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ABSTRACT

A creative-aesthetic approach to school readiness and beginning reading and arithmetic, as formulated by Fortson, was used with 24 kindergarten children. Two control groups included 39 children. Two replications of the study were made, each having two experimental groups. Experimentals scored signifcantly higher on tests of creative thinking, problem solving, and originality. Fluency, flexibility, and originality were consistantly high, around the 5th grade levels, in the study and its replications; elaboration fluctuated somewhat. (Author/JD)

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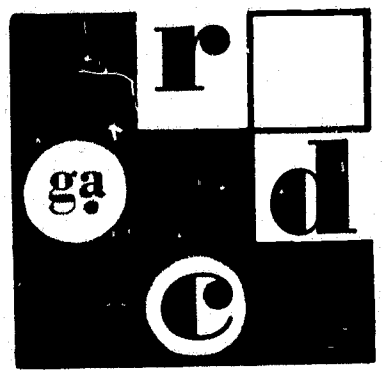

Research and Development Center in Educational Stimulation

University of Georgia Athens, Georgia

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EDUCATIONAL STIMULATION

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INTRODUCTION

Many sensitive observers have for years noted that children lose much of their imaginativeness and creativeness during their kindergarten year or at about age five. Perhaps the most systematic and careful psychometric documentation of creative and imaginative functioning and development during the preprimary years is that of Elizabeth Andrews (1930) at the University of Iowa Child Study Center. She used a variety of psychometric methods and types of imagination and creative activity. Three of her tests were presented tachistoscopically with the task of forming new products (transformations). The following kinds of observation were made of the imaginative play of children from age two to six: imitation, experimentation, transformation of objects, transformation of animals, acts of sympathy, dramatizations, imaginary playmates, fanciful explanations, fantastic stories, new uses of stories, constructions, new games, extensions of language, appropriate quotations, leadership with plan, and aesthetic appreciation.

On the basis of these data, Andrews found that total imaginative scores are highest between four years and four six months, with a sudden drop at about age five when the child enters kindergarten. Ability to redefine, restructure, or recombine reached a peak between three and four years and from then on decreased. Analogy reached a height during the fourth year and declined during the fifth year. "Don't know" responses decreased steadily with chronological age up to five years and then increased somewhat. The more creative types of imagination reached a high point from ages three years, six months to four years, six months, and their lowest ebb during the fifth year.

Just as impelling evidence has been cited by non-psychometrically oriented investigators. For example, Susan Nichols Pulsifer (1963) observed that many of the children with whom she worked composed excellent poems and songs at age four or four and one-half but that their original and creative expression ceased almost entirely at about the time they entered school for the first time. While riding beside her in the car, children would frequently produce songs before age five. After they entered school, however, she was unable to get them to produce anything original. While others have generally attributed these phenomena to natural developmental changes or to a necessary consequence of socialization of the child, Mrs. Pulsifer has contended that this stilling and silencing of the child's impulse to poetic and individual thought and action are neither natural nor necessary. She believes that some diminution is a necessary consequence of group activity and the strong influence of other children. She believes further that the school and home may in some degree lessen and mitigate what she considers a serious loss of creative and individual thought and expression.

As the author began finding a decrease in certain creative thinking abilities during the kindergarten year and observing the ways they were taught, he began wondering if these decreases might be explained in terms of the kinds of behavior the teachers encouraged and discouraged. To obtain information concerning the behaviors encouraged and discouraged by kindergarten teachers, the author (Torrance, 1968) administered the Ideal Child Checklist to 185 kindergarten teachers and 83 parents of kindergarten children. The Ideal Child Checklist consists of 66 behaviors that have been found in empirical studies to differentiate between highly creative people and less creative people who have had similar opportunities to develop. The parents and teachers were instructed to check those behaviors they encouraged, double check the ones they discouraged. A value of two points was assigned for double checks; one, for single checks; and minus one, for strike throughs. For each group, these values were summed for each behavior and each behavior was then rank-ordered from most encouraged to most discouraged. The more refined Q-technique methodology (Stephenson, 1953) was used in obtaining ratings of the ideal, productive, creative person by a panel of ten expert judges. It was then possible to rank-order these ratings and to correlate them with the rankings derived from the data supplied by kindergarten teachers and the parents of kindergarten children.

