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ABSTRACT

This study compared the creative self-direction, creative behavior, and creative activities of preschool children to determine if students and teachers trained in the creative process and in observation techniques can, with reliability, observe the creative potential of young children. Creative abilities of 155 children from four preschool centers in Bismarck, North Dakota were identified through the use of three instruments: Kindergarten Evaluation of Learning (KELP); the Starkweather Test of Conforming and Nonconforming Behavior; and a Creative Activities Checklist (an instrument designed for teacher and parent training). Data were collected by teachers and college students enrolled in a 15-week course on creativity. At the end of the course, correlations among the three instruments were computed using Pearson's Product-Moment Correlation Coefficient and Spearman's Rank-Order Correlation Coefficient. General conclusions were: (1) teachers and students working with the three instruments can become aware of the total education of the child, including cognitive, affective, and psychomotor aspects; (2) the Creative Activities Checklist is a valid instrument for measuring small children's creativity; and (3) the checklist is of value in alerting both teachers and parents to the significance of creativity and some means of fostering it in children. (Author)

IDENTIFYING CREATIVE ACTIVITIES IN PRESCHOOL CHILDREN

by

Sister Margaret Mary Kelly

A DISSERTATION

Presented to the Department of Curriculum and Instruction
and the Graduate School of the University of Oregon
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S.M.M.K.

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CHAPTER I

INTRODUCTION TO THE STUDY

Rationale

Creativity has been a persistent and recurrent issue throughout the history of education. Although educational researchers have continually struggled to understand the nature of creative functioning, the conditions that facilitate and inhibit creative growth, and the means of rewarding creative achievement, it has only recently come to grips with a definition which can be qualitatively verified.

Because of investigations of such scholars as J. P. Guilford (1957), Viktor Lowenfeld (1959), E. Paul Torrance (1962), J. W. Getzel (1962), Donald MacKinnon (1964), Michael Wallach (1965), and Elizabeth Starkweather (1967), the topic has become so popular that there are now more than 5000 bibliographic entries on creative functioning (Hopkins, 1970).

Until 1955, most of the literature on creativity was largely philosophical. The accepted belief among most educators was that creativity was an intangible quality found in only a few people and not subject to research. Talented, creative people were thought to be different and even eccentric (Smith, 1963).

Guilford's research of the middle 50's focused on divergent thinking and transformational abilities as potential sources of creative talents. Later (1966) he dealt with the broader aspects

of creativity, about which he states: "Creative thinking is best distinguished by the fact that there are novel aspects to it, novel for the thinker himself. There is always some degree of transfer in every act of creative thinking. Items of information are recalled and used in some connection other than that with which they are learned and in some new form they were not experienced before" (p.74). Wilson, Robeck and Michael (1969) built on the idea of creativity and divergent thinking, which they explained as an intellectual operation by which information available from cognition and/or memory is transformed and combined to produce new information--a form of creative thinking. Guilford's (1957) research aroused interest in the subject of creativity, especially the aspect of divergent thinking. Since that time, which coincides with the launching of Sputnik, interest in creativity has generated hundreds of studies on the subject.

Torrance (1964) has offered much evidence that it is possible to provide educational experiences that will enhance the development of the creative abilities of elementary school children. Torrance's later research (1969) has resulted in increased recognition that children fundamentally prefer to learn in creative ways, and that the nature of the child's school and home experience influences the extent to which he uses creative behavior. He found that children have especially strong preferences and aptitudes for learning creatively, that they learn a great deal if freed to use creative thinking, but that they make little educational progress when teachers and parents insist that they learn exclusively by authority. Torrance (1970) has

stated, "All children and young people possess unrecognized and unawakened potentialities that will amount to little unless someone first recognizes and acknowledges them and then encourages their awakening" (p. viii).

Still earlier, Rollo May (1959) pointed out that a review of the literature shows an "insatiable" interest has developed in the creative process. He stressed that in speaking of creativity today, focus is in terms of the heretofore unsuspected creative potential of man, the ability of each individual to produce with originality, and the emergence in various forms of an innate ability found in every human being.

In pursuit of the ideas stressed by Torrance, Maslow, and May, Starkweather (1964) studied creativity in preschool children. She has suggested that creativity means the freedom to give of one's self rather than behavior that is coerced or imitative. She found that few children had this freedom (1967), and so concluded that the goal of parents and other educators should be to free the young child to live creatively and thereby prevent waste of creative talent.

Another study of children was that of the Harvard School of Education in 1969 under the direction of Burton White. He studied the behavior of Headstart children to see if it was possible to determine how and why a child develops the way he does. This led to deeper observations of the child in his home setting. The Harvard Preschool Study Report is based on direct home observations, over a period of two years, of the child under the age of three in his

family setting. The report stresses the interaction between mother and child as a cause of a definite direction in the child's development. This study reveals the influence of the home environment on the creative development of the child, and the possibility of picking out the abilities that distinguish the most creative three-year-old from a peer whose creative growth seems to be already stifled.

Statement of the Problem

Many parents of preschool children are asking for more information in the area of the creative development of their children. If the Harvard Preschool Project Report is correct in concluding that children by the age of three have developed a sense of competence--which could be interpreted as a sense of self-worth, a sense of trust, security and independence--then, parents and teachers of young children need to become aware of the literature on creativity and how the creative process can be developed or stifled in the young child (White, 1972).

When parents are asked to define creativity, they, like teachers, tend to answer by describing a particular talent (MacKinnon, 1963). This would reduce the definition of creativity to a product rather than a process (Torrance, 1963).

Consideration of this problem of creativity should provide some answers to such questions as the following:

1. What do we really know about creativity in the young child, since most of the research has been done with school-age children or

creative adults?

2. Could not further research in the area of creative behavior of the young child be done by teachers and those preparing to teach?

3. Is it possible to study the creativity of young children without acquainting their parents with knowledge of the educational process?

4. If parents and teachers were more aware of the creative potential of the child, would they be less likely to mold children into social conformity?

The present study will seek to provide some answers to the above questions.

Research on creativity has been conducted for several years, but the results have not reached many parents. College instructors, who have ready access to this material, could offer inservice workshops to parents and others interested in early childhood education, focusing on the creative aspects of child development. Ways of helping teachers and parents discern and encourage the creative self of the child at an early age need to be developed. An instrument is being designed that would identify those affective and cognitive characteristics of preschool children (1) which are observable in preschoolers, (2) which are observable in many situations, and (3) which can be observed with reliability by students and researchers in early childhood education.

Purpose of the Study

The purpose of this study was to compare the creative self-

direction, the creative behavior, and the creative activities of preschool children.

