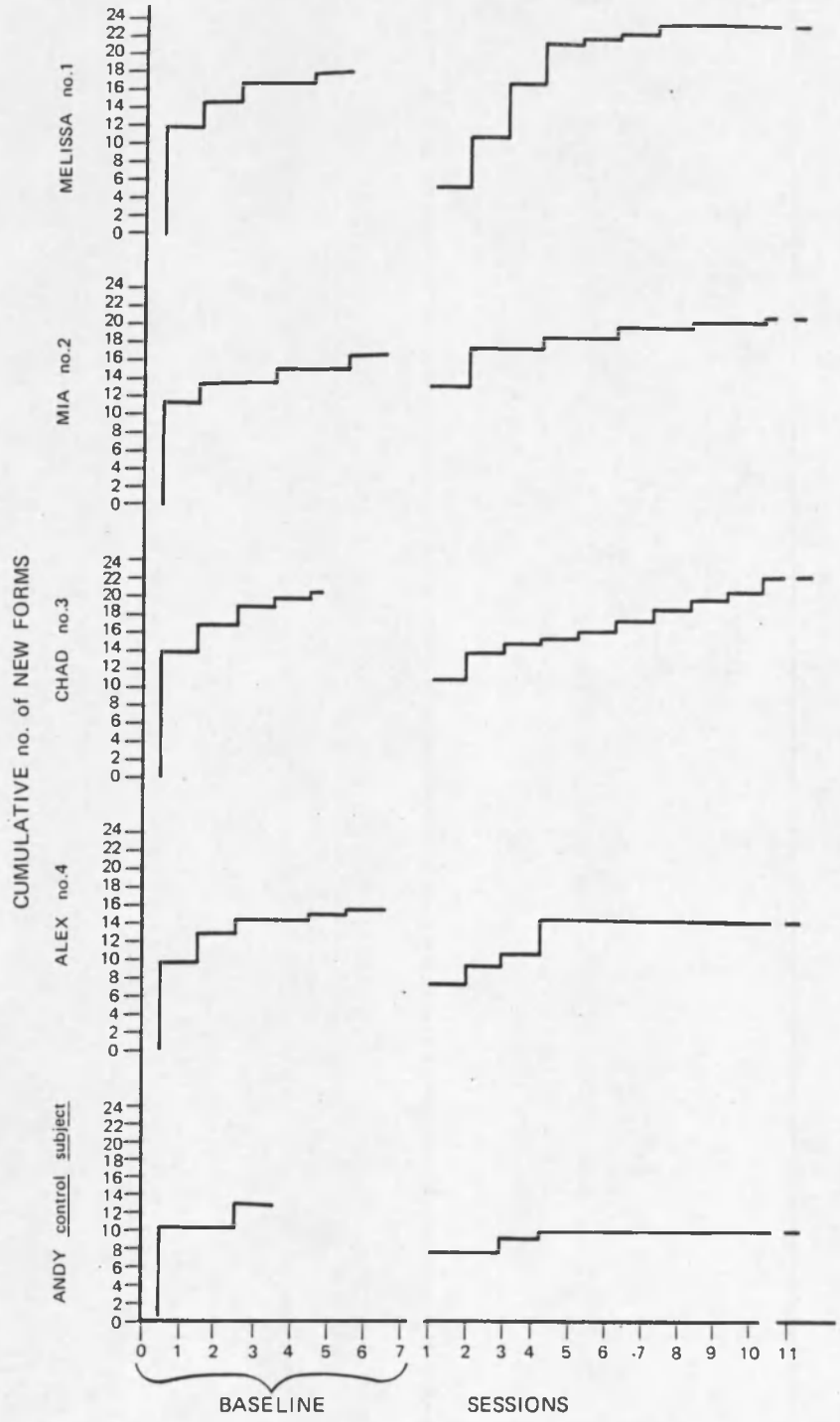
Session 1 through 10 took place two to three days apart. Session 11 was held four weeks after session 10.

Figure 2. Mean New Forms Diversity Scores for Baseline and Treatment Sessions

treatment session. New forms score for all children were noticeably higher on the first day of treatment because all forms drawn on that day were recorded as new forms. All reinforced children except one (Child 2) produced less new forms during the first treatment session than during the initial baseline session when all forms were considered new forms.

