A Study of the Varying Degrees of Creativity Manifested by Kindergarten Children from Open or Traditional Classrooms

Susan Spelman Lewis

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A STUDY OF THE VARYING DEGREES OF CREATIVITY MANIFESTED BY KINDERGARTEN CHILDREN FROM OPEN OR TRADITIONAL CLASSROOMS

by

Susan Spelman Lewis

A Thesis Submitted to the Faculty of the Graduate College in partial fulfillment of the requirements for the Degree of Master of Arts Department of Education and Professional Development

Western Michigan University Kalamazoo, Michigan December 1980
A STUDY OF THE VARYING DEGREES OF CREATIVITY MANIFESTED BY KINDERGARTEN CHILDREN FROM OPEN OR TRADITIONAL CLASSROOMS

Susan Spelman Lewis, M.A.
Western Michigan University, 1980

Visual and verbal techniques derived from Wallach and Kogan's test of creative thinking abilities (1965) were administered to fifty-seven Title I kindergarten children from four different kindergarten settings in an attempt to assess the impact of open versus non-open situations on children's creativity. Classroom populations were similar socioeconomically, racially, and with regard to the student-teacher ratio. Kindergartens were chosen in order to test young children not influenced by other school situations. The degree of classroom openness was determined using Evans' Classroom Rating Scale (1971).

Creativity scores varied positively with the degree of classroom openness. Differences among the mean scores of the four groups were significant at less than the .01 level on seven of eight measures of creative thought. No significant difference was found for sex or race.

This study supports the contention that open classrooms are more conducive than are non-open classrooms for nurturing creative behavior in kindergarten children.
ACKNOWLEDGEMENTS

I would like to thank the Teacher Corps Project at Western Michigan University for its financial support of my studies in education. I am grateful to the Grand Rapids Board of Education for allowing me to enter the classrooms, to interview teachers, and to spend a great deal of time with the children of those classrooms. I am indebted to the individual teachers and children involved in this study for their interest, openness, and support. My thanks go to Dr. Dorothy Bladt, Dr. James Bosco, and Dr. Rachel Inselberg for their time and suggestions. I would like to thank Dr. Mary A. Cain, advisor, teacher, and friend, for her trust, knowledge, and belief in me, in children, and in educational excellence. Finally, I would like to thank my parents, family and husband for their love and support.

Susan Spelman Lewis
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CHAPTER I

BACKGROUND OF THE PROBLEM

Introduction

This study arises from a concern for the nurture of children's creativity, and from questions regarding the school practices which most effectively enhance children's originality, flexibility, and liveliness of mind. Recent advocacy of the so-called "open classroom" and increasing attention to British primary schools, have suggested that practices found in such classrooms are more nurturant of creativity than are traditional classrooms. This study looks at the children of traditional and more open kindergartens in an attempt to determine if, indeed, there are significant differences in traits of creativity.

Divergent and Convergent Thought

Our society places a great emphasis on intelligence. In a nation ruled by and for the people, the development of capable thinkers is essential. Tests are given and assessments are made to insure that as a nation we are rearing competent and intelligent individuals. Yet, as Guilford (1959) points out, thinking has more than one dimension. Convergent thinking is defined as the generation of established facts and the search for a single right and best answer. Divergent thinking, on the other hand, is defined as creative, and is not bound by set standards, rules, or stimuli. Divergent thinking
allows freedom to explore and to go off on tangents through the association of thoughts. There is a spontaneous search for new and unique ideas. Anderson (1962, p.9) implies that convergent thinking typifies a closed system: "It is concerned mainly with acquiring a body of knowledge, memorizing of facts and with finding answers to problems, all of which are already known by somebody else." Divergent thinking is open to personal stimulation and accepts unique perceptions and new answers.

"Practically all intelligence tests, ability tests, and achievement tests measure closed system performance" (Anderson, 1962, p.6), or convergent thought. Tests of this kind measure intellectual competence but do not predict productive, original, or inventive performance. Something other than an I.Q. score of 140 is necessary for the production of unique and flexible ideas. It is this something that we label "creativity".

In today's complex and ever-changing world, educators must attempt to develop creative thinkers, unafraid of questioning authority, and armed with the skills and knowledge to solve tomorrow's complex problems.

Characteristics of Creative People

People who create demonstrate divergent thought. They are flexible and adaptable people who are open to new insights, experiences, and sensations. People who create are highly sensitive, conscious of their environment, aware of those around them, and are conscious of themselves. They regard pseudo-ignorance and innocence
not as bliss, but as a denial of a growing and evolving self. People who create have no tolerance for ignorance; they strive continuously to learn (Maslow, 1968, p.139).

People who create know themselves, and believe in their emotions. They enjoy solitude but are also open to others. Intimacy is not a threat to their identity, but an opportunity for growth. Both solidarity and solitude are essential to the creative person (May, 1975, p.12). The former allows an exchange of ideas, emotions, insights; the latter allows for the realization of one's own strengths and weaknesses.

The creative person is curious and is continuously questioning the hows and whys of this world. A heightened sensitivity drives the person to challenge the accepted, to find beauty in the mundane and energy in the stagnant. The creative person recognizes problems and is intrinsically motivated to confront them. Anderson calls this process a confrontation with one's world (Anderson, 1959, p.121). May describes it as an intense encounter (May, 1975, p.82).

According to Maslow, the person who creates is spontaneous and self-directed (Maslow, 1968, p.140). Although revered in his own lifetime, Michelangelo led a life of uncertainty and torment as he wrestled with himself, struggling to perfect the expression of passion he felt for the human condition. Picasso, on the other hand, is said to have been driven by his desire to play. Whether the situation is of anguish or playfulness, the motivation to create is intrinsic.
Creative Children

Children are born creating and inventing as they seek to relate with their environment. From birth, infants strive for control. Initially, their reactions are reflexive. They cry, they suck, they kick. Later, children observe that their kick has triggered another movement, a displacement of an object, a vibration, a sound. Having observed this series children will kick again and again, having learned to control and to create an order and coherence in the environment.

Infants initiate a personal and rhythmic dance with their environment, and gain a sense of synchrony between action and outcome (Seligman, 1975, p.144). Control is an incentive to interact. Consider the rattle, the mobile, or the mother's smile. It is not the physical properties of the sound, movement, or the smile that are important; it is the powerfully pleasurable phenomenon of self-initiated control (Seligman, 1975, p.170).

According to Piaget, all young children are egocentric. They are intense beings, busy exploring, interacting, and creating their own world. Such indifference to acculturation is also characteristic of the person who creates. Anderson says:

The infant starts life in a relatively open system of interacting and of freedom of interplay with his environment. It is well known that small children are curious investigators, experimenters, explorers, improvisers, inventors, open-minded and adventuresome, interested in practically everything that touches their five senses. As the child develops in ability to communicate and to extend his mobility, the environment of persons begins to close in on him. The child encounters a complicated (perhaps unnecessarily complicated) system of environmental demands, taboos, socializing and acculturating processes. These early requirements for conformity are climaxed by a school curriculum which also is mostly Closed System learning and from
which there is no escape. The environments of most children do not stimulate or even permit the continuing process of development in creativity.

It is not surprising that in early childhood creativity is universal and that among adults it is almost non-existent (Anderson, 1962, p.14).

**Traditional Schools**

Traditional schools tend to negate the creative process and to ignore the development of the concept of self. Children enter school as active agents of their own learning (Silberman, 1973, p.161) with what Rogers calls an openness to experience (Rogers, 1961, p.115).

In schools, children experience intimacy and a socializing power which is unmatched elsewhere in our society. They experience contact with and awareness of other children, yet are allowed little chance for interaction. They witness the lives around them but are forbidden to enter into meaningful exchange of thoughts, emotions, and ideas.

Traditional schools teach children to ignore those around them and, in a sense, to learn to behave as if in solitude. It is as if they must learn to be alone in a crowd (Jackson, 1968, p.16).