Hypotheses

Out of the purpose stated above, the following hypotheses were generated and tested:

1. A positive relationship exists between creative self-direction as indicated in KELP (Kindergarten Evaluation of Learning Potential--Appendix A) and creative behavior in preschool children as indicated by Starkweather (Appendix B).

2. A positive relationship exists beteen creative self-direction as indicated by KELP and the creative activities described in the present research (Appendix C).

3. A positive relationship exists between freedom to conform or not to conform to parents as indicated by Starkweather and creative activities as described in this research.

4. Creative activities in preschool children can be observed with reliability by educators (1) working with preschool children, (2) taking a course in which the creative process is studied, and (3) using the observation techniques produced for the purpose of the present study.

Definition of Terms

Following are meanings of specific terms used in this investi-

gation:

Creative self-direction refers to that learning that is controlled by the learner and involves the formulation or creation of new interpretations from previous associations or conceptualizations (KELP). It entails an understanding of the concept in order to develop an original item based on this understanding.

Creative behavior refers to the specific conduct exhibited by the child in his freedom to conform or not to conform to parents when given this choice (Starkweather--Appendix B).

Creative activities refer to items as determined through research in the field of creati ity and developed into a list and observation sheet by the Project Director of this research (Appendix C). Teacher-trainees are those students and teachers (1) enrolled at Mary College, Bismarck, North Dakota, (2) taking a course which dealt with creativity, creative behavior and creative self-direction in preschool children, and (3) doing field work with the children in this experimental study (Appendix D).

Limitation of the Study

One hundred-fifty-five students from four preschool centers in Bismarck, North Dakota, were used for the sample. Children with a age range of from 3:2-6:10 were chosen for the study and only the affective characteristics were assessed.

Significance to the Field of Education

Human creativity, according to Barron, "may prove to be the key to success or failure in mankind's quest for knowledge, in his journey beyond the bounds of the sure and the seen" (1968, p.8). Therefore, the development of the creative ability in the child should be one of the primary objectives of education.

As educators would readily admit, there is a distinction between knowing and discovering, between remembering and inventing, between intelligent behavior and creative behavior; but in intelligence tests and achievement tests widely used to evaluate ability and/or progress, the child's creative ability has been overlooked. This situation is paradoxical: research has shown that creative thinking contributes significantly to the acquisition of information (Getzel and Jackson, 1962; Torrance, 1962; Guilford, 1957). Yet when the focus of education is on the acquisition of information, the tendency is to emphasize rote memory and conformity, although these often inhibit creative thinking. Thus, the problem should be that of how educators can leave the imagination of children free and yet give them the facts and experiences conducive to creative activity.

A paradoxical situation is likewise evident in the socialization processes of preschool years. In teaching socially acceptable behavior, the parent often teaches conformity to prescribed standards while at the same time expecting the child to show increased independence. It is possible that the root of lost creativity in education lies in the socialization processes of early childhood, par-

ticularly lack of stress on independence training.

In 1964, Starkweather studied the preschool child and found that during these years individual differences could be seen (1) in the need to conform, (2) in willingness to try the difficult, (3) in freedom to explore and inquire, and (4) in other characteristics which relate to expressions of creative ability. Do not some of these differences develop, at least in part, because of the socializing process used by, or neglected by, parents and preschool teachers?

Observations show that young children are active and free in imaginative play; but as they grow older, they become more stereotyped in their behavior. Torrance (1962) has observed that inasmuch as the infant's lack of language limits his ability to learn "by authority", his learning is necessarily creative; he senses problems, makes guesses, tests and modifies these, and communicates, though in a limited way. As he grows older, the urge to inquire, to invent, to perform is too often apparently stifled. Could not this be prevented by education for parents and teachers on the nature of creativity?

Stoddard (1959) points to emphasis on conformity and fear of deviation in our culture patterns as evidence that the creative potential has been stifled in millions of school children or preschool children, now grown up. Taylor and Barron (1963) have expressed a similar point of view in their statement that understanding is needed of the fundamental nature of creative talent and learning how to identify it, so that educational and environmental programs more favorable to creative potential can be soundly developed both at home

and in the preschool environment. These observations give rise to the serious question of whether educational methods can change this pattern--this trend from the active and free expression of the young child to a more stereotyped behavior of the older child and adult.

In this regard, Torrance (1959) has cited as one of the school's responsibilities that of helping the child develop his creative potential. To do this, the teacher must have some knowledge about research on creativity and how it can be identified.

Research (Getzel and Jackson, 1962) has shown that teachers and parents prefer the highly intelligent child to the creative child, for the latter tends to disrupt the organization by his novel approaches. Taking a long range-view of this problem, one must ask whether the simultaneous development of creative behavior and "unconventional" behavior can be effected. The answer to this question may be found when preschool children with creative potential can be identified and longitudinal studies of creative ability initiated. For this, parents and teachers of preschool children must have a general starting point through acquisition of a broad background in the area of creativity and some means of observing it in children.

Organization of Presentation

Following this introduction, Chapter II discusses in more detail the literature that deals with studies of creativity and some techniques for observing it in children and adults. It defines some general characteristics comprised in the term "creative," and suggests

a relationship between the socialization process and creative expression.

Chapter III describes the design, the pilot study, and the procedures used in carrying out the present research. Chapter IV presents the results of the study, and analysis of the data, and the testing of the hypotheses. Chapter V includes a summary with conclusions. It also presents implications of the findings that may suggest further research.

Summary

"Creativity" is a term used to describe behavior of people, who in this chapter are specifically preschool children. Much research has recently been done in the area of creativity, but not much of it has been applied in the field of preschool education. Creativity, creative behavior, and creative self-direction will be studied in three to six-year-olds to determine if students and teachers trained in the creative process and in observation techniques can with reliability observe the creative potential of young children.

CHAPTER II

Review of the Literature

This chapter will present background research on the nature of creativity, studies of school-age children and adolescents, problems related to measurements of creative activities in preschool children, and studies of socialization and creativity.

Defining the Creative Process

Carl Rogers (1959) defined the creative process as the "emergence in action of a novel relational product, growing out of the uniqueness of the individual on the one hand, and materials, events, people, or circumstances of his life on the other" (p. 71-72). Here Rogers implied that an individual will become or achieve his potentialities by using his own means rather than those forced upon him. Hence, to be creative, the individual must be relatively free from inhibition, free to make novel combinations of ideas, free to express his curiosity and imagination. His need for approval and/or affiliation must be secondary to his willingness to try the difficult, to take risks, to be different, to be or not to be a nonconformist. Accordingly his creativity is proportionate to the strength of his convictions when they differ from the general norms with which he is familiar.