The rank-order coefficients of correlation between the rankings of the experts and those of the kindergarten teachers and parents of kindergarten children were .29 and .04 respectively. The rankings of the kindergarten teachers and those of parents was .90. Thus, there is considerable discrepancy between the kinds of behavior kindergarten teachers and parents of kindergarten children believe should be encouraged and discouraged and those that experts (students of the creative personality) believe should be encouraged and discouraged.

Examining the specific discrepancies between the expert and teacher and parent ratings (Torrance, 1968), it appeared that these parents and teachers may unduly discourage such behaviors as: adventurousness, question asking, attempting difficult tasks, becoming absorbed in tasks, being courageous in convictions, being critical of others disturbing group procedures, dominance, expressing strong emotions, emotional sensitivity, faultfinding, guessing, independence in judgment, intuitiveness, liking to work alone at times, persistence, preference for complex tasks, occasional regression, self-assertiveness, self-initiating behavior, spiritedness in disagreement, striving for distant goals, stubbornness, unwillingness to accept things on mere say-so, building dream castles, and willingness to take risks. At the same time, they may be over-emphasizing such behavior as: courtesy, display of consideration of others, competitiveness, doing work on time, physical health, industriousness, neatness and orderliness, obedience, popularity and being well liked by peers, receptiveness to the ideas of others, social adjustment, versatility and well-roundedness, and willingness to accept the judgments of authorities.

For some time the author had maintained that a kindergarten approach that encouraged creative characteristics would accelerate rather than regress creative development. He had observed several kindergarten teachers whose approaches encouraged some creative characteristics but rather severely discouraged other characteristics that seem equally important to creative development. None of them consistently and systematically encouraged creative growth. To some extent, all were dominated by socialization and control objectives. The Creative-Aesthetic Approach formulated and implemented by Dr. Laura R. Fortson (1967ab), however, appeared to be a model which consistently and systematically encouraged creative behaviors and to be ideally suited to test the author's hypothesis concerning the continuity of creative development during the kindergarten year.

PROCEDURES

Creative-Aesthetic Approach to School Readiness and Beginning Reading and Arithmetic

The concept of the "Creative-Aesthetic Approach to School Readiness" was formulated and elaborated by Laura R. Fortson as a part of the program of research of the Research and Development Center in Educational Stimulation at the University of Georgia. The program was established through the cooperation of the Research and Development Center and the Clarke County Schools.

The Creative-Aesthetic Approach aims primarily at developing in preschool children the beginnings of intellectual skills, abilities, and attitudes which are transferable to later learning situations. Activities are carefully planned to elicit from children maximum creative thinking, problem solving, fluency of ideas, and fluency in verbal expression, and to develop auditory and visual awareness and discrimination. Children are encouraged to offer ideas freely, hazard guesses, test their ideas, and to try to predict possible outcomes.

The intellectual skills vital to the child's subsequent school achievement are identified and encouraged in kindergarten through guided creative activities and games which are both intellectual and aesthetic, yet child-appropriate in that they hold elements of surprise, imaginative delight, and self-discovery. Aimed at fostering specific cognitive skills and attitudes, the activities are designed to appeal to the young child's natural curiosities, his desire to explore and experiment and to express his ideas creatively, his sense of wonder and his natural urge to become totally involved intellectually, emotionally and physically in discovering what the work is like.

Children's own compositions furnish materials for beginning reading, phonics games, number games, and dramatizations. Original poems, stories, or "thoughts" are dictated to the teachers who write them on large charts. These become phonics games as children play with words and substitute initial vowels or constants to form rhyming words or games of visual discrimination.

Number concepts and "sets" are reinforced through music, rhythms, and creative dancing. Beginning arithmetic, in addition to being beaten out and danced, is literally "eaten up." After visits to the store children prepare candy mixes, puddings, and jello for later division. They become "flavorably" involved as they help divide four pies, six apples, a dozen doughnuts, or 48 Easter eggs among 24 children. Candies are arranged in sets and are added and subtracted before youngsters eat them. Tables, rugs, block houses and other objects in the kindergarten are measured and tulips planted in the fall are given happy and repeated measuring the spring.