All but one (Child 4) of the reinforced children's cumulative new forms scores during treatment exceed those during baseline. The five children's mean cumulative new form scores for baseline and treatment sessions are shown in Figure 3. Each bar represents the total number of new forms displayed by the children so far in their baseline and treatment sessions. The noticeable drop in cumulative new forms from baseline ending sessions to beginning treatment sessions is because in the first session of treatment all forms were considered new forms. The resulting cumulative number of new forms produced for each child for baseline and treatment sessions are as follows: Child 1 produced 18 forms for baseline and 23 for treatment; Child 2 produced 17 new forms during baseline to 21 forms during treatment; Child 3 produced 20 baseline forms and 22 forms in treatment; Child 4 produced 15 forms for baseline and 14 forms for treatment.

The control child significantly reduced his number of new forms from nonreinforced baseline (12) to nonreinforced treatment sessions (9).



Session 1 through 10 took place two to three days apart. Session 11 was held four weeks after session 10.

Figure 3. Mean Cumulative New Forms Scores for Baseline and Treatment Sessions

Session Length

All of the reinforced children spent more time on the drawing task as they proceeded from baseline through the treatment sessions. The mean session length for Child 1 was five minutes during baseline, which increased to six minutes for treatment sessions. Child 2 drew an average of three minutes during baseline and six minutes during treatment. Child 3 increased his time from an average of two minutes in baseline sessions to four minutes in treatment. Child 4 had a mean baseline session length of 1.5 minutes and increased to two minutes for treatment. The control child spent less time on his drawings from the first one to the last, averaging two minutes during baseline and only one minute during treatment sessions.

Social Validation

Social validation data show that both art teachers judged all but one child's drawings from reinforcement sessions as more creative than those from baseline sessions. The exception was not the child reported as producing fewer new forms from baseline to treatment sessions.

Comparisons were made across four baseline drawings and four treatment drawings on a five-point rating scale (four, extremely creative; zero, no creativity). The drawings were randomly presented to the raters, art teachers who were unaware of whether drawings were from baseline or treatment sessions.

To determine whether any correspondence existed between the effectiveness of the raters' definitions of creativity and the form diversity score, drawings of Child 1 from both baseline and reinforcement sessions were selected to contain the same number of forms. Baseline drawings of children 2, 3, and 4 all had a lower form diversity score than their drawings from treatment sessions. Both art teachers rated the first child as having the same creativity level for the drawing completed during baseline and the drawing completed during the treatment session, and all other children as being more creative in the drawings completed during treatment.

Specific teachers' ratings of the eight drawings were as follows: Child 1 received a mean rating of 3.5 during baseline and 3.5 for treatment; Child 2 received a mean rating of 2.5 for baseline and 3.5 for treatment; Child 3 received a mean of 2.0 for baseline and 4.0 for treatment sessions; Child 4 received a mean of 0.5 for baseline and 1.5 for treatment.

The children were also compared to four peers considered to be good art students. The mean rating for the four art peers was 2.6. The mean rating of the four experimental children across treatment phases was 3.1. These scores reveal that the experimental group, who were initially regarded as less creative than their peer group, obtained slightly better ratings on their reinforced drawings as compared to their peers.

Follow-Up

A follow-up session was conducted four weeks after completion of the last treatment (reinforced) drawings. No reinforcement was given. The results of this follow-up session revealed that only one of the experimental children (Child 3) decreased the number of forms previously used in the treatment sessions (see Figure 1). All of the other experimental children maintained or showed a slight increase in the number of forms used during treatment sessions.

CHAPTER 5

DISCUSSION

In replicating Kratochwill et al. (1979), this study sought to reveal a measurable increase in children's new drawing forms by applying descriptive reinforcement procedures that were used earlier to increase children's painting forms. Although this increase occurred, the similarities of the two studies have proved to be less interesting than their differences.

Form Diversity

Whereas children in the earlier study began their paintings with nonschematic forms, progressing with reinforcement to schematic depictions, the children in this study were clearly more adept at drawing than at painting. They displayed schematic forms during baseline and thus immediately accumulated higher form diversity scores. The subsequent occurrence of new forms therefore was infrequent, and so, consequently, was reinforcement.

In all cases, however, children had higher form diversity scores during treatment than during baseline. Perhaps because of lack of reinforcement these scores occurred in an apparently irregular pattern, showing no consistent upward progression as they did during painting, although they tended to increase toward the

end of treatment. In no case did the form diversity scores during treatment fall below the lowest score recorded for baseline, and in most cases the lowest treatment score was considerably higher than the baseline low. Baseline form diversity scores, while high, tended to proceed in a more or less straight line. In all but one case the form diversity scores at the completion of treatment remained constant when re-examined four weeks later, and the regression in that case was not severe.