Coincidentally, Lowenfeld (1959), believing that every child is

born with creative ability, referred to the untapped creative resources of the individual as "potential creativity" and to that part of his creativeness which an individual uses in his work and actions as "functional creativity."

In a later study, Golovin (1963) referred to creative facility and creative ability, expressing the view that the only trait identifiable early in an individual's development is the former, creative facility. Indeed, according to Starkweather (1964), although theoretically a study of creative ability should start with the study of the infant, the complex and elusive quality of creativity makes such an approach impractical. She points out, too, that much of the research done recently has been devoted to the study of highly creative adults, usually identified by their productions or works. Their personalities have also been studied in an attempt to identify the characteristic factor in creative ability.

For example, MacKinnon (1963) pursued research on creativity under the influence of Rank (1907) who speaks of the stages or phases of acquiring individuality and realizing one's creative potential. Among Rank's types of men was the "creative type," which he described as the artist or "man of will and deed."

In similar fashion, Taylor (1959) categorized the characteristics of the creative individual as (1) intellectual and (2) motivational-interest. The former are those which seem to be valid indicators of creative talent: originality, adaptive flexibility, and ability to discern problems. Those traits which facilitate expression of

creative ability--tolerance of ambiguity, freedom to be a nonconformist, and willingness to try the difficult--according to Taylor are the motivational-interest characteristics.

In a 1957 study, Guilford found significant correlation between measures of traits of temperament and motivation, on the one hand, and measures of factors of ability within the area of creative performing, on the other. These traits include (1) impulsiveness and ascendance, which are related to ideational fluency; and (2) tolerance of ambiguity and less need for discipline and orderliness, which are related to originality. Guilford (1962) suggested, therefore, that creativity and divergent thinking, or fluency, flexibility, and elaboration, were part of the intellectual process. He hypothesized that the source of a fluent flow of ideas was the ease with which information could be recalled for use. For him, the creative, or original, person, had a longer mental reach than others, able to see relationships that other individuals would probably overlook.

Barron (1958), in a study of creative writers, points out that they are persons whose dedication is a quest for ultimate meanings. From analysis of these writers he concluded that they are not really different from creative individuals in other walks of life.

In keeping with this idea is the view of Maslow (1963), who states: "My feeling is that the concept of creativeness and the concept of the healthy, self-actualizing, fully-human persons seems to be coming closer and closer together, and may perhaps turn out

to be the same thing" (p. 42).

Earlier, Torrance (1962) hypothesized that, whereas some individuals develop dominant attitudes which facilitate creative growth, others generate traits that usually operate as obstacles to creativity. Likewise Getzel and Jackson (1962) stated that general cognitive style and general motivational structures were so inextricably related that they could be separated only for analytic purposes. They found, too, that highly creative types of children ranked in the top twenty percent in tests in which divergent thinking was stressed. This agrees with Guilford's (1957) finding that divergent thinking and evaluation are the creative aspects of the intellect.

More recently, Lytton (1972) published some interesting results of the Myers-Briggs Type Indicator, a test based on Carl Jung's typology of personality which contrasted the "judging" and the "perceptive" types. The former places more emphasis upon the control and regulation of experience, whereas the latter is inclined to be open and receptive to all experiences. MacKinnon (1963) had already noted that the majority of creative architects, writers and mathematicians were perceptive types. Another contrast measured by the Myer-Briggs Type Indicator was variation in preference for two different types of perception: (1) sensation, or direct perception through the senses; and (2) intuition, which transcends immediate appearances to reach deeper meanings and implicit possibilities.

Lytton (1972) also spoke of his research on creativity, implying an openness to experience, not bound narrowly to stimulus or object,

but ever alert to the as-yet-unrealized. Creative people, he found are open to mystic experiences, to feelings of awe, and to a sense of oneness with the universe.

In a study of ten-year-olds, McHenry and Shouskmith (1970) found divergent youngsters were suggestible, in that divergent thinking ability was significantly associated with yielding to the supposed majority interpretation of inkblots, where the interpretation was inappropriate and ran counter to the individual's previous ideas. This implies that these youngsters could see many viewpoints or possibilities in the interpretation. Hence these researchers believe that a person with with aptitude for divergent thinking can see many possibilities and hold many ideas in abeyance.

In what seems like a contrasting idea, Cattrell and Drevdahl (1955) and Crutchfield (1962) found that independent-mindedness characterized creative individuals. Moreover, Barron (1965) reported that in a task that demanded the estimating of lines, creative ability was significantly correlated with a greater independence of judgment and less willingness to yield to the majority opinion. Creative people had a preference for perceptual complexity and a ability to accept perceptual complexity or even disorder without being disturbed by it. They actually preferred the richness of this complexity to the relative poverty of a simplified geometrical design.

MacKinnon, too (1963), found that creative people were able to reconcile contradictions wihin their own personalities. This is

in conformity with the findings of Cattrells and Drevdahl (1955), who in their study of scientists considered to be creative in contributing to the advancement of science, reported that these people were not only highly intelligent, but had also independence of mind: they were dominant as well as sensitive in a psychological sense. When compared with the average population, these subjects were more introspective, reserved and cool; they tended to be outwardly inhibited, were serious, taciturn and self-sufficient to a degree, and displayed a fine disregard of social pleasantries as well as conventions.

Studies of School-Age Children and Adolescents

Study of the creative child has been confined for the most part to the population of school-age children and adolescents, as can readily be seen by surveying the works of Torrance (1962), Getzel and Jackson (1962), Wallach and Kogan (1965), and Guilford (1957). Instruments have been developed for the measurement of intellectual characteristics, such as originality, divergent thinking, and constructive cognition; and these characteristics have been studied in relation to motivational characteristics, such as nonconformity and willingness to take a risk. In general, all these writers agree that intellectual and motivational characteristics can be separated only in theory. They also hold that certain motivational characteristics are required for the expression of creative talent.

In their 1962 study of elementary schoolchildren, Getzel and

Jackson, writing on the divergent thinking ability of these children, noted they willingly take a stand against the dominant values of their culture; that they are unconventional and independent in judgment, and that they are not particularly interested in the qualities that make for worldly success. Instead, they prize qualities of value to them as persons, while realizing that these would not necessarily earn them respect in the world. Such children were less popular with teachers.

Torrance likewise suggested (1962) that the creative child is often lacking in popularity, and that consequently, pressures may be a factor inhibiting the development of divergent thinking abilities. Hudson (1966, 1968) compared convergent- and divergent-thinking students, showing that convergers tended to adopt attitudes which are generally called "authoritarian," and manifest unquestioning respect for authority; they also are ready to accept experts' advice without any independent thinking. Convergers are also more likely than divergers to approve of obedience for the sake of obedience, and they tend to have rigid, inflexible opinions.