Through creative use of art materials and tools, it was hypothesized, young children naturally increase their attention spans and their ability to manage frustration and stress as they attempt to manipulate materials. In persevering to accomplish goals which are uniquely their own and therefore meaningful to them, young children unselfconsciously adopt and practice habits of thought, and learn attitudes toward work, themselves, and others, which make for emotional and social well-being and continuity of development.

In 1966-67, the experimental program was carried on with a group of 24 five-year-olds under the direction of a teacher (Dr. Fortson) and a teacher-aide, a senior at the University of Georgia. The project was under the general supervision of Professor Warren G. Findley, Director of the Research and Development Center. The control school was chosen on the basis of similarity of parental occupations, proportionate racial mixture, facilities, and type of school. The control group consisted of both morning and afternoon groups. The teacher was quite experienced and an aide gave assistance with attendence reports, serving juice, and the like. There was no full-time aide, however. It was the impression of the senior author that the children in the control group were afforded more than the usual amount of freedom, experienced some creative activities, and were generally quite lively. They did seem to be somewhat more restrained than the children in the experimental group. The encouragement of creative behaviors was certainly not as consistent and systematic as in the Creative-Aesthetic Approach.

In 1967-68, there were two classes, each consisting of 24 five-year-olds taught by Dr. Fortson and Mrs. Carolyn Diener (Torrance, Fortson, and Diener, 1968), both using the Creative-Aesthetic Approach. The materials, methods, and activities used in 1966-67 were replicated as faithfully as possible. The teacher of the control classes modified her approach

slightly, however, and made some deliberate and consistent attempts to encourage creative activities. For example, she used some of the creative thinkin exercises and activities in Can You Imagine? (Myers and Torrance, 1965) and For Those Who Wonder (Torrance and Myers, 1966). The author's observations suggest that the teacher of the control classes encouraged more consistently and systematically the creative elements of the spontaneous socio-dramatic play with housekeeping equipment, block building, costumes, and the like than she had during the first year of the study.

In 1968-69, there were again two classes under the Creative-Aesthetic Approach taught by the same two teachers who conducted the 1967-68 classes. Although their classes were conducted under less favorable physical conditions and contained a larger number of disadvantaged children than during the previous year, the materials, methods, and activities were quite carefully replicated in all essential respects.

Instruments for Assessing Creative Functioning

1. Thinking Creatively with Pictures (Torrance Tests of Creative Thinking, Figural Forms A and B)

Each of these standardized batteries consists of three parallel tasks and each of the tasks is designed to tap a somewhat different aspect of creative functioning. The Picture Construction Task is accompanied by the following instructions and is designed to elicit originality and elaboration:

> At the bottom of this page is a piece of colored paper in the form of a curved shape. Think of a picture or an object of which this form would be an important part. Then lift up the piece of colored paper and stick it wherever you want it on the next page, just as you might stick a postage stamp. Then add lines with pencil or crayon to make your picture.
>
> Try to think of a picture that no one else will think of. Keep adding new ideas to your first idea so as to make it tell as interesting and exciting a story as you can.

The stimulus material for the Figure Completion Task consists of ten incomplete figures and is accompanied by the following instructions:

> By adding lines to this and the next page, you can sketch some interesting objects or pictures. Again, try to think of some picture or object that no one else will think of. Try to make it tell as interesting and as complete a story as you can by adding to and building up your first idea. Make up a title for each of your drawings, and later we'll help you write them down.

The Repeated Figures Task consists of two pages of figures (parallel lines in Form A and circles in Form B). The instructions for the Circles version are as follows:

> In ten minutes see how many objects or pictures you can make from the circles on this and the next page. The circles should be the main part of whatever you make. With pencil or crayon add lines to the circles to complete your picture. You can place marks inside the circles, on the circles, and outside the circles--whatever you want--in order to make your picture. Try to think of things that no one else will think of. Make as many different pictures or objects as you can and put as many ideas as you can in each one. Make them tell as complete and as interesting a story as you can.