Non-involvement with others, however, does not constitute an involvement with self. In traditional schools, day dreaming is taboo; a child's drive to complete a task is often interrupted because it is "time to move on." Intrinsic desires to move ahead due to task completion are often ignored because "it is not yet time to stop."

In traditional schools, children act according to an external schedule. Bells, buzzers, an established curriculum objective, and
the pace of those around them determine the children's time schedules. Personal rhythm is no longer the basis by which the child operates. "There is a constant interruption of the natural flow of interest and desire" (Jackson, 1968, p.16).

According to Jackson, learning to make it in school involves, in part, learning to falsify one's behavior (Jackson, 1968, p.16). Children must, perforce, ignore their own desires, and comply with the desires of a system. If they are bored, excited, or tired, children must ignore these feelings and feign an interest in a lesson being taught. But, as Maslow says: "Anyone who tells me that my emotions or desires do not exist is in fact telling me that I do not exist." (Maslow by Samples, 1978, p.120). Traditional schools may alienate the child from the self and arrest the creative characteristic of active pursuit of learning.

The school determines a child's activities, time schedule and interaction with other people, with things and with self. Perhaps it is only fitting that the school likewise be the evaluating power. Whether it be a gold star, a smile, or a written grade, the traditional school replaces the child's intrinsic system of evaluation with external judgment from another.

Of Two Minds

To Einstein, the intuitive mind was a sacred gift, the rational mind, the faithful servant. We have begun to worship the servant and to defile the divine (Samples, 1978, p.26).
Keniston has said that in the United States:

"...we are witnessing a growing emphasis upon the child as a brain; upon the cultivation of narrowly defined cognitive skills and abilities; and above all upon the creation, through our preschools and schools, of a race of children whose value and progress are judged primarily by their capacity to do well on tests of intelligence, reading readiness, or school achievement. Although children are whole people—full of fantasies, imagination, artistic capacities, physical grace, social inclinations, cooperation, initiative, industry, love and joy—the overt, and above all, the covert structure of our system of preschools and schooling largely ignores these other human potentials in order to concentrate on cultivating a narrow form of intellect. (Keniston, 1975, p.19)."

Research indicates that the emphasis actually concentrates upon the child as half-a-brain. The brain's left cerebral hemisphere "houses the organizing, logical, conforming qualities, the rational mind" (Samples, 1978, p.18). The right cerebral hemisphere houses the metaphoric (Samples, 1978, p.19) or irrational brain which allows one to invent, to create and to challenge. Evidence of our contempt for the metaphoric brain is that "being irrational" has come to mean being senseless, unreasonable, and absurd. We value the intellectual but ignore the creative.

Getzels and Jackson have shown that high intelligence is valued in our schools while high creativity is not (Getzels and Jackson, 1962, p.30). Torrance reported that high-I.Q. students are better known by their teachers and are considered more desirable as pupils than are highly creative subjects (Torrance, 1974). Are we doomed to stifle the creative? Alternatives do exist.

Open Schools

The open school is an activity-centered school which differs from the traditional school. Based on respect for child autonomy and
and creative growth, the open school situation was designed to encourage independent thought and activity. Here, the teacher's role is to meet each child's needs and to structure environments sufficiently challenging to growth for each child.

The primary assumption governing the open classroom is that children want to learn and do so through the natural need to create and to explore. The teacher is present to enhance, to enrich, and to suggest ways which allow each child to master and to understand the environment.

In the open school, the teacher must be ready to meet each student at his or her own level of competence and interest. There is no pre-conceived curriculum. Books and materials are sometimes commercial, sometimes teacher-made, often child-made. Materials reflect individual interests and needs of the children.

Space is valued in the open school and must be put to the best possible use. Learning is active and requires floor space, wall space, writing space and sorting, counting and measuring space. Rooms change physically according to need. Desks are often pushed back or replaced altogether. Children are encouraged to move about freely and to share ideas and perceptions with the teacher and other students.

Time schedules change with the needs and desires of teachers and students. Grades are rarely used. Instead, in the open schools, the teachers are required to keep ongoing and personal records of each child's interests, successes and difficulties.

Much emphasis is placed on the nurturing of an intrinsic system of evaluation by the development of open communication between student
and teacher and by encouragement of self-evaluation. Failure is not an element of the open school. Perseverance is. Mistakes are a part of the learning process and are recognized as stimuli to growth.

The concept of the open school suggests opening knowledge to children while calling upon their potential, within a setting designed to fit individual children's needs, interests, and competencies. The implication, then, is that open schools support individual strengths and self-expression, thereby nurturing creativity.

Table I illustrates the characteristics of traditional and open schools as they relate to the characteristics of creativity. (See Table I, pp. 10-11).

Table I suggests that the open school is better suited for the nurturing of creativity than is the traditional school. This study looks at creativity in kindergarten children to determine if, indeed, children in open classrooms display creative behavior significantly more than do those in traditional classrooms.
Table I

Characteristics of Open and Traditional Schools
Vis-a-Vis Creativity

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<th>Characteristics of Creativity</th>
<th>Traditional Schools</th>
<th>Open Schools</th>
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<tbody>
<tr>
<td>Divergent thought</td>
<td>Emphasis on convergent thought patterns, acquisition of facts</td>
<td>Emphasis on divergent thought through nurturance of problem-solving process, discovery and invention</td>
</tr>
<tr>
<td>Individuality</td>
<td>Children work simultaneously at same lesson to complete established curriculum</td>
<td>Children work both in groups and independently on individual projects relevant to their interests. Many different activities occur simultaneously</td>
</tr>
<tr>
<td>Problem-centered motivation</td>
<td>Curriculum governed by authority and tradition</td>
<td>Curriculum varies according to a child's needs, interests, and abilities</td>
</tr>
<tr>
<td>Playfulness</td>
<td>Restricted time for play, recess offered as release time. Play and learning seen as antithetical</td>
<td>Play is central activity, regarded as natural, in which children explore, invent, express themselves</td>
</tr>
<tr>
<td>Internal evaluation</td>
<td>Children work for grades, stars and other external indicators of success</td>
<td>Much emphasis placed on development of intrinsic evaluation</td>
</tr>
<tr>
<td>Expression and communication of ideas and feeling</td>
<td>Except for specific times, children are expected to work silently and alone</td>
<td>Active interchange is valued in written form, projects, dance, art and music</td>
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<tr>
<td>Temporal flexibility</td>
<td>Inflexible time schedules</td>
<td>Children work according to internal time schedules</td>
</tr>
<tr>
<td>Challenge to tradition and authority</td>
<td>Children are expected to obey authority without question</td>
<td>Children are encouraged to ask why, to challenge facts, to demand and produce reasons for rules. Children are entitled to reasonable explanations</td>
</tr>
<tr>
<td>Active learning</td>
<td>Learning is the passive reception of knowledge</td>
<td>Activity is a major characteristic and is respected for its potential for learning</td>
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CHAPTER II

REVIEW OF LITERATURE

Open and Traditional Schools

Since the Plowden Report (Central Advisory Council for Education in England, 1967) first appeared, educational reformers on both sides of the Atlantic have looked to the open school as a replacement for the traditional. Rogers (1970) returned from Great Britain urging the adoption of those features which we have described as characteristic of open education.

Others advocating the adoption of the open school include Barth (1971), Dennison (1969), Featherstone (1967, 1971), Kohl (1970) Rathbone (1971) and Silberman (1973). Yet, according to Ward and Barcher (1975) and to Katz (1972), much of the evaluation of open schools has come from personal testimony not supported by scientific evaluation. Klass and Hodge (1978) argue that there are few objective investigations dealing with the advantages and disadvantages of the open school. According to Blumenthal and Reiss (1975), Minuchin and others (1969), and Wilson, Stuckey and Langevin (1972), results of studies examining the impact of open schools are inconsistent.