Studies of Preschoolers and Creativity

As has been mentioned above, studies of creative ability in children of preschool age are few indeed. However, the work of Andrews (1930), Markey (1935), Northway and Rooks (1955), and Torrance (1969) have implications for the present research and merit mention here.

Perhaps the most systematic and careful study of creativity and

imaginative functioning and development during preschool years is that of Andrews (1930) at the University of Iowa Child Study Center. She used a variety of psychometric methods and types of observation and attempted to study an array of types of imaginative and creative activities. Three of her tasks were presented tachiscopically with the task of forming new products (transformation). The following kinds of observations were made of imaginative play from children from two to six: imitation, experimentation, transformation of objects, transformation of animals, acts of sympathy, dramatization, imaginary playmates, fanciful explanations, fantastic stories, new use of stories, construction of new games, extension of language, appropriate questions and leadership with a plan.

On the basis of this data, Andrews found that total imaginative scores are highest between the ages of four years to four years and six months, with a sudden drop at the age of five when children usually enter kindergarten. In surveys of nursery or preschool teachers, emphasis was shown to be on obedience, quietness, courtesy and promptness; such traits as adventurousness, independence in judgment, curiosity and willingness to take risks were discouraged.

In 1935, Markey studied the imaginative behavior of preschool children. She observed these children during free play and in two experimental situations, one a block-building game and the other a housekeeping game. The individual and group differences which she noted led to her conclusion that the same test of imagination does not tap all the imaginative resources of the individual; nor

is it valid for all ages, since the level of a child's understanding may influence his imaginative response.

In a study of cultural discontinuities and the development of originality in thinking, Torrance (1962) included the work of Andrews and Markey in order to extend his generalized developmental curve to include children of preschool age. He developed several tests which could be used with children before the first grade.

Another study that showed that there is an apparent drop in creativity at the age of five, or about the time the child enters kindergarten, was done by Pulsifer (1963). She observed that before this age children were very spontaneous in making up small poems and songs, but that creativity ceased entirely about age five.

In an attempt to prevent this drop in creativity or to reverse this trend, Fortson (1971) set up the Creative-Aesthetic Approach to School Readiness Curriculum, in which intellectual skills were taught through guided creative activities over a three-month period. At the end of the three-month period, her findings showed substantial and statistically significant growth on the measures of verbal figural creativity. Growth, even an intensification of curiosity and interest in creative activities, was found rather than a lessening of them.

Speaking in 1966 at the first Seminar on Productive Thinking in Education at Macalaster College in St. Paul, Minnesota, Starkweather made the following astute statement: "As our understanding of creative ability increases, we should be able to provide our children

with the knowledge and experience necessary for creative expression and at the same time grant to each child the freedom to move in a manner of his own choosing toward the distant goals which will emerge as he crystallizes his philosophy of life. Freedom is the birthright of our children, and responsible freedom is the foundation on which creative ability rests" (p. 8).

Socialization and Creativity

In regard to home environment and the development of creativity, Bouchard (1967) gives some insight when he brings out the idea that although we know comparatively little about the effectiveness of early-education tehniques, it is increasingly clear that the pre-school child is an extremely plastic organism capable of widely varying intellectual behavior under different conditions of environment and training. He cites the findings of Jean Piaget in his monumental works and studies on the reception of information from the environment, information-processing, and language and communication, which demonstrate that the preschool child is developing intellectually as he grows physically and matures in emotional and social behavior.

Knowing that the primary socialization is usually the most important one for an individual, and that the basic structure for primary socialization is the family (Berger, 1966), we can better understand Spingain (1973) when she writes that to create a human being requires the commitment and attention of someone who has an

irrational attachment to the child, for the process of making human beings human involves letting the child learn from the adult or an older child, and hence discover his own confidence by having someone learn something from him. In her opinion, therefore, education for parenthood is one of the greatest needs today.

The need for parenthood education is also brought out by Chess and Thomas (1964) in their study explaining how a child's own temperament is important in the socializing process. They feel characteristics can be modified by indulgences by parents and others, but that temperamental characteristics of the child which he brings to the situation affect his development and behavior. Hence, it is not the parent, the child, or his environment alone, but all three factors that influence the child's specific personal characteristics in interaction with parents, teachers, friends and the rest of the world.

Thinking along these same lines, Russell and Mollie Smart (1973) stress positive and negative aspects of the child. The positive side is contentment, absorption in play, following through, sustained directed activity and lack of either constant quest for help or attention-seeking. Children who manifest these traits develop better problem-solving capabilities than children less positive. The negative aspect is characterized by a sense of shame or worthlessness, stubbornness and exercise of power. Negative feelings occur when the child cannot choose, does not act independently, or makes such disastrous choices that adults use shaming as control. The young child is very vulnerable to shaming. He needs firm reassurance whenever he

does make a choice.

Comparing behaviorist and psychoanalytic thinkers, McCandless (1972) found that the former were much concerned with environmental factors affecting the rate of creative growth. Behaviorists usually view creativity as a product, unlike psychoanalytic thinkers, who have concentrated most on creativity as a process. Both groups, however, regard the nurturance of creativity as a basic goal of education. McCandless also called attention to an assumption that creative ability may be developed under the "right conditions"; but he warned that the exact nature of these facilitating conditions might well be different for any two children or adolescents, even though some conditions may apply to most people. Both McCandless and Evans (1972) believe that creativity is a valuable part of human development, which must be fostered and encouraged in the schools.

From his research on children in the elementary school, Torrance (1967) reported that children learn best when given an opportunity to learn in ways suited to their motivations and abilities. Whenever teachers changed their ways of teaching in significant ways, he observed a different type or group became the star achievers. Accordingly, the fact that teachers need to understand the creative assets of the individual child was apparent in his research. Another significant point was that perceptions of essential learnings for the child influenced the results of the educational process. Torrance found, too, that instructing teachers in methods of rewarding creative behavior was largely unsuccessful. At the same time, he observed that teachers encouraging creative motivation

witnessed more progress in their classes than did teachers who relied on critical or control motivation.

A broader understanding of why an individual's personality affects his teaching pattern is brought out in the 1964 study of Doyle and Chace, who investigated the personality trait of allowing others to be open and flexible in their approach to life. They focused on three broadly defined variables: (a) characteristics of parents as these relate to obstructing creativity in the child; (b) characteristics of the training environment; and (c) characteristics of a person's cognitive or conceptual system, some of which are believed by Doyle and Chace to be indicators of potential creativity. They, like Lowenfeld (1959), distinguished between actual and potential creativity, assuming that cognitive functioning which is complex, flexible, abstract, open to new experience, and integrated as opposed to compartmentalized, is a necessary but insufficient condition for creative performance. Actual creative production, they believe, depends upon other personality and situational influences at particular points in time. The kind of conceptual system developed through socialization and education, however, is an important determinant of whether one will be creative when and if other conditions are optimum.