In all administrations of this instrument in the present study, there was an initial warm-up session of about ten minutes during which imaginative responses were obtained to Munari's Elephant's Wish (1959). The test was administered in the classroom group with the usual ten-minute time limit for each of the three tasks. Most of the children had completed their work before time was called. At the end of the administration, the examiner and his assistants interviewed each child to record labels for his responses.

The rationale of the three tasks, reliability, validity data, and comparison group norms are presented in the technical-norms manual for the Torrance Tests of Creative Thinking (Torrance, 1966a). The tests were scored according to the published scoring guides (Torrance, 1966bc). Scores were obtained for fluency, flexibility, originality, and elaboration.

2. Mother Goose Problems Test

The Mother Goose Problems Test is a verbal test of creative thinking ability and consists of problems based on the world-famed Mother Goose rhymes. Each of the two forms consists of two problems, administered individually and orally and not timed. The children are supplied with booklets containing drawings of the Mother Goose situations and are encouraged to color them while they discuss the problem with the examiner and produce alternative solutions. A guide including a set of standardized encouraging questions was used in the administration (Torrance and Eubank, 1966). The basic questions for Form A are as follows:

1. What are all the things Mother Hubbard could have done when she found there was no food?

2. What are all the possible things that might have caused Jack and Jill to fall down the hill?

The basic questions for Form B are as follows:

1. What are all the things Bo Peep's sheep might have done when they got lost?

2. What are all the things that might have happened to the cow after she jumped over the moon?

Responses were scored for fluency, flexibility, and originality according to a previously developed scoring guide (Torrance and Eubank, 1967).

3. Starkweather Test of Originality

The Starkweather Test of Originality (Starkweather, 1965) was developed and standardized at Oklahoma State University. The testing materials used in the present study were produced under the direction of Dr. Starkweather. The materials for the pretest or warm-up session consist of six white styrofoam shapes which are placed before the child. He is asked, "Do you see a piece that looks like something?" and proceeds from there according to standardized guidelines. The test itself is administered by letting the child draw from a box one at a time forty colored styrofoam shapes. There are ten different shapes, and each is in four different colors (red, blue, green, and yellow). There are two forms of the test; one was used as a pretest and the other as a posttest. The test is not timed. The manual provided by Starkweather includes information about the rationale, administration, validity, and scoring procedures. The preocedures described by Starkweather were modified in that four colors instead of two were used in a single administration, and the forms were drawn randomly by the children instead of being presented two at a time in identical shapes.

General Procedures

Both the experimental and control groups in the 1966-67 study entered kindergarten in early September, 1966 and continued until about the first of June, 1967. It was not possible to start to administer the creative thinking test to the experimental group until January, 1967. A team of six examiners went to the school on four consecutive Tuesday mornings to administer two additional tests (Starkweather's Tests of Conformity-Non conformity and her Test of Willingness to Attempt the Difficult) not used in the posttest. The posttesting of both the experimental and controls was accomplished during a one-week period early in May, 1967. Data were available for all 24 children in the experimental group and for 39 in the control group.

In 1967-68, both the experimental and control classes were tested in September and again in May. Complete data were available for 44 experimentals and 36 controls. In 1968-69, there did not seem to be a need for a control

group since data were available for so many different comparison groups. The children in the experimental group were tested in September, 1968 and again in May, 1969.

RESULTS

The 1966-67 Study

The data obtained in 1966-67 permit us to make two types of comparisons: (1) pretest and posttest measures of the experimental group and (2) posttest measures of the experimentals and the controls. It would have been desirable, of course, to have obtained baseline measures on both the controls and experimentals early in September, 1966. The data obtained permit us to make statements concerning creative growth in the experimentals over a period of about three months and concerning the end-of-the-year functioning of the experimentals compared with the controls.

The data presented in Table 1 permit us to assess creative growth among the 24 members of the experimental group during the period from late January and early February to early May, 1967. The table contains means, standard deviations for the pre- and posttest performances and tests of significance of the differences.