Franks, Marolla and Dillon (1974) used competency-based measures to find significantly higher self-esteem scores among children in open than in traditional schools. But no significant difference in self-esteem scores between the two types of schools was found by Ruedi and West (1973), by Allen (1974), by Wright (1975), or by Klass and Hodge (1978).
The assumption that all children will experience some degree of success in open situations led Sobel and Tejirian (1973) to conclude that the child's attitude toward school and future learning would be more positive in open schools than in traditional schools. Likewise, Tuckman, Cochran and Travers (1974), found children in open schools to hold more favorable attitudes toward schools than did children in traditional schools. However, these authors could only speculate as to the positive effects attitude might have on performance.

In testing creativity in second graders in traditional and open classrooms, Forman and McKinney (1978) found no significant difference in scores of either fluency or uniqueness of associated response. They found, however, that students in traditional classrooms scored higher than those in open school rooms in measurements of vocabulary, reading and mathematical achievement. Haddon and Lytton (1968) found that open school children scored higher on divergent thinking tasks than did children from traditional schools. These differences were maintained in a four-year follow-up study. Haddon and Lytton (1968) and Wilson, Stuckey and Langevin (1972) found that eleven- and twelve-year-olds who had been part of an open school program for six years were superior both to students who had recently begun in an open school program and to children in traditional schools. Yet Wright (1975) found no difference among fifth- and sixth-graders in open and traditional schools.

Ramey and Piper (1974) found that open school children scored higher on tests of figural creativity, while traditional school children scored significantly higher on verbal creativity. In a study of
low- and high-I.Q. children in open and traditional schools, Ward and Barcher (1975) found that it was in the traditional schools that high-I.Q. children scored better in tests of figural creativity. They found no difference between scores of low-I.Q. children in verbal and figural techniques.

Barth (1971) suggests that the great discrepancies in the findings dealing with open schools are due to the ambiguity of the word "open". Lukasevich and Gray (1978) reviewed fifty-seven studies dealing with open and non-open schools and their effect on students. They found nineteen studies favoring the open schools, eleven studies favoring the non-open schools, and twenty-seven studies with no significant difference in pupil outcomes from open and non-open situations. These authors suggest that one reason for the difference in test results is that the studies failed to differentiate between the schools that were physically open but operating under a closed curriculum, or physically open operating under an open curriculum, or physically closed operating under an open curriculum. The term "open" has lost its meaning.

Even if the definition of "openness" is agreed upon, there are other factors to consider. Packard (1973) questions the readiness and ability of children to make constructive use of the freedom of the open school. He challenges the assumption that all children come to school highly motivated to learn.

Bell and Aftanas (1972) and Ilg and Ames (1964) have shown that children often fail to use time constructively in open-school situations. Packard (1973) suggests that requisite skills must be taught
to children expected to be self-motivated. These studies deal with the introduction of the open classroom to children already acculturated to the traditional situation. Because the children of these studies have been influenced by both school situations, the validity of the results is questionable.

Haddon and Lytton (1968) postulated that, since school is only one factor in the development of the child's personality, measurable differences would probably not be found in elementary schools, at least until the later grades. Research in later grades has its own difficulties, since the researcher often lacks knowledge of children's previous school experience. A child in the seventh grade cannot be considered a product of an open school if six of the previous years have been spent in a traditional school environment; the reverse is equally true. It seems reasonable to suggest that, in order to obtain valid test results, researchers should agree upon an operational definition of "openness" and consider the effects of each child's school history in order to avoid contamination by previous school experience.

In summary, a review of the literature shows that to date, the assessments of the effects of open classrooms are highly contradictory. There is need for more research with greater constraints upon definitions and upon selections of subjects.

Research on Creativity

Research concerning creativity is also influenced by definition. Guilford (1959), Getzels and Jackson (1962), and Torrance (1962) recognized that intelligence tests were inappropriate measures of
creative thinking ability. They developed new tests designed to measure creative response. The majority of these tests were given under temporal constraints and administered to large groups of students in "test-like" situations. Wallach and Kogan (1965) demonstrated that such testing conditions hindered the production of creative responses, and devised their own assessment of creativity. Given in a relaxed atmosphere, free of temporal restraints or the pressure of being tested with others, the Wallach and Kogan test scores showed that creativity can be measured separately from I.Q. Their questions allow freedom of association of response. Wallach and Kogan observe the number and uniqueness of generated responses as measurements of creative thinking ability.

The present study examines the creative responses of four-, five- and six-year-olds in four school settings in an attempt to assess the effects of classroom settings on children's creative thinking abilities. The experimental hypothesis of the study assumes that there will be a significant difference in the mean degree of creativity demonstrated by a class of children depending upon the class type. Specifically, the study speculates that there will be a positive association between the degree of openness of a kindergarten classroom and the degree of creativity demonstrated by the children of those classrooms.
CHAPTER III

METODOLOGY

Null Hypothesis

The null hypothesis contends that there will be no relationship between the degree of openness exhibited by a kindergarten classroom and the degree of creativity shown by the children of that classroom.

Definitions

Creative thinking is defined as the use of divergent thinking and the forming of associative elements into new combinations. Creative thinking is characterized by the production of novel ideas, and the ability to invent, the courage to revise the known, and the willingness to take risks. In this study, creativity is assessed by using three techniques developed by Wallach and Kogan to observe the total number of associational responses generated by a child and the uniqueness of those responses (Wallach and Kogan, 1965).

Open Classroom is also called "the integrated day" classroom, activity-centered learning classroom, and the "Leicestershire" classroom (Gross, 1972, p.9). The rooms are highly individualized but operate on four major premises:

First, the room itself is decentralized; an open, flexible space divided in flexible areas rather than one fixed, homogeneous unit. Second, the children are free for much of the time to explore this room, individually or in groups, and to choose their own activities. Third, the environment is rich in learning resources, including plenty of concrete materials as well as books and other media. Fourth, the teacher and her aide work most of the time with individual children or with two or three, hardly ever presenting the same material to the class as a whole. (Gross, 1972, p.8)
The extent of openness was measured by an observation rating scale from *Characteristics of Open Education* developed for the United States Office of Education (Evans 1971).

**Title I Schools** are schools with a high concentration of families of low income status. Due to the special needs of low income children these schools receive additional financial assistance.

**Permission**

Permission to carry out this study was granted by the Office of Curriculum, Planning, and Evaluation and by the Elementary School Office of Grand Rapids, Michigan. In addition, each classroom teacher (with the support of each of their principals) voluntarily agreed to take part in a study which looked at creativity. No mention of the open or traditional classroom was made to the teachers.

**Population**

The population of this study consisted of fifty-seven Title I kindergarten children in Grand Rapids, Michigan. The subjects were Grand Rapids children (four, five, and six years of age) who had been in regular attendance in one of four kindergartens for at least six months of the year, and who attended kindergarten in the morning. Distribution of the sex and mean age of the subjects is shown in Table II. Table III shows the racial makeup of the classes (p.19).

Kindergarten children were chosen in order to observe a population most likely to be uncontaminated by school systems other than the one which they were attending at the time of the study.
Table II

Class Size, Sex Distribution, and Mean Ages of Subjects

<table>
<thead>
<tr>
<th>School</th>
<th>Girls</th>
<th>Boys</th>
<th>Mean Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7</td>
<td>5</td>
<td>5.8 yrs.</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>6</td>
<td>6.0 yrs.</td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>9</td>
<td>6.0 yrs.</td>
</tr>
<tr>
<td>D</td>
<td>8</td>
<td>12</td>
<td>5.9 yrs.</td>
</tr>
</tbody>
</table>

Table III

Racial Composition of the Samples

<table>
<thead>
<tr>
<th>School</th>
<th>Caucasian</th>
<th>Non-Caucasian</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92%</td>
<td>8%</td>
</tr>
<tr>
<td>B</td>
<td>64%</td>
<td>36%</td>
</tr>
<tr>
<td>C</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>D</td>
<td>95%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Furthermore, as stated earlier, although healthy pre-schoolers are constantly naturally creating, school children have often lost the creative drive. The present study was designed to examine children at their earliest exposure to the school system in order to assess if any measurable differences could be detected after less than one year's exposure to the school institution. This study challenges the Haddon and Lytton Report (1968) which states that measurable differences would not be found in children in the early elementary years because school is only one factor in their development of personality. Five-year old children are assumed to be highly susceptible to the impact of schools.