In another study, Bishop and Chace (1972) did more profound research into the conceptual style of the parent and the creativity of the child. In this study they investigated the relation between parents' level of conceptual development and the nature of their

children's home-play environment, in terms of such dimensions as complexity and flexibility. They compared the degree of variability in either parent's conceptual system with that of his child. Their findings showed: (a) that parents serve as direct models for their child's conceptual development; (b) that parents' conceptual development limits and conditions the kind of environment and experience they can provide for their child; and (c) that the child's home-play environment, including parents' attitudes and actions regarding it, is important simply because young children spend the larger part of their waking hours engaging in play; and (d) that the play environment serves as a point of interaction between a parent and his child.

Parental characteristics and children's play environment in relation to cognitive complexity and creativity have been studied by other researchers (Greenacre. 1959; Getzel and Jackson, 1961; Weisberg and Springer, 1961; Dryer and Weiss, 1966; and Sutton-Smith, 1967) with much the same results being reported.

Also discussing the conceptual system of persons, Harvey (1961), distinguishes between "concrete" and "abstract" individuals. "Concrete" individuals tend to be authoritarian, closed-minded, undifferentiated and compartmentalized in their conceptual functioning; whereas "abstract" individuals are highly differentiated, open to input from outside their belief systems, yet optimum in centrality, and integrated in their conceptual functioning.

Elaborating on the teacher's conceptual system, Harlow (1971)

wrote of three relational patterns of the teachers whom he studied, classifying them in regard to survival, adjustment and encounter. The encounterer has characteristics comparable with Harvey's (1963) "abstract" person noted above. For the encounterer, freedom springs from encouragement of the traits he brings into the school situation. For the adjuster, however, whose locus of concern is the "right" way, freedom would be nurtured by providing greater areas of self-direction so that he would not always accept the judgment and decisions of others. For the "survivor," freedom comes only after the child learns, with the support of the teacher, that life is not overpowering and that he can venture forth and be successful. In answer to the question of whether teachers are concerned with these three relational patterns, Harlow (1971) contends that his experience and observations indicate the schools' almost exclusive concern with adjustment patterns. Therefore, most teachers expect their students to accept the standard ways of behaving and knowing.

Where does this leave the creative person who feels he cannot conform to social norms that run counter to his convictions? The creative person, or Harlow's encounterer, has such an independence of mind and spirit that he questions those principles of conduct and norms in relation to some greater personal meaning and therefore can annoy parents and teachers.

Confirming these views are studies by Getzel and Jackson (1962), Torrance (1965), and Yomomoto (1965) who agree that the child exhibiting independent and creative learning behavior is generally isolated

by his classmates and viewed as rebellious by teachers. Therefore, the need to make teachers aware of the creative process and the way the socializing process affects it, is of importance in the education of parents and teachers. For, as Provus (1971) says, "A social climate is essential which will balance stress and reward in such a way that the students will feel free to risk failure and loss of self-esteem in an attempt to cope with a problem which is meaningful to the group with whom they have identified" (p. 133).

In speaking of education of the young child, Binet (1909) maintained that all, or almost all, children begin school with highly developed learning skills, acquired by experimenting, manipulating objects, rearranging and combining them in different ways, as well as by singing, drawing, dancing, story-telling, and the like. It was his contention that we should graft education onto these already developed learning skills, rather than suddenly abandoning learning in these ways for ways strange to the child,such as having to sit all day in one place and work from his desk.

Taking his cue from what he felt was the child's intrinsic motivation for learning, Maehr (1968) stressed that any program of learning must be based on the consideration that the student does think about what he is doing, and that his peculiar thoughts on the matter are the critical "motivators." He feels that the learner is a creature who not only receives incidental pleasure from varied experiences, but is activated if the task is somewhat unpredictable and if he feels he is competent to do the task. Maehr also wished

that educational researchers today would grant as much time to work on risk-taking and curiosity as to studies of "primitive and peripheral response learning", if they, the educators, are really concerned with the question of motivation and its place in learning.

Dealing also with the motivating aspect of the child's life, Kirk (1970) brings out that the child's world is one of wonder. He believes that if the yearning for the wondrous is denied in childhood, that lack will be manifest later in life, producing a dull adult, easily bored; or, a young adult seeking a substitute for the wondrous in narcotics or sexuality. Kirk warns that the child lives in a world of fantasy and from there he comes to know or apprehend reality; but if the child's wonder in creation is not directed, disciplined and purposeful, he will not become a genuine human being. Kirk holds that the child's senses and reason must be tutored properly if he is to become truly human: "Thrust mere abstractions upon the little boy and girl, even if those abstractions are meant to produce the 'informed' citizen, and the mind and the conscience must lie dormant" (p. 13).

Maintaining that guidance is needed if the child is to be allowed to choose and to control his own life, Chambers (1973) tells us that any choice a child makes must be backed by appropriate experiences and knowledge. He suggests that what the Children's Rights Movement has missed seeing is the children's right to a childhood.

Also suggesting guidance but not dominance for the young child is Mendel (1973) in his discussion of the two successive stages a

child passes through in achieving his true self. He feels that the child's sense of impotence and need for imagination in his quest for maturity should bring teachers and parents to a realization of the child's need for outside support that he can identify with and project into. A dichotomy exists between the statement of certain parents that they want their children to become more independent, who, however, when this requires that the child be allowed to take a risk, at once fall back upon authority. Mendel writes that every conditioning process in the upbringing of children requires that they be given a carefully controlled amount of information so that a "specific link can be established between the stimuli offered and the responses to them" (p. 64). He agrees that children in contemporary society receive increasing amounts of contradictory information, and are not given the chance to develop socially and materially. Hence, they are subject to repression, antisocial behavior, and to a hunger for some meaning in magic or its equivalent.

Suggesting that we must put an end to separation of home and school, James Hymes (1968) says: "Too much is at stake to let the foolish lack of communication persist in which the left hand never knows what the right is doing" (p.78). The above examples would also suggest that what happens in the home affects the child as deeply as what happens at school. Both parents and teachers need to be aware of the creative process and allow it to develop in the child as he interacts with important adults in his life.