Table 1

MEANS, STANDARD DEVIATIONS, AND TESTS OF SIGNIFICANCE OF THE DIFFERENCES BETWEEN PRETEST AND POSTTEST PERFORMANCE OF THE EXPERIMENTAL GROUP ON THE CREATIVITY MEASURES IN JANURAY, 1967

Measure	January-February Means	S.D.	Early May Means	S.D.	t-ratio	Level Significance
Verbal Fluency (Mother Goose Problems)	7.27	3.27	10.17	4.19	2.624	< .05
Verbal Flexibility (Mother Goose Problems)	5.18	1.68	7.92	2.53	4.346	< .01
Verbal Originality (Mother Goose Problems)	7.73	6.22	15.92	6.42	4.389	< .01
Figural Fluency (Torrance Tests of Creative Think.)	32.32	5.82	34.92	4.19	1.797	< .01
Figural Flexibility (Torrance Tests)	35.12	6.74	37.92	5.84	1.554	> .10
Figural Originality (Torrance Tests)	44.16	9.43	61.58	17.34	4.347	< .01
Figural Elaboration (Torrance Tests)	38.16	8.48	39.67	7.20	0.670	> .10
Figural Total (Torrance Tests)	148.96	25.19	174.08	24.10	3.573	< .01
Originality (Starkweather)	34.88	15.64	36.67	15.24	0.402	> .10

From these results it will be noted that there was substantial and statistically significant growth on the measures of verbal fluency, flexibility, and originality; figural orginality; and total figural creativity. No significant growth was expected on the Starkweather Originality Test as the group mean was initially quite close to the ceiling for the test.

On the figural test, the experimental subjects sacrificed fluency, flexibility, and elaboration to some extent by their originality. This was especially true in the posttest when many of them combined two or more circles to form quite original forms. For example, one of the most creative children

in the class used an entire page of circles to form a spider-web. Some of the circles were used as egg sacks for the spider. Some of them were used as a part of the spider's body, and others were used as a part of the interesecting areas of the web. The scoring system permits a bonus for originality as this type of response has been found to characterize highly creative individuals, but it does not permit an adjustment for fluency, flexibility, and elaboration. All the differences were in the direction of growth, however, and the total creative energy as reflected by the mean total score shows a statistically significant difference at the one percent level of confidence.

The data provided in Table 2 make possible a comparison of the end-of-the year functioning of the experimentals and controls. The table includes the means, standard deviations, t-ratios, and level of statistical significance of the differences between the means of the experimentals and controls. It will be noted that all the verbal and all the originality measures are of considerable magnitude and are statistically significant. The figural fluency, flexibility, and elaboration measures, however, produce significant differences only at about the ten percent level of confidence. The possible reason for this has already been stated.

Table 2

MEANS, STANDARD DEVIATIONS, AND TESTS OF SIGNIFICANCE OF THE DIFFERENCES BETWEEN THE EXPERIMENTALS AND CONTROLS ON THE CREATIVITY MEASURES IN EARLY MAY, 1967

Measure	Experimentals Means	Experimentals S.D.	Controls Means	Controls S.D.	t-ratio	Level Signif.
Verbal Fluency (MG)	10.17	4.19	4.28	1.47	6.652	< .01
Verbal Flexibility (MG)	7.92	2.53	4.25	1.46	4.706	< .01
Verbal Originality (MG)	15.92	6.42	4.43	2.40	8.420	< .01
Figural Fluency (TTCT)	34.92	5.82	32.11	7.02	1.975	< .10
Figural Flexibility (TTCT)	37.92	5.84	37.03	8.07	0.503	> .10
Figural Originality (TTCT)	61.58	17.34	43.55	11.66	4.492	< .01
Figural Elaboration (TTCT)	39.67	7.20	36.66	5.43	1.756	> .10
Originality (Starkweather)	36.67	15.24	16.89	16.06	4.900	< .01

The 1967-68 Study

Since both the experimental and control groups had been tested in September, 1966 and again in May, 1967, it was possible to regress or adjust the posttest means to correct for pretest scores. The results of this process and of the analyses of variance are shown in Table 3. It will be noted that all the means favor the Creative-Aesthetic Approach over what might properly be called a "Modified Creative Kindergarten Approach." Only the differences for figural fluency, figural elaboration, Starkweather originality, and Mother Goose originality attain statistical significance. The means of the children in the Creative-Aesthetic Approach, however, were at about the same level as in 1966-67, whereas there was a marked rise in the figural originality of the children in the "Modified Control" group. The general pattern of development of the children in the Creative-Aesthetic Approach was the same as in the previous year. However, there was a trend for originality to drop and for elaboration to rise.