New Forms

Children who painted produced more and more new forms at a steady rate. Children who drew also produced more diverse forms in their drawings, but the pattern of emergence reflected the lack of consistent reinforcement procedures. New forms scores began relatively high during both baseline and treatment, and steadily declined thereafter until by the fifth treatment session new forms scores for all of the reinforced children approximated those for the nonreinforced control child, that is, few if any new forms appeared. Future attempts to enhance growth in drawing with children of this age and older will therefore need to elicit new forms to be reinforced instead of depending on each child's initiative in elaborating images. The children in this study exhibited a pronounced reluctance to change an established schematic image, in contrast to the painters whose nonschematic pictures were generally in flux.

Had the children exhibited an inclination to change and to produce new forms, another difficulty would have been encountered. All of the children except the control child came close to the top of the criterion scale being used. Other scales have been devised, such as the contour drawing scale used by Salome and Reeves (1972) and Rush, Weckesser, and Sabers (1980). Children who drew used from 9.5 to 14 of the 24 drawing criteria during baseline, while children of the same age who painted displayed only six to eight forms. Ending scores, however, were similar: between 14.5 and 23.5 for children who drew, and 20 and 24 for those who painted. Because of this difference, it would appear that kindergarten children on the whole have higher levels of form diversity in their drawings than in their paintings. Since they are capable of expanding their form vocabulary with practice and teaching, we assume that their lower form diversity in painting is due to a lack of experience, or a difficulty in control of the painting medium, rather than differences in perceptual development.

In comparing form divergence scores with new forms scores we see that even though they did not initiate new forms in later treatment sessions, children continued to use their larger vocabulary of forms. The one child who did not increase his total number of new forms from baseline to treatment apparently became discouraged by his lack of reinforcement--his new forms cease to appear after the fifth session.

Session Length

The present study confirms the findings of Kratchowill et al. (1979) with regard to the increasingly longer time that children spent on their drawing task. Although the time increase could be construed as a reflection of the mechanics of drawing (more figures take more time), it may also reflect increased interest. The control child, for example, actually decreased the amount of time he used without decreasing his form diversity score. Having established a pattern of repetitive shapes, he may have taken less time to repeat the drawing. On the other hand, his increasing boredom or the other children's increasing enthusiasm may have affected their attention span.

Social Validation

Art teachers judged that all children within this study whose form diversity scores improved from baseline to treatment also improved in creative ability. As Kratochwill et al. (1979) found, these teachers felt that treatment children improved their creative responses to the point where they rose above their art peers who were initially considered better. Since both this study and the earlier one revealed that children with low form diversity scores were considered noncreative and those with high form diversity scores creative, form diversity emerges as a criterion of artistic creativity employed by elementary school art teachers and in research too, therefore, a valid criterion by

which to measure creative responses in the drawings produced in this study.

Follow-Up

Continued high performance of the reinforced children after four weeks showed that new forms, once established, continued to appear. Although all the children showed high form diversity in baseline sessions, their usage of those forms fluctuated. The reinforcement sessions encouraged the children to employ a variety of forms and established durable behavior in this regard.

Conclusion

Art teachers need to employ a variety of teaching methods to reach their desired educational goals. We teachers of youngsters especially should remember the effectiveness of our personal presence in influencing our students and the importance of any encouragement we give them, whether verbal, as in this study, or through more subtle body language. In early childhood situations and the primary grades, particularly, positive reinforcement can greatly enhance teachers' paramount function of introducing new media and encouraging skill development commensurate to that which children often display in drawing but lack in other forms of graphic expression with which they have less experience.

Both of these studies have shown that children who work in art media other than pencil or crayon drawing have the potential

to create forms whose diversity equals those observed in their drawn images, but which may be temporarily inhibited due to unfamiliarity with the medium. We should be aware that by maintaining a classroom where reinforcement is contingent upon form diversity or other desired artistic behaviors we encourage children to grow artistically and to maintain their higher levels of graphic expression. The results are promising enough that future studies need to be undertaken offering opportunities for advanced growth with more sophisticated criteria by which to measure a higher level of creative activity.

APPENDIX A

SOCIAL VALIDITY RATING FORM

Social Validation of within Subject Drawings
(Baseline and Treatment Comparisons)

Instructions: Please rate the eight drawings on the following scale. You should rate each drawing for existence of creative forms (responses). Please circle your responses.

Subject: _____

Rating:
0 = Demonstrates no creativity
1 = Demonstrates only limited creativity
2 = Demonstrates average creativity
3 = Demonstrates above average creativity
4 = Demonstrates exceptional creativity

0 1 2 3 4

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