Summary

The current state of research on creativity and the creative process shows that certain characteristics have been classified by researchers through study of products of adults. Children, however, who have not as yet authored any great production, also have many of these characteristics; but many of them are lost about the time they start school. How can this loss of creativity be stopped? Parents need to be aware of the research on creativity and the socializing processes that may hinder its growth. There is a great need to study the creative process and the preschool child before the socializing forces of the homes and schools, as many of them now operate, stifle him. Where perceptive parents and teachers have set up responsive environments, the creative aspect of the child was able to flourish.

Chapter III will present a plan for the development of an instrument that could be used by both parents and teachers to observe their children and become aware of their creativity.

CHAPTER III

METHOD

Design of the Study

The purpose of this study was to compare the creative self-direction, the creative behavior, and creative activities of pre-school children. The children were observed through the use of three instruments, and correlations were made to determine whether a positive relationship exists between measures of creative self-direction (KELP), creative behavior (Starkweather) and Creative Activities Checklist (an instrument designed for teacher and parent training).

In the execution of the study, consideration was given to identification of the children used as sample, selection of the instruments, training of the professional personnel, and collection and treatment of the data. This chapter provides background information regarding the procedures used, and describes the pilot study and the sample group.

Pilot Study

A pilot study was conducted for the purpose of perfecting techniques to be used for training teachers to make observations required for the proposed study.

At the end of her examination of literature pertaining to crea-

tivity, the Project Director made a list of creative behaviors found in several references (Andrews, 1930; Northway and Rooks, 1955; Guilford, 1957; Rogers, 1959; Taylor, 1959; Torrance, 1962; MacKinnon, 1962; Getzel and Jackson, 1962; Starkweather, 1964; and Wilson and Robeck, 1969). This list was then assessed by several teachers with many years of experience in the area of early childhood education as to interjudgmental agreement regarding observability of traits (Appendix D). After teachers had used the instrument in the class and discussed the meaning of the terms, each item was checked for interreliability of the observations. The check list and its glossary of terms were then revised to their present form (Appendix C).

Through Mary College, Bismarck, North Dakota, the Project Director offered a class dealing with creativity to teachers at the four sites chosen for the sample, and to juniors in education at the college (Appendix E). The Starkweather test measuring freedom of preschool children to conform or not to conform under the influence of a chance to conform to parents (Appendix B) was then administered to ten children in the Jack and Jill Kindergarten in Bismarck, North Dakota, by the Project Director. These ten children had used the KELP materials for a period of ten weeks, but only the creative self-direction scores were used for this study. Two teachers from the kindergarten individually scored the ten children on the Creative Activities Checklist. A mean score for each observation was computed and these scores were correlated with each other and with KELP and Starkweather scores to find their level of significance.

Pearson's Product-Moment Correlation Coefficient formula was chosen, since "this method is appropriate when data are linear" (Clarke, p. 221). Correlations between the composite mean score for each child on the two observers scoring the Creative Activities Checklist showed reliability coefficients of .77 ($p<.01$). Therefore, Hypothesis # 4 was tentatively accepted in this pilot study; it states that creative activities of preschool children can be observed with reliability by teachers trained in observation techniques and acquainted with research in the area of creativity.

Hypothesis # 1 states that a positive relationship exists between creative behavior in preschool children, as indicated on the Starkweather instrument, and creative self-direction developed through the use of KELP; this hypothesis was tentatively confirmed by a .66 ($p<.05$). Hypothesis # 2, regarding a positive relationship between creative self-direction (KELP) and creative activities as described in the present study, was vindicated by a correlation of .56 ($p<.10$). Hypothesis # 3, that a positive relationship exists between freedom to conform or not to conform to parents (Starkweather) and the Creative Activities Checklist designed for this study, showed a correlation of .60 ($p<.05$).

Table 1 presents the Product-Moment Correlations as computed from the pilot study data.

The rationale for the pilot study was to strengthen the teachers' techniques of observation through use of KELP items and of the Starkweather instrument. Since the latter tests the child's psychological

freedom to conform or not to conform, it served to provide observers with keener perceptiveness before they began using the instrument developed for the present study. Because in this pilot study of ten children, all four hypotheses showed satisfactory levels of confidence and positive linear relationships, it was considered appropriate to use these same three instruments in an expanded study.

The Sample

The sample for the study consisted of 155 children with an age range of from 3:2 to 6:10 (Table 11), having a mean age of 5:3 and a SD of 3.15. The children attended preschool classes at four sites in Bismarck, North Dakota. These particular sites were chosen because they encompass the different economic levels in the city of Bismarck.

The teachers at these four centers and a number of students from Mary College, all of whom had taken a course dealing with creativity from the Project Director made the observations for this study (Appendix D).

Site #1, Jack and Jill Kindergarten, enrolls children, aged four to six years, from families in the upper- and middle-class economic brackets. Parents of these children are mostly professionals who are able to afford the $20 monthly tuition of this kindergarten, which is privately owned and operated by the Director of the Bismarck Early Childhood Education Programs. Thirty-one children, which include the ten in the pilot study, were chosen selectively by the head teacher at this center. From a total of 140 children, whose

TABLE I

PEARSON PRODUCT-MOMENT CORRELATION
COEFFICIENT SCORES BETWEEN
THE THREE INSTRUMENTS
PILOT STUDY
(N=10)

N	Mean Age	Mean Score		r	p
		KELP	STARKWEATHER		
10	5:11	4.0	4.1	.66	<.05
		KELP	CREATIVE ACTIVITIES		
10	5:11	4.0	1.9	.56	<.10
		STARKWEATHER	CREATIVE ACTIVITIES		
10	5:11	4 1	1.9	.60	<.10
		CREATIVE ACTIVITIES			
		Teacher # 1	Teacher # 2		
10	5:11	1 7	2.1	.77	<.01

TABLE 2

DISTRIBUTION OF SUBJECTS
BY AGE AND SEX
(N = 155)

Age Group	Boys	Girls	Total	Percent
Six-year olds (6:0 6:10)	22	17	39	25%
Five-year-olds (5:0 - 5:11)	35	27	62	40%
Four-year-olds (4:0 - 4:11)	19	20	39	25%
Three-year olds (3:2 - 3:11)	6	9	15	10%
Total preschoolers (3:2 - 6:10)	82	73	155	100%

names were all placed in a box, she pulled out the names of the 31 who would become part of the study and with whom the college students would work. The age range for these children was 5:1 to 6:3 with a mean of 5:10 and a SD of 3.7. Two teachers from the kindergarten and six college students were enrolled in the class; they gathered data on the KELP items. The two teachers scored the Creative Activities Checklist for each child at the end of the class. Teacher-observer #1 has worked at this kindergarten for the past thirteen years and is now completing a degree in elementary education. She is the mother of three children aged 15 to 21. Teacher-observer #2, who has worked in this kindergarten for two years, is a college junior in elementary education. She is the mother of two young children. The Project Director administered the Starkweather test to the children at the completion of the semester cou se and did a double-check on the creative self-direction exhibited by these preschoolers.