Four classrooms were selected from the Grand Rapids system. Classrooms A and B are recently developed Child Development Centers designed to be "open classroom situations". Classrooms C and D are traditional kindergartens, chosen for their comparable class size and the racial and socio-economic backgrounds of the children.

Physical Settings

Classrooms A and B

Each child development center has five main areas, all open to one another to provide freedom of movement and sight. The five areas are for eating, gross motor activity, sensory awareness, language development and cognitive development. They are structured so that teachers can introduce concepts, invite interactions, and facilitate growth, yet step back to allow for maximum independence of child activity. Each center has also an adjoining teacher's office. School A has three small rooms offering a quiet setting.
Activity tables replace individual desks. Each child has a personal drawer and coat space, but most space "belongs" to all. An abundance of manipulative materials (many of them teacher-made)—paints, crayons, papers, and objects to sort and categorize—are available. Reading and picture books are within easy access of the children.

Each child development center serves eighty children each morning. Kindergarten children are involved in activities with children enrolled as Headstart or pre-kindergarten children, in accord with the philosophy that interaction with children of varying ages is healthy. Children learn from one another and progress according to a personal rather than an extrinsic time schedule. Each child development center has four teachers and four aides, creating a teacher-student ratio of one to twenty, and with an adult-student ratio of one to ten.

Classroom C

Classroom C is a large room with a coat room, meeting room, and bathroom. The children sit at desks placed in "U-formation", allowing the teacher space to conduct her lessons in the center of the U while keeping close proximity to each of the children. For the most part, the class works as a group following teacher-directed lessons. Occasionally, the children are invited to work together or alone at several mathematical activities. The teacher makes use of commercial reading, handwriting, and arithmetic workbooks from which the daily lessons are derived. The classroom has many reading and picture books
which seem readily available for students' use. In addition to the commercial products, there are many teacher-made manipulative materials. A student teacher was in Classroom C for the last few weeks of the year. In general, however, the classroom teacher is alone with her students. The teacher-student ratio at the time of the study was one to fourteen.

Classroom D

Classroom D is a bright, self-contained classroom. Each child has his or her own desk. The desks are placed together in groups of eight. Lessons are presented to the class as a group. Children's art work is hung about the room. Smiling green and purple frog paintings, collages, and mosaics are abundant. There are few books. There are some teacher-made materials for individual lesson reinforcement, but no use of these materials was observed during the testing period.

The teacher has a half-time morning aide. Thus the teacher-student ratio was one to twenty for one half of the morning; the adult-student ratio was one to ten.

PROCEDURE

Procedure consisted of two parts: the observations of classrooms using the openness scales, and the administration of creativity tests.
Observation of Classrooms

The study necessitated an operational definition of "open" and an easy-to-use scale of openness. Classrooms were rated on their degree of openness according to the Classroom Observation Rating Scale found in Characteristics of Open Education devised by Judith T. Evans, 1971 (see Appendix A). This scale demands that the observer rank the classrooms on a four-point scale for fifty items. A rating of "four" indicates that a characteristic was observed frequently; "three" indicates moderate evidence; "two" indicates that a characteristic was observed, though infrequently; and "one" indicates that there was no evidence of that characteristic.

Evans (1971, p.6) used eight dimensions as indicators of an open classroom environment.

1) **Provisions for learning**: flexibility in the organization of instruction and materials.

2) **Diagnosis**: less attention to goals such as examination scores, and more attention to a child's thinking process.

3) **Instruction**: much individual attention rather than solely total class instruction, encouragement of children's initiative and choice, interdisciplinary emphasis.

4) **Evaluation** of individual standards or goals preferred to comparing the class standardized achievement norms. Record-keeping often done in order to evaluate growth rather than correctness.

5) **Humaneness**: teachers have characteristics such as respect for children, openness and warmth.
6) **Opportunities to promote growth:** teachers engage in extensive use of community, colleagues, advisors.

7) **Assumptions:** ideas about children and their process of learning. Emphasis is placed on a child's curiosity, respect for ontological growth, trust in children's ability to make decisions.

8) **Self-perception of the teacher:** a sensitive, adaptable, continual learner who sees himself/herself as a resource for helping children reach their own potential, rather than as a disseminator of a given body of knowledge. (Assessment of self-perception is made through an informal interview with the teacher.)

The use of this Evans observation scale allowed the observer to define concretely in what ways a school was or was not open. Use of the scales allows for replication of the study.

**Administration of Creativity Tests**

Three techniques developed by Wallach and Kogan (1965) were used to measure creative thinking. Wallach and Kogan's tests require an environment that is relaxed and as gamelike as possible. There is no temporal restrictions. The test measures the total number of associative responses and the uniqueness of these responses generated by various stimuli.

Wallach and Kogan's original creative thinking instrument includes five techniques. This study eliminated two of the five techniques, both of them verbal items, for the following reasons:

1) the population of this study was much younger than that of the Wallach and Kogan study, and many of the children lacked the requisite
verbal comprehension for two of the three verbal techniques.

2) Wallach and Kogan found the interrelationship among all five of their creative measures to be quite high. Ten reliability measures showed a split-half reliability coefficient of .50 or better. Eight of the ten measures scored .80 reliability. It was not felt that the deletion of two verbal techniques would in any significant way affect the test results.

Techniques Used

The following procedures from Wallach and Kogan were used to test creativity:

1) The Instances Technique (verbal)
2) The Pattern Meanings Technique (visual)
3) The Line Meaning Technique (visual)

The Instances Technique

The Instances Technique is introduced in this way:

    I have a game that I have been playing with kindergarten children all over Grand Rapids. Would you like to play with me? Good. The rules are very simple. I am going to say some things and I want you to tell me as many answers as you can think of to the questions. OK? If I were to say, "Name something white", what would you say?

    The tester waits for the child to respond, praises the answer, and then says: "Great!" Being careful not to repeat an answer given by the child, the tester adds:

    You might also have said the white part of your eyeball, your teeth, a polar bear, or snowflakes! You might have said the pages of a book, mashed potatoes, the petal of a

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flower or vanilla ice cream. You can be as serious or as silly as you like. The idea is to give me as many different answers as you can. I am going to write down your answers. When you are all finished and you cannot think of any more answers, say: "Let's go on!", and I'll know that you are ready for a new question.

An important element in the test situation is that each child determines the needed amount of time to complete the response. Wallach and Kogan hold that if a test of creative thought is to be valid, "the procedural context must provide for temporal flexibility" (Wallach and Kogan, 1965, p.18). Earlier tests of creativity operated on strict time schedules. Wallach and Kogan pointed out that most people will initially give stereotypic responses and that unique responses are often generated after the stereotypic responses have been given (Wallach and Kogan, 1965, p.17). Thus, a short time span limits creative performance, and is therefore inappropriate to assessing creativity. In this procedure, each child decided upon the appropriate amount of time needed:

Stimuli in the Instances Procedure are:

1) Name as many round things as you can think of.
2) Name as many things as you can think of that make noise.
3) Name as many square things as you can think of.
4) Name as many things as you can think of that move on wheels.

All answers are recorded verbatim.

At the completion of the Instances Procedure, the first of the two visual procedures is administered.
The Pattern Meanings Procedure

The Pattern Meanings Procedure was introduced in this way:

Here is a game where you can really feel free to use your imagination. In this game, I am going to show you some drawings. After looking at each one, I want you to tell me all the things that you think a complete drawing could be. Here is an example. You can turn it any way you wish.

The tester shows the example card to a child and encourages the child to tell what it might be. The child responds. The tester reinforces the child's answers and then suggests other examples, such as a rising sun, a flower bursting, or a porcupine. The child then gives additional responses. When the child has finished, the tester says:

Good, I can see that you know how to play this game already. I'll show you a card and you can tell me all the answers that you can. When you are finished with one card, say: "Let's go on", and I'll know that you are ready for a new card. Let's begin!