Table 3

ADJUSTED POSTTEST RAW SCORE MEANS OF KINDERGARTENERS UNDER CREATIVE-AESTHETIC AND MODIFIED-TRADITIONAL CONDITIONS AND ANALYSIS OF VARIANCE, 1967-68

Measure	Adjusted Means		F-ratio	Level of Signif.
	Creat.-Aest. (N=44)	Mod-Kg. N=36)		
Fig. Fluency	16.40	13.96	2.20	$<.05$
Fig. Flexibility	11.44	10.95	0.17	NS
Fig. Originality	23.32	20.97	0.67	NS
Fig. Elaboration	47.81	37.22	2.71	$<.05$
Starkweather Originality	34.65	18.40	87.40	$<.01$
Mother Goose Fluency	9.39	7.64	0.71	NS
Mother Goose Flexibility	6.26	6.11	0.04	NS
Mother Goose Originality	14.44	10.69	1.84	.10

The 1968-69 Study

Since much of the evaluation of the outcomes of the 1968-69 replication of the Creative-Aesthetic Approach rests upon small group assessment procedures which will be treated in separate reports, the present evaluation will be limited to the Figural Forms of the Torrance Tests of Creative Thinking Ability. The results of tests administered in September 1968 and again in May, 1969 are summarized in Table 4. Again it will be noted that there were statistically significant gains on all of the measures at less than the .05 level of confidence.

Table 4

MEANS AND STANDARD DEVIATIONS ON FIGURAL FORM OF TORRANCE TESTS OF CREATIVE THINKING FOR 1968-69 CREATIVE-AESTHETIC KINDERGARTENERS (N=48)

Measure	Pretest		Posttest		t-ratio
	Means	St. Dev.	Means	St. Dev.	
Fluency	31.9	8.8	35.0	6.1	2.01*
Flexibility	34.7	8.8	38.4	6.5	2.38*
Originality	39.4	15.9	56.4	17.6	4.98*
Elaboration	25.9	4.2	53.3	10.7	16.68*

Consistency of Effects of Creative-Aesthetic Approach

Data concerning the consistency of the Creative-Aesthetic Approach on the kinds of development assessed by the Figural Forms of the Torrance Tests of Creative Thinking are summarized in Table 5. It will be noted from these data that the pattern of development achieved during the first year of the Creative-Aesthetic Approach was essentially duplicated during the subsequent two years with different groups of children and in two different schools. All means are reported in terms of standard scores based on fifth-grade norms. This means that the five-year-olds who completed a school term in the Creative-Aesthetic Approach to educational stimulation ranged from .64 to 1.16 standard deviations above the mean for fifth graders on originality, from 1.51 to 1.18 standard deviations below the means on fluency and flexibility, and from 1.03 below the mean to .33 above the mean on elaboration. It is interesting that the major change in pattern of development was in the area of elaboration.

Since elaboration is definitely the most age-related of the figural measures, this change is quite remarkable. As the teachers became more skilled in the Creative-Aesthetic Approach, they apparently became more skilled in developing ability to elaborate.

Table 5

MEAN STANDARD SCORES AND STANDARD DEVIATIONS ON FIGURAL FORM OF TORRANCE TESTS OF CREATIVE THINKING OF 5-YEAR-OLDS AFTER ONE YEAR OF CREATIVE-AESTHETIC EDUCATIONAL STIMULATION FOR THREE YEARS

Variable	1967-68 (N=24)		1968-69 (N=44)		1969-70 (N=48)	
	Means	St. Dev.	Means	St. Dev.	Means	St. Dev.
Fluency	34.9	5.8	38.4	6.5	35.0	6.1
Flexibility	37.9	5.8	37.6	8.1	38.4	6.5
Originality	61.6	17.3	58.7	16.8	56.4	17.6
Elaboration	39.7	7.2	40.8	5.8	53.3	10.7