Site # 2. The Bismarck Headstart Center, is a federally funded project enrolling children in the lower income bracket. Ten percent of the children are in a Handicapped Program, also funded federally. Income for these families is derived from unskilled labor, welfare and charity. There is a high incidence of divorced and single parents. The total population of seventy-five children participated in the study; their mean age was 5:3, with a range of 3:3 to 6:10, and SD of 3.04. Five classroom teachers and their five aides took the course offered by the Project Director. They helped gather KELP scores, made observations, and completed a checklist on the creativity dis-

played by the children.

The Head Teacher for the Headstart Center is also teacher in Room #1. Holding a B.S. degree in elementary education, she has taught five years in elementary school and four years in preschool. Her aide is a single parent of two children; she has worked with the preschool for two-and-a-half years and is now a college sophomore in early childhood education.

The teacher in Room #2 has a B.S. degree in elementary education, and has taught preschool for three years. Her aide, a junior in college majoring in elementary and early childhood education is working for the first time in a preschool program. Her previous teaching experience was one year with a seventh-grade religion class.

The teacher in Room #3, with a B.S. degree in elementary education, has had four year of teaching experience in a rural school and eight years in preschool. Her aide is a single parent, the mother of four children, working with Headstart for the first time.

The only man at this center is the teacher in Room #4. He has a B.S. degree in elementary education with two years of teaching experience. His aide, a single parent of four children, is a sophomore in college.

Both the teacher and her aide in Room #5 have college degrees. The former has a degree in music education and has worked with Headstart for four years. She is the mother of five children. Her aide holds a B.A. in French and secondary education. Her experience has been in teaching private French lessons to students in the elemen-

tary school and teaching dance at the YMCA. This is her first year with a preschool. She has begun work on a masters in early childhood education.

Site #3, the United Tribes Employment Training Center Kindergarten, enrolls students whose parents, belonging to Indian tribes throughout the United States, come to spend a year at the Center in order to be trained in a vocational specialty. The income of these parents is at poverty level; funds from the Bureau of Indian Affairs (BIA) support them during the training session.

The kindergarten population is very transient, often changing every month. Twelve children who would remain throughout the period of data-gathering for this research were chosen from the Center.

Teacher-observer #1, the kindergarten teacher, has a B.S. degree in early childhood education and an M.A. in Behavioral Studies. Although she is spending her first year in this kindergarten, she has previously worked on Indian reservations in the preschool area, and has taught kindergarten for five years.

Her aide, Teacher-observer #2, is a young Indian girl at the preschool for the first time. She has had no college training except for in-service work in early childhood education.

The twelve children from this kindergarten included two sets of twins. The age range for the United Tribes Training Center Kindergarten children chosen for this study was 4:9 to 6:2, with a mean age of 5:6 and SD of 5.81.

Site #4, the Bismarck Day Care Center, is a federally funded preschool program which enrolls children of parents on welfare or in unskilled work. The total population of thirty-seven children participated in the study. Teacher-observer #1 on the Creative Activities Checklist, is the director of the Center. She has a B.S. degree in elementary education and is with the Center for the third year. Teacher-observer #2, is a freshman working for the first time with preschoolers. The age range of these children was 3:1 to 6:2 with a mean age of 5:7 and SD of 3.59.

Selection of Instruments

The use of three instruments that measure some aspect of creativity were chosen to strengthen the present study. One instrument selected to measure creative self-direction was KELP (Kindergarten Evaluation of Learning Potential--Appendix A). This instrument (1963), which is not only for learning and teaching but also for testing, explores the abilities of preschool children in the areas of association, conceptualization, and creative self-direction. At the associative level the child copies, reproduces, or imitates a model which is provided; at the conceptualization level, he shows that he has grasped the inherent relationships of the bits and pieces of information already associated. Creative self-direction involves a higher level than the other two and in fact, incorporates them. Associative learning and conceptualization both have an aura of learning from another; but on the creative self-direction level, the learning is characterized

by outcomes which are directed from within and to some extent unpredictable. Teacher-training in the use of KELP items involves the ability to discriminate between these three levels. The Project Director checked the children at the end of the class after the students and teachers had turned in a creative self-direction score for each child. Thus each child was double checked on these items.

The second instrument, developed by Starkweather (1964) to measure the child's freedom to conform or not to conform to parents, measures psychological and/or physical pressure exerted by the family. The criteria of Starkweather for establishing this instrument are: (a) The compulsive quality and the conforming quality of a child's behavior must be measured independently, as the child who is a rigid non-conformist is no more free than the child who is rigid conformist; and (b) conforming behavior must be studied in a variety of situations. The results showed that children conformed more to parents at this age than to peers. Therefore, the instrument chosen for this research was Starkweather's test in which the child was given an opportunity to conform or not to conform to a parent of his choice when he could freely choose. The instrument and its validation are explained in Appendix B. This instrument was used by the Project Director to test the child's freedom to use conforming or nonconforming behavior in the following way: (a) Each child chose his favorite and his least favorite colors from a color wheel containing thirteen different colors. The first, fourth, seventh, tenth and thirteenth color choices were used in ostensibly making a book of twenty pages of varying colors with a

picture of an animal or bird on each page. The child made his choice for each of the twenty pages after the teacher made her choice of color to be used in the book she was making for his parent. (b) Each color was presented twice as a conforming color and twice as a non-conforming one. The hypothesis for this instrument was that a child who is really free to conform or not to conform would have a score close to zero, while a rigid conformist would have a score at or near +20, and rigid nonconformist would have a score of/or at -20.

(c) The Starkweather scores obtained by each child **(absolute values) were made equivalent with KELP in the following manner:**

KELP	Starkweather scores	Ratings
5	0 - 2	5
4	3 - 4	4
3	5 - 6	3
2	7 - 8	2
1	9 - 10	1
0	11 - 20	0

Thus the highest scores on KELP and the scores showing the most freedom on Starkweather were equivalent and could be tested for degree of correlation.

The third instrument was a checklist of creative activities that could be observed in preschoolers. This instrument was composed of terms describing characteristics of creative behavior as found in literature and analyzed by experts in the field of early childhood education for logical content and observability in preschoolers.

Testing of the Instruments

The hypotheses stated that there is a positive relationship between the three instrument scores. Since the relationship is in a linear direction, the method chosen for scoring the degree of correlation between any two scores was the Pearson Product-Moment Correlation Coefficient. Because the instrument scores has a very narrow or truncated range, 0 to 6, it was felt that a truer picture could be obtained on the degree of correlation by also using the Spearman Rank-Order Correlation Coefficient formula. Following the finding of the degree of correlation between scores, a scatter diagram was constructed on each of the instruments paired with the other two to see if the degree of relationship was indeed positive.