Eight 8" x 12" cards are used. The patterns are shown below:

Each card was handed individually to the child with the statement "Here is another drawing. Look at the whole picture and tell me all the things you think this might be".
At the completion of the Pattern Meaning Procedure, the tester administered the Line Meaning Procedure.

The Line Meaning Procedure

Instructions are very similar to those of the Pattern Meaning Procedure. Each card, containing a continuous-line pattern, is handed to the child with these instructions:

This game is called the Line Game. I want you to take each card, turn it as you like and tell me as many things as you can imagine the whole line to be. Here is the first. What could it be?

The nine cards are shown below:

At the Completion of the Line Meaning Procedure, the tester thanked each child for helping to play the game.

The time of administration varied from twenty-five to fifty-five minutes, depending on the individual child.
CHAPTER IV

RESULTS

Results of the Classroom Observation Rating Scale

Openness scores for each of the four schools are listed in Table IV. Each of the fifty items of the observation survey is rated on a four-point scale. A score of four points indicates that the characteristic of the open classroom was observed frequently. Three points indicates that the characteristic was in moderate evidence; two points shows weak evidence of a characteristic, and one point means that there was no evidence of the characteristic. The possible range of scores, then, was from fifty to two-hundred points. (See Appendix B for scoring of individual items).

Table IV

Scores of Openness of the Kindergarten Settings

<table>
<thead>
<tr>
<th>School</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>178</td>
</tr>
<tr>
<td>B</td>
<td>166</td>
</tr>
<tr>
<td>C</td>
<td>86</td>
</tr>
<tr>
<td>D</td>
<td>79</td>
</tr>
</tbody>
</table>

Schools A and B (the Child Development Centers) received 29
considerably higher scores than did Schools C and D, which have been
designated as the traditional schools.

Results of the Tests of Creative Thinking

Each of the three procedures used to measure creative thought,
the Instances Procedure, the Pattern Meaning Procedure, and the Line
Meaning Procedure, was scored according to two dimensions of creative
thought: uniqueness and fluency of response.

Fluency of Responses

The mean scores for fluency of responses are given in Table V.

Table V

Mean Scores: Fluency of Responses

<table>
<thead>
<tr>
<th>Procedure</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instances</td>
<td>36.12</td>
<td>30.00</td>
<td>22.93</td>
<td>19.00</td>
</tr>
<tr>
<td>Pattern</td>
<td>24.92</td>
<td>22.45</td>
<td>18.50</td>
<td>16.40</td>
</tr>
<tr>
<td>Line</td>
<td>26.63</td>
<td>25.00</td>
<td>18.93</td>
<td>14.50</td>
</tr>
<tr>
<td>Total</td>
<td>87.67</td>
<td>77.45</td>
<td>60.36</td>
<td>49.90</td>
</tr>
</tbody>
</table>

In every measure of fluency of association, the mean score rose with
the openness of the classroom. Table VI presents results from the
analyses of variance of the fluency scores.
Differences among mean class creativity scores were significant at less than the .01 level in three of the four measurements of creative response. The mean scores of fluency reveal that children from open classrooms generated a greater number of associations on Wallach and Kogan's tests of verbal and visual stimuli than did children from more traditional classrooms. The scores are significantly different in three of the four measurements of fluency.

Table VI

Summary of Analysis of Variance of Fluency Scores

<table>
<thead>
<tr>
<th>Procedure</th>
<th>F Ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instances</td>
<td>4.746</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Pattern</td>
<td>2.67</td>
<td>N.S.</td>
</tr>
<tr>
<td>Line</td>
<td>6.486</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Total</td>
<td>5.88</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>

Uniqueness of Response

Each appropriate unique answer is given a score of one. Unique answers are those given by only one of the fifty-seven kindergarten subjects. Table VII gives the mean scores of uniqueness of responses to the Wallach and Kogan test.
Table VII

Mean Scores of Uniqueness of Response

<table>
<thead>
<tr>
<th>Procedure</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instances</td>
<td>8.75</td>
<td>7.36</td>
<td>1.71</td>
<td>1.25</td>
</tr>
<tr>
<td>Pattern</td>
<td>7.66</td>
<td>4.73</td>
<td>2.71</td>
<td>1.35</td>
</tr>
<tr>
<td>Line</td>
<td>8.08</td>
<td>3.36</td>
<td>3.14</td>
<td>1.25</td>
</tr>
<tr>
<td>Total</td>
<td>24.5</td>
<td>15.55</td>
<td>7.57</td>
<td>3.85</td>
</tr>
</tbody>
</table>

Again, without exception, higher creativity scores were associated with greater openness of classrooms. The more open the school setting, the more novel were the answers given by the children.

Table VIII contains the results of the analysis of variance of the uniqueness scores.

Table VIII

Summary of Analysis of Variance of Uniqueness Scores

<table>
<thead>
<tr>
<th>Procedure</th>
<th>F Ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instances</td>
<td>6.75004</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Pattern</td>
<td>6.709</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Line</td>
<td>5.97</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Total</td>
<td>10.340</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>
The analysis of variance of uniqueness scores shows that the difference is significant at the less than .01 level among each of the four measurements.

In summary, in all eight measurements of creativity, there was a positive association between the degree of openness observed in the classroom and the mean creativity scores demonstrated by the children. Simply, the more open the school setting, the more creative the children. Differences were significant in seven of the eight measurements.

The scores are graphed in Figures 1, 2 and 3. Mean scores of openness are illustrated in Figure 1. Figures 2 and 3 show the mean scores of the creativity tests for fluency and uniqueness. It is obvious that the general pattern of scores of creativity is mirrored by the evaluation of each school's degree of openness. In every case, School A obtains the highest score, followed by Schools B, C, and D, in that order. There is a positive association between the degree of openness of a school and the degree of creativity demonstrated by the children of that school.

Other Variables

This study shows a positive relationship between the degree of openness of a classroom and the degree of creativity demonstrated by its children. The variables of sex and race were assessed through comparison of mean scores of boys and girls and of Caucasian and non-Caucasian children. Table IX compares the mean scores on the creativity tests for boys and girls (p.36).
Scores of Openness

Figure 1.

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Figure 2.

Figure 3.

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Table IX

Mean Scores for Fluency and Uniqueness for Boys and Girls

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th>Girls</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency of Response</td>
<td>59.53</td>
<td>79.48</td>
<td>1.82</td>
<td>N.S.</td>
</tr>
<tr>
<td>Uniqueness of Response</td>
<td>10.94</td>
<td>11.92</td>
<td>.284</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Table X presents the mean creativity scores for Caucasian and non-Caucasian children.

Table X

Mean Scores in Fluency and Uniqueness for Caucasian and Non-Caucasian Children

<table>
<thead>
<tr>
<th></th>
<th>Caucasian</th>
<th>Non-Caucasian</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency of Response</td>
<td>65.54</td>
<td>68.84</td>
<td>.256</td>
<td>N.S.</td>
</tr>
<tr>
<td>Uniqueness of Response</td>
<td>11.43</td>
<td>11.00</td>
<td>.102</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

No significant difference was found by sex or by race, demonstrating that in this study, neither sex nor race functioned as variables affecting creative performance.
Examples of Response

To illustrate scoring procedures and variation in responses, examples of children's answers have been included. Table XI lists examples of typical and unique responses to the Instances Procedure.