It is interesting to compare the pattern of functioning manifested by the children in the Creative-Aesthetic Approach with the pattern of functioning of various comparison groups at the end of a preprimary experience or at the beginning of the first grade. Data for five such comparison groups are shown in Table 6. It will be noted that the means for the Control Kindergarten Group in an Atlanta school were at about the same level on all four measures, with originality slightly elevated. When the Control teacher injected more consistent and systematic creative activities into her curriculum, however, originality went up about a standard deviation over the previous year but the other scores remained at almost the same level. The beginning first graders who had experienced one year of what might be called a Cognitive-Structured Approach scored consistently at about one standard deviation below the mean on elaboration. Their controls, however, socred at about the same level on all four scores. The modified creative approach used with the Duluth, Minnesota, University of Minnesota Laboratory School kindergarten produced an effect very much like the Creative-Aesthetic Approach produced in Athens, Georgia. It is especially interesting to note that all three approaches using any type of consistent and systematic attempt to encourage creative development succeeded in bringing the children to a high level of originality apparently without sacrificing fluency, flexibility, and elaboration.

Table 6

MEAN STANDARD SCORES AND STANDARD DEVIATIONS ON FIGURAL FORM OF TORRANCE TESTS OF CREATIVE THINKING OF END OF THE YEAR KINDERGARTENERS AND BEGINNING FIRST GRADERS

Variable	1966-67 Control Kg. (Atlanta) (N=39) Means	St. Dev.	1967-68 Control Kg. (Atlanta) (N=48) Means	St. Dev.	1967-68 1st Grade (Exp. Cog.) (N=55) Means	St. Dev.	1967-68 1st Grade Controls (N=55) Means	St. Dev.	Kg. Mod. Creative (Duluth, Minn.) (N=23) Means	St. Dev.
Fluency	32.1	7.0	34.8	5.6	39.0	8.3	40.4	10.5	39.7	6.9
Flexibility	37.0	8.1	37.3	5.4	41.8	9.6	44.4	10.0	43.6	7.7
Originality	43.5	11.7	53.8	10.6	40.9	9.8	40.0	10.6	54.1	14.6
Elaboration	36.7	5.4	36.0	6.3	47.3	7.3	43.9	11.1	43.2	5.7

SUMMARY

Earlier studies of imagination and creative functioning had seemed to indicate that children experience a discontinuity in their creative development during their fifth year. It was hypothesized that the Creative-Aesthetic Approach to School Readiness and Beginning Reading and Arithmetic, as formulated and elaborated by Fortson, would result in continued creative growth and functioning. It was also hypothesized that the Creative-Aesthetic Approach would result in a higher level of creative functioning than kindergarten classes experiencing what might be regarded as a "standard" or "traditional" kindergarten program.

Late in January and early in February, 1967, the 24 children in the experimental group were administered Figural Form A of the Torrance Tests of Creative Thinking, Form A of the Mother Goose Problems Tests, and the Starkweather Test of Originality. Early in May, 1967, the 24 children in the experimental group and 39 children in the two control groups were administered Figural Form B of the Torrance Tests of Creative Thinking, Form B of the Mother Goose Problems Test, and the Starkweather Test of Originality.

The results indicated that the experimentals showed statistically significant gains on all three of the verbal measures, figural originality, and total figural creativity. They also showed statistically significant superiority to the control group on all three of the verbal creativity measures and on all the originality measures.

The major limitations of the 1966-67 study were the failure to test the subjects in both the experimental and control classes early in the school year and the possible bias resulting from the personalities of the two teachers involved. It is recommended that the study be replicated with testing for baseline functioning at the beginning of the school year and near the end of the school year and that at least two classes using the Creative-Aesthetic Approach be studied.