Table XI

Examples of Typical and Unique Responses to the Instances Procedure

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Typical Responses</th>
<th>Unique Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Things that are round</td>
<td>A cup</td>
<td>Mouth saying &quot;O&quot;</td>
</tr>
<tr>
<td></td>
<td>A circle</td>
<td>Ear muffs</td>
</tr>
<tr>
<td></td>
<td>A plate</td>
<td>Ends of a rug rolled up</td>
</tr>
<tr>
<td>Things that make noise</td>
<td>Yelling</td>
<td>Strawberries dropping in soft ice cream</td>
</tr>
<tr>
<td></td>
<td>A TV</td>
<td>Person stung by a bee</td>
</tr>
<tr>
<td></td>
<td>A dog</td>
<td>Stove when it splatters stuff</td>
</tr>
<tr>
<td>Things that are square</td>
<td>Paper</td>
<td>Shirtsleeves folded</td>
</tr>
<tr>
<td></td>
<td>A Window</td>
<td>The principal's suitcase</td>
</tr>
<tr>
<td></td>
<td>A box</td>
<td>where he carries papers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A jack-in-the-box</td>
</tr>
<tr>
<td>Things that move on wheels</td>
<td>Cars</td>
<td>Couches</td>
</tr>
<tr>
<td></td>
<td>Big wheels</td>
<td>Clown on skates</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>A pretend cookie jar that</td>
</tr>
<tr>
<td></td>
<td></td>
<td>would come when I call</td>
</tr>
</tbody>
</table>

To assure valid responses, Wallach and Kogan include a "no-score" procedure for any inappropriate answer—that is, for responses which, while they may be unique, bear no relationship to the stimulus or show no originality. One subject of the present study made a
"no-score" response. Presented with the stimulus of a square, the child answered, "A circle because it is round." Except for this example, inappropriate or bizarre answers did not occur.

In order to illustrate scoring methods and the variation among responses from the four kindergarten settings, Table XII lists all responses of one child from each setting to the stimulus "things that make noise" (Instances Procedure). The most fluid list of responses was chosen from each classroom. Answers followed by an asterisk were also scored as unique.


Note that, although fluency of total response and the uniqueness of a response are all that are directly scored, elaboration also plays a factor in the production of creative responses. Wallach and Kogan's test measures elaboration indirectly. For instance, the child in School A listed people walking as a response to things that make noise. She received a score of one for fluency, yet nothing for uniqueness. The child in School B said 1) walking with high heels and 2) walking up the stairs. This child's answers were more elaborate. The exact answer was not replicated and the child received two points for fluency and two points for unique responses.
**TABLE XII**

Responses to the Stimulus, "Things That Make Noise"

<table>
<thead>
<tr>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) dog</td>
<td>1) records</td>
<td>1) music</td>
<td>1) birds</td>
</tr>
<tr>
<td>2) car</td>
<td>2) song</td>
<td>2) piano</td>
<td>2) rain</td>
</tr>
<tr>
<td>3) birds</td>
<td>3) hammering</td>
<td>3) drums</td>
<td>3) TV</td>
</tr>
<tr>
<td>4) lights when they click</td>
<td>4) taking chairs down*</td>
<td>4) clapping</td>
<td>4) radio</td>
</tr>
<tr>
<td>5) door when somebody slams it*</td>
<td>5) dropping a ball</td>
<td>5) baby crying</td>
<td>5) owl</td>
</tr>
<tr>
<td>6) balloon when you blow it up*</td>
<td>6) crying</td>
<td>6) people yelling</td>
<td>6) bear</td>
</tr>
<tr>
<td>7) wind</td>
<td>7) talking</td>
<td>7) thunder</td>
<td>7) clock</td>
</tr>
<tr>
<td>8) rain</td>
<td>8) crying</td>
<td>8) lightning</td>
<td>8) when you walk upstairs*</td>
</tr>
<tr>
<td>9) people walking</td>
<td>9) throwing dishes down*</td>
<td>9) people crying</td>
<td>9) cars</td>
</tr>
<tr>
<td>10) a record player's needle scratching*</td>
<td>10) radio</td>
<td>10) zippers when they get stuck*</td>
<td>10) motorcycles</td>
</tr>
<tr>
<td>11) somebody hollering</td>
<td>11) breaking windows*</td>
<td>11) snaps</td>
<td>11) boat</td>
</tr>
<tr>
<td>12) river</td>
<td>12) karate</td>
<td>12) cracking fingers*</td>
<td>12) washers</td>
</tr>
<tr>
<td>13) cow</td>
<td>13) knocking pencils*</td>
<td>13) if someone falls*</td>
<td>13) water</td>
</tr>
<tr>
<td>14) fox</td>
<td>14) dropping tables*</td>
<td></td>
<td>14) when you walk upstairs*</td>
</tr>
<tr>
<td>15) lion</td>
<td>15) bikes</td>
<td></td>
<td>15) teeter-totters</td>
</tr>
<tr>
<td>16) mountain lion</td>
<td>16) motorcycles</td>
<td></td>
<td>16) piano</td>
</tr>
<tr>
<td>17) tiger</td>
<td>17) throwing rocks down*</td>
<td></td>
<td>17) slides</td>
</tr>
<tr>
<td>18) sheep</td>
<td>18) playing baseball</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19) chickens</td>
<td>19) fire crackling*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20) rooster</td>
<td>20) throwing mud*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21) horse</td>
<td>21) water running*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22) splashing in water*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23) piano</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24) guitar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25) trumpet*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
## TABLE XII
(continued)

Responses to the Stimulus, "Things That Make Noise"

<table>
<thead>
<tr>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
</tr>
</thead>
<tbody>
<tr>
<td>22) shoes</td>
<td>26) breaking light bulbs*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23) somebody singing</td>
<td>27) screaming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24) mud when you step in it*</td>
<td>28) chopping a tree*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25) a fox hollering*</td>
<td>29) bees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26) when you sit down</td>
<td>30) jumping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at a table and</td>
<td>31) running</td>
<td></td>
<td></td>
</tr>
<tr>
<td>scratch the chair*</td>
<td>32) whipping around*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27) when you drop</td>
<td>33) breaking mirrors*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>something down*</td>
<td>34) throwing garbage cans*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35) jumping on wooden slats*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>36) walking with high heels*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>37) roller skating</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>38) ice skating*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39) breaking a piano*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40) turning on a faucet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41) jumping off a board into water*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42) reading books out loud*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>43) driving a car</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>44) airplane noises</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>45) speed boat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>46) paddle boat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>47) sweeping*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>48) walking up the stairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>49) clock</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE XII
(continued)

Responses to the Stimulus, "Things That Make Noise"

<table>
<thead>
<tr>
<th>School A</th>
<th>School B</th>
<th>School C</th>
<th>School D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50) dropping a radio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51) dropping a glass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52) jumping on a chair*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53) building a house*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54) throwing bricks*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55) breaking a ladder*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Some responses are typical of one environmental situation, yet not heard at all at another location. For instance, 64% of the children in Classroom C recognized the second card as being "top line, bottom line, base line", referring to their handwriting paper. The answer was not heard in any of the other schools. Although the children had been told to name as many things as they could, silly or serious, the Classroom C children never appeared to believe that there was no correct answer. Upon seeing this card and responding, "top line, bottom line, base line", one child sighed, "Phew! At least I got that one right!" It appears he had been conditioned to believe that there was always one right answer.

Table XIII (p.43) lists typical and unique answers to the stimulus cards in the Pattern Meaning Procedure.