In 1967-68, an effort was made to correct the foregoing limitations. Two classes, taught by two different teachers, followed the Creative-Aesthetic Approach. Both the experimentals and controls were tested in September and again the following May. The Control teacher, however, introduced into her teaching more creative activities but did not make any attempt to begin reading and arithmetic instruction as was done in the Creative-Aesthetic Approach. There were no statistically significant differences in the results produced by the two teachers using the Creative-Aesthetic Approach. Although the differences between the experimentals and controls noted in 1966-67 were reduced, there were still statistically significant differences in figural fluency, figural elaboration, Starkweather originality, and Mother Goose Problems originality.

The Creative-Aesthetic Approach under the same two teachers who conducted it in 1967-68 was repeated in 1968-69 in a different school. Again, impressive gains were shown by the children who participated and the pattern of creative development that resulted was about the same except for a considerable rise in ability to elaborate.

The patterns of creative functioning produced in each of the three years seemed to be quite similar, with fluency and flexibility falling consistently at a level slightly over one standard deviation below the means for the fifth-grade norms group and originality at a level more than one-half standard deviation above the mean for this norm group. Elaboration fluctuated somewhat, rising somewhat year by year, suggesting that the development of elaboration is not inconsistent with the development of originality. In the comparison groups, the level of functioning was about the same on all four measures, except when the mode of educational stimulation was characterized by a more or less consistent and systematic attempt to encourage creative behaviors. In these cases, the level of functioning on originality was elevated.

REFERENCES

Andrews, Elizabeth G. "The Development of Imagination in the Preschool Child," University of Iowa Studies in Character, 1930, 3(4).

Fortson, Laura R. "Reading Readiness and Beginning Reading in the Kindergarten." Athens, Ga." Research and Development Center in Educational Stimulation, University of Georgia, 1967 (mimeographed).

Fortson, Laura R. "A Creative-Aesthetic Approach to Beginning Skills in Modern Mathematics in the Kindergarten." Athens, Ga.: Research and Development Center in Educational Stimulation, University of Georgia, 1968 (mimeographed).

Munari, B. The Elephant's Wish. Cleveland, Ohio: World Publishing Co., 1959.

Myers, R. E. and Torrance, E. P. Can You Imagine? Boston, Mass.: Ginn and Co., 1965.

Myers, R. E. and Torrance, E. P. For Those Who Wonder. Boston, Mass.: Ginn and Co., 1966.

Pulsifer, Susan Nichols. Children Are Poets. Cambridge, Mass.: Dresser, Chapman & Grimes, 1963.

Starkweather, Elizabeth K. "An Originality Test for Preschool Children." Stillwater, Okla.: Oklahoma State University, 1965 (mimeographed).

Stephenson, W. The Study of Behavior. Chicago, Ill.: University of Chicago Press, 1963.

Torrance, E. P. Torrance Tests of Creative Thinking: Norms-Technical Manual (Research Edition). Princeton, N. J.: Personnel Press, Inc., 1966a.

Torrance, E. P. Torrance Tests of Creative Thinking: Directions Manual and Scoring Guide, Figural Test Booklet A. Princeton, N. J.: Personnel Press, Inc., 1966b.

Torrance, E. P. Torrance Tests of Creative Thinking: Directions Manual and Scoring Guide, Figural Test Booklet B. Princeton, N. J.: Personnel Press, Inc., 1966c.

Torrance, E. P. Must Preprimary Educational Stimulation Be Incompatible with Creative Development? p. 55-73 in F. E. Williams (Ed.), Creativity at Home and in School. St. Paul, Minn.: Macalester Creativity Project, Macalester College, 1968.

Torrance, E. P. and Eubank, Sandra. Examiner's Manual for the Mother Goose Problems Test. Athens, Ga.: Georgia Studies of Creative Behavior, College of Education, University of Georgia, 1966 (mimeographed).

Torrance, E. P. and Eubank, Sandra. Tentative Scoring Guide for the Mother Goose Problems Test. Athens, Ga.: Georgia Studies of Creative Behavior, College of Education, University of Georgia, 1967 (mimeographed).

Torrance, E. P., Fortson, Laura, R., and Diener, Carolyn. Creative-Aesthetic Ways of Developing Intellectual Skills among Five-Year-Olds. Journal of Research and Development in Education, 1968, 1(3), 58-69. Athens, Ga.: University of Georgia, College of Education.