Examples of typical and unique responses to the Line Meaning Procedure cards are given in Table XIV (p.44).
Table XIII

Responses to the Pattern Meaning Stimulus Cards

<table>
<thead>
<tr>
<th>Card</th>
<th>Typical Responses</th>
<th>Unique Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="apple_tree.png" alt="Image" /></td>
<td>An apple tree</td>
<td>A bear climbing a pole</td>
</tr>
<tr>
<td><img src="flower.png" alt="Image" /></td>
<td>A flower</td>
<td>A skinny juggler</td>
</tr>
<tr>
<td><img src="top_dotted.png" alt="Image" /></td>
<td>Top line, dotted line</td>
<td>A skinny mouth</td>
</tr>
<tr>
<td><img src="road.png" alt="Image" /></td>
<td>A road</td>
<td>Front of a filing cabinet</td>
</tr>
<tr>
<td><img src="tires.png" alt="Image" /></td>
<td>Tires on a truck</td>
<td>Four grapes on an elephant's nose</td>
</tr>
<tr>
<td><img src="half_square.png" alt="Image" /></td>
<td>Half a square with circles</td>
<td>Candles on a birthday cake</td>
</tr>
<tr>
<td><img src="glasses.png" alt="Image" /></td>
<td>Glasses</td>
<td>Toast popping up in a toaster</td>
</tr>
<tr>
<td><img src="m.png" alt="Image" /></td>
<td>An &quot;M&quot;</td>
<td>A mouse disguise</td>
</tr>
<tr>
<td><img src="lines.png" alt="Image" /></td>
<td>Lines</td>
<td>Piano keys</td>
</tr>
<tr>
<td><img src="sticks.png" alt="Image" /></td>
<td>Sticks</td>
<td>A counting thing (abacus)</td>
</tr>
<tr>
<td><img src="two_circles.png" alt="Image" /></td>
<td>Two circles</td>
<td>A yawning mouth and nose</td>
</tr>
<tr>
<td><img src="fat_man.png" alt="Image" /></td>
<td>A fat man</td>
<td>A pregnant lady</td>
</tr>
<tr>
<td><img src="triangle.png" alt="Image" /></td>
<td>Triangle</td>
<td>A space ape</td>
</tr>
<tr>
<td><img src="bike.png" alt="Image" /></td>
<td>Bike</td>
<td>A chair with bolts</td>
</tr>
<tr>
<td><img src="ship.png" alt="Image" /></td>
<td>A ship</td>
<td>A stork</td>
</tr>
<tr>
<td><img src="flag.png" alt="Image" /></td>
<td>A flag</td>
<td>A bee flying away from a tree</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Card</th>
<th>Typical Responses</th>
<th>Unique Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Mountains] (Mountains)</td>
<td>Thunder</td>
<td></td>
</tr>
<tr>
<td>![Zig Zags] (Zig Zags)</td>
<td>A broken TV set</td>
<td></td>
</tr>
<tr>
<td>![Part of an &quot;S&quot;] (Part of an &quot;S&quot;)</td>
<td>An umbrella handle</td>
<td></td>
</tr>
<tr>
<td>![A fish hook] (A fish hook)</td>
<td>A horse's tail</td>
<td></td>
</tr>
<tr>
<td>![A string] (A string)</td>
<td>The movement a helicopter makes in the air</td>
<td>Smoke</td>
</tr>
<tr>
<td>![A mess] (A mess)</td>
<td>Where two roofs meet</td>
<td></td>
</tr>
<tr>
<td>![A line] (A line)</td>
<td>A stretched rubber band</td>
<td></td>
</tr>
<tr>
<td>![A one] (A one)</td>
<td>An angel</td>
<td></td>
</tr>
<tr>
<td>![A string] (A string)</td>
<td>A dragon</td>
<td></td>
</tr>
<tr>
<td>![A cord] (A cord)</td>
<td>Where a zebra's stripes meet</td>
<td>A clown's hat in the snow</td>
</tr>
<tr>
<td>![Part of a triangle] (Part of a triangle)</td>
<td>A &quot;V&quot;</td>
<td></td>
</tr>
<tr>
<td>![An &quot;V&quot;] (An &quot;V&quot;)</td>
<td>Scissors cutting</td>
<td>A balloon which popped</td>
</tr>
<tr>
<td>![Cursive writing] (Cursive writing)</td>
<td>String</td>
<td></td>
</tr>
<tr>
<td>![Nothing] (Nothing)</td>
<td>A mixed up worm</td>
<td>A lady's body at the swimming pool</td>
</tr>
<tr>
<td>![A &quot;U&quot;] (A &quot;U&quot;)</td>
<td>An acorn</td>
<td></td>
</tr>
<tr>
<td>![An &quot;N&quot;] (An &quot;N&quot;)</td>
<td>A fish head</td>
<td></td>
</tr>
</tbody>
</table>
Summary

Tests of creativity were administered to fifty-seven Title I kindergarten children in four kindergarten settings which differed in assessed degree of "openness". Differences among the mean scores of the four groups were found to be significant at less than the .01 level on seven of the eight measures of creativity. Creativity scores varied positively with the degree of openness of the school setting. No significant difference in test scores was found for sex or race.

Within the limitations of this study, results support the contention of open classroom advocates that classrooms defined as "open" tend to produce more creative performance in children.

Limitations

Although the findings of this study support the hypothesis that a significant and positive relationship exists between the degree of defined openness in a classroom and the degree of creativity demonstrated by the children of that classroom, any conclusion is subject to limitations.

1) Observation and assessment of the degree of openness of the classrooms, and measurement of the subjects' creativity were carried out by one examiner, allowing the possibility of bias in either assessment.
2) Although classrooms were chosen to resemble each other as closely as possible in population served, they were not identical in this respect. More significantly, the four classrooms differed in teacher-pupil ratio. Classrooms A and B had an adult-student ratio of one to ten, while Classroom C had a ratio of one to fourteen for the majority of the school year, and Classroom D had an adult-student ratio of one to ten for the first half of the school day, and one to twenty for the remainder of the day.

3) The sample was small. Only fifty-seven kindergarten children were tested.

4) While care was taken to assure a relaxed atmosphere during the administration of the creativity tests, the examiner was already known to the children in Schools A, B, and C, but was unfamiliar to the children of Classroom D.

5) Some questions on the Classroom Observation Rating Scale were ambiguous. For example, Question 40 asks whether the teacher is in charge. In every classroom visited, the teacher was in charge, and each classroom scored the maximum number of points on this question. Yet in two of the classrooms it was clear that children were in charge of many of their own activities. Because the "open classroom" has been defined in many ways, the operational definition of openness is subject to question. The results of this study must be limited in application to "openness" as defined by the observational rating scale used.

6) To adapt the Wallach and Kogan measures of creativity to kindergarten children, parts of the original instrument were deleted.
7) The children were not randomly assigned to the different classrooms, and initial statistical equivalence among the groups cannot be assumed. In addition, the ex post facto research design of the present study did not allow for the control and measurement of antecedent variables.

Discussion

This study examined the degree of creativity demonstrated by children of comparable backgrounds in different kindergarten settings. Data showed that certain kindergartens had significantly more creative children than other kindergartens. The creative kindergartens were open and receptive to children's needs, feelings, and desire to learn. Such schools are described as "open" schools; they allow children to be open to experiences, feelings, sensations and growth; they accommodate the young child's natural way of learning through exploration and play, and they allow children reasonable independence and responsibility.

A basic premise of the open school is that humankind is meant to learn and is naturally creative. This study examined very young children who are at an age where they can begin to emerge from their egocentric world into the socialized world of others. The supposition was that a population had been chosen that, before the onset of the school year, had not yet been taught conformity. It was found that the child's encounter with the schools need not be one in which children must be alienated from their intrinsic needs, desires, or from themselves. The complexities of early childhood inquisitiveness, the
liveliness of mind, the exploratory play, need not be stripped away from a young child by complex demands of a closed system of education. Rather, the characteristics of young children, which so closely parallel the characteristics of the creative adult, can be nurtured and gently directed to assure positive and creative growth.

This study examined the effects of four kindergarten settings on the degree of creativity demonstrated by their children. Although concrete conclusions can only be drawn within the parameters of the chosen population, one can speculate as to what the conclusions of the study mean to education as a whole. Assuming that humankind is born with creative potential, we have seen that creativity in children is affected by the environment of their classrooms. If six to nine months in a kindergarten setting can produce the significant differences in mean test scores which were found in this study, the long-term effects of traditional schooling may be considerable. It is not known if the effects of kindergartens are reversible or everlasting. It is suggested that children who have been allowed freedom to explore, to invent, and to follow their instincts within a structured and rich environment offered in open classrooms and under the guidance of sensitive teachers will be far ahead of their traditional school peers in positive feelings of self-esteem and in over-all creative growth. One may infer that open schools do not arrest the creative process necessary for the nurture of life-time learners. Open schools may offer the alternative situation in which creative growth may thrive.
Recommendations

Within limitations, this study demonstrated a positive relationship between the degree of openness of a kindergarten setting and the degree of creativity demonstrated by the children in that setting. There is need for more research in this area. Suggestions for further research include that the procedures of this study be used with children from other socioeconomic strata, and that they be used with older children who have spent the majority of their school years in programs that were consistently open or that were consistently traditional, allowing the researcher to examine the cumulative effect of open and traditional schools. Use of an older population would also allow the use of all of the Wallach and Kogan measures, as this population would have the requisite verbal skills.

Further, it is suggested that the procedures be used with tests to measure children's self-concepts and independence. Although more open classrooms appeared to nurture greater degrees of independence and superior concepts, these perceptions were not tested and are not substantiated.

Conclusions

The findings of this study indicate that the "open" kindergarten classroom is a viable alternative to the "traditional" kindergarten for those who value creative growth in children. There is a need for additional research to determine if the positive effects of open kindergartens found in the present study are typical of other situations. We have seen that all young children can create. Yet, creativity cannot
develop in a void. If creativity is valued, we must find ways to nurture the creative process. This study suggests that schools described as "open" make an environment suitable for creative growth.
APPENDIX A

CLASSROOM OBSERVATION RATING SCALE

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak</th>
<th>infrequent</th>
<th>moderate</th>
<th>occasional</th>
<th>strong</th>
<th>frequent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.* Texts and materials are supplied in class sets so that all children may have their own.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Each child has a space for his personal storage and the major part of the classroom is organized for common use.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.* Materials are kept out of the way until they are distributed or used under the teacher's direction.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Many different activities go on simultaneously.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.* Children are expected to do their own work without getting help from other children.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Manipulative materials are supplied in great diversity and range, with little replication.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Day is divided into large blocks of time within which children, with the teacher's help, determine their own routine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Children work individually and in small groups at various activities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Books are supplied in diversity and profusion (including reference, children's literature).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>No evidence</td>
<td>Weak</td>
<td>Infrequent</td>
<td>Moderate</td>
<td>Occasional</td>
<td>Strong</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------------------</td>
<td>-------------</td>
<td>------</td>
<td>------------</td>
<td>----------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>10.*</td>
<td>Children are not supposed to move about the room without asking permission.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.*</td>
<td>Desks are arranged so that every child can see the blackboard or teacher from his desk.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>The environment includes materials developed by the teacher.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Common environmental materials are provided.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Children may voluntarily make use of other areas of the building and school yard as part of their school time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>The program includes use of the neighborhood.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Children use &quot;books&quot; written by their classmates as part of their reading and reference materials.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.*</td>
<td>Teacher prefers that children not talk when they are supposed to be working.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Children voluntarily group and re-group themselves.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>The environment includes materials developed or supplied by the children.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.*</td>
<td>Teacher plans and schedules the children's activities through the day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
21.* Teacher makes sure children use materials only as instructed.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

22.* Teacher groups children for lessons directed at specific needs.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

23. Children work directly with manipulative materials.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

24. Children make use of materials which are self-correcting.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tbody>
</table>

25. Teacher promotes a purposeful atmosphere by expecting and enabling children to use time productively and to value their work and learning.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

26.* Teacher uses test results to group children for reading and/or math.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
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<tbody>
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<td></td>
<td>1</td>
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</tr>
</tbody>
</table>

27.* Children expect the teacher to correct all their work.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
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<tbody>
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<td>1</td>
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<td>4</td>
</tr>
</tbody>
</table>

28. Teacher bases her instruction on each individual child and his interaction with materials and equipment.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
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<td></td>
<td>1</td>
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<td>4</td>
</tr>
</tbody>
</table>

29. Teacher gives children tests to find out what they know.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
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<td></td>
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</tbody>
</table>

30. The emotional climate is warm and accepting.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
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<td></td>
<td>1</td>
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</tbody>
</table>

31.* The work children do is divided into subject matter areas.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
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<td></td>
<td>1</td>
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</tr>
</tbody>
</table>

32.* The teacher's lessons and assignments are given to the class as a whole.  

<table>
<thead>
<tr>
<th></th>
<th>no evidence</th>
<th>weak frequent</th>
<th>moderate occasional</th>
<th>strong evidence</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>33. To obtain diagnostic information, the teacher closely observes the specific work or concern of a child and asks immediate, experience based questions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>34.* Teacher bases her instruction on curriculum guides or text books for the grade level she teaches.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35. Teacher keeps notes and writes individual histories of each child's intellectual, emotional, physical development.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>36.* Teacher has children for a period of just one year.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>37. The class operates within clear guidelines made explicit.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>38. Teacher takes care of dealing with conflicts and disruptive behavior without involving group.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>39. Children's activities, products, and ideas are reflected abundantly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>40. The teacher is in charge.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>41. Before suggesting any extension or redirection of activity, teacher gives diagnostic attention to the particular child and his particular activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>42. The children spontaneously look at and discuss each other's work.</td>
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<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

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43.* Teacher uses tests to evaluate children and rate them in comparison to their peers.  

<table>
<thead>
<tr>
<th>no evidence</th>
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<th>moderate evidence</th>
<th>frequent evidence</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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</table>

44. Teacher uses the assistance of someone in a supportive, advisory capacity.  

<table>
<thead>
<tr>
<th>no evidence</th>
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<th>frequent evidence</th>
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<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

45.* Teacher tries to keep all children within her sight so that she can make sure they are doing what they are supposed to do.  

<table>
<thead>
<tr>
<th>no evidence</th>
<th>weak evidence</th>
<th>moderate evidence</th>
<th>frequent evidence</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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</table>

46. Teacher has helpful colleagues with whom he discusses teaching.  

<table>
<thead>
<tr>
<th>no evidence</th>
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<th>frequent evidence</th>
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<tbody>
<tr>
<td>1</td>
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</table>

47. Teacher keeps a collection of each child's work for use in evaluating his development.  

<table>
<thead>
<tr>
<th>no evidence</th>
<th>weak evidence</th>
<th>moderate evidence</th>
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<tbody>
<tr>
<td>1</td>
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48. Teacher views evaluation as information to guide his instruction and for provisioning the classroom.  

<table>
<thead>
<tr>
<th>no evidence</th>
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<tbody>
<tr>
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</table>

49.* Academic achievement is teacher's top priority for the children.  

<table>
<thead>
<tr>
<th>no evidence</th>
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50. Children are deeply involved in what they are doing.  

<table>
<thead>
<tr>
<th>no evidence</th>
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Questions reflecting the open school policy are scored according to number recorded by observer. Questions not indicative of the open school are marked with an asterisk and scored inversely, i.e. 4 pts. for a recording of 1, 3 pts. for a recording of 2, 2 pts. for a recording of 3, and 1 pt. for a recording of 4.
APPENDIX B

SCORES OF
CLASSROOM OBSERVATION RATING SCALE

<table>
<thead>
<tr>
<th>Questions</th>
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## Scores of Classroom Observation Rating Scale (continued)

<table>
<thead>
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<th>School C</th>
<th>School D</th>
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BIBLIOGRAPHY


58

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\[\text{Haddon, F. A., and H. T. Lytton, "Primary Education and Divergent Thinking Abilities in Four-Year Olds." British Journal of Educational Psychology, XLI (1971), 136-147.}\]


Katz, Lillian G., "Research on Open Education Problems and Issues." Available from College of Education Curriculum Laboratory, University of Illinois (1972)


Packard, Robert G., "Do We Have to Do What We Want Today?" *Teacher College Record*, LXXIV (May, 1973), pp. 553-557.


Ramey, Craig T., and Vera Piper, "Creativity in Open and Traditional Classrooms." Child Development, XL (June, 1974), pp. 557-560


Travers, Robert, Children's Interest. Western Michigan University, 1978.


Ward, William D., and P. R. Barcher, "Reading Achievement and Creativity as Related to Open Classroom Experience." Journal of Educational Psychology, LXVII (October, 1975), pp. 683-691.