Summary

A pilot study was conducted in order to perfect items and observation techniques, to train observers, and to determine the feasibility of continuing the study. The hypotheses stating that a positive relationship existed between the scores on the instruments under study proved to be adequately significant for acceptability; therefore, the study was expanded to include 155 children at four sites. A class was offered to teachers at the four sites chosen for the study, and to juniors at Mary College, where the Project Director is an associate professor of education. This class dealt with research on creativity and the methodology of the three instruments to be used in measuring creative behavior. The teachers

and college students alike worked for one semester gathering data; at the conclusion of the class, the teachers rated their children as to their observed creativity. For this they used a checklist prepared by the Project Director. It had been previously rated for inter-judgmental reliability and item observability and then revised.

At the conclusion of the data gathering, each child's scores were checked against all the others to determine if a correlation of significant value existed among them, as stated in the working hypotheses. The statistical norms used to determine this were Pearson Product-Moment Correlation Coefficient and Spearman Rank-Order Correlation Coefficient. Scattergrams on each pair of scores was constructed to test the direction of the relationship.

CHAPTER IV

RESULTS

The purpose of this study was to compare the creative self-direction, the creative behavior, and creative activities of preschool children. The children were observed through the use of three instruments, and correlations were made to determine whether a positive relationship exists between measures of creative self-direction (KELP), creative behavior (Starkweather) and Creative Activities Checklist (an instrument designed for teacher and parent training). This chapter deals with the analysis of the data and the testing of the hypotheses in light of that analysis.

The independent variables were the scores the students obtained on the three instruments and on the ratings of Creative Activities by two teacher-observers for each child. Assessment of the scores taken at the end of a semester course dealing with creativity was based on the Pearson Product-Moment Correlation Coefficient and the Spearman Rank-Order Correlation Coefficient (McCall, 1970, pp. 117 & 308). A scatter diagram was constructed to show the observer reliability of the observation instrument developed for this study and future use by teacher trainers to foster creative behavior in preschool children.

Analysis of the Data

Analyses of the creativity scores for children of preschool age

were based on scores on three instruments; KELP which measures the creative self-direction of the child; Starkweather. which measures the child's freedom to conform or not to conform to parents; and the Creative Activities Checklist, which measures the child's freedom and creativity in its many aspects. The scores were gathered after a semester (15 weeks) class on creativity had ended. Each pair of scores were correlated with each other to determine if a relationship existed.

Table 3 presents the degree of relationship existing between scores as computed through use of Pearson's Product-Moment Correlation Coefficient. This measure was used because the sample size of 155 would be sufficiently large to meet the assumption of normality. A mean score for each instrument is presented, as well as the mean age of the children in the study. The degree of relationship existing between scores on KELP and Starkweather is .55, while the degree of relationship existing between KELP and Creative Activities is .50 and between Starkweather and Creative Activities .42. The degree of relationship existing between the scores of the two teacher-observers yielded a correlation of .81. All of the correlations are significant beyond the .005 level of confidence. This shows that, although the variance will be quite small between scores on three of the instruments, they do test creativity to some degree.

Although a sample of the size of 155 is sufficiently large to make the assumption that the two population distributions approach normality, the range of the possible scores was 0-6; therefore, it

TABLE 3

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENT BETWEEN SCORES ON THE THREE INSTRUMENTS (N = 155)

N	Mean age	Mean score		r*	p**
		KELP---STARKWEATHER			
155	5:2	1.4	2.2	.55	<.0005
		KELP---CREATIVE ACTIVITIES			
155	5:2	1.4	2.9	.50	<0005
		STARKWEATHER---CREATIVE ACTIVITIES			
155	5:2	2.2	2.9	.42	<.0005
		CREATIVE ACTIVITIES			
		Teacher-observer$_1$---Teacher-observer$_2$			
155	5:2	2.9	2.9	.81	<.0005

* $$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{(N\Sigma X^2 - (\Sigma X)^2)(N\Sigma Y^2 - (\Sigma Y)^2)}}$$

** Critical values of the Pearson Product-Moment Correlation Coefficient taken from Table D., p. 369 in Robert B. McCall's Fundamental Statistics for Psychology. New York: Harcourt Brace and World, Inc. 1970.

was considered feasible to compute the degree of correlation on a scale using a rank order correlation coefficient also. The Spearman Rank-Order Correlation Coefficient formula (Table 4) was chosen. This formula provided for correction of tied ranks (Elzey, p. 299). Table 4 shows that the correlations computed do not vary to a great degree from those computed by the Pearson Product-Moment Correlation Coefficient. The Spearman Rank-Order Correlation Coefficient yielded the following results; scores between KELP and Starkweather, .56; between KELP and Creative Activities, .44; between Starkweather and Creative Activities, .40; and the pair of scores on the Creative Activities Checklist, .70. All of these results were significant beyond the .0100 level of confidence. This shows that the three instruments measure creativity to some degree.

The instrument developed for this study, the Creative Activities Checklist, yielded correlations of internal reliability of .70 and .81. Validation of the instrument will be made by a second observation, after a period of two months, by the same teacher-observers. Results of this will be written in Chapter V.

Scatter diagrams were plotted for each set of scores to determine if the direction of the linear relationship was indeed positive before the correlations by the use of Pearson's formula were computed. Results of the relationship between observers on the Creative Activities Checklist, the instrument developed for this study, are shown in Figure 1.

TABLE 4

SPEARMAN RANK ORDER CORRELATION
BETWEEN SCORES ON THE THREE
INSTRUMENTS
(N = 155)

N	Mean age	Median scores		rho*	p**
		KELP ⟷ STARKWEATHER			
155	5:2	1.0	2.0	.56	< .0100
		KELP ⟷ CREATIVE ACTIVITIES			
155	5:2	1.0	2.9	.44	< .0100
		STARKWEATHER ⟷ CREATIVE ACTIVITIES			
155	5:2	2.0	2.9	.40	< .0100
		CREATIVE ACTIVITIES			
		Teacher # 1 ⟷ Teacher # 2			
155	5:2	2.9	2.9	.70	< .0100

* $\text{rho} = 1 - \frac{6\Sigma D^2}{N(N^2 - 1)}$

** Values of p (Rank-Order Correlation Coefficient) at the .05 and .01 levels of significance, taken from Elzey F. Freeman 's A Programmed Introduction to Statistics. Belmont, California: Brooks/Cole Publishing Company. 1966. p. 350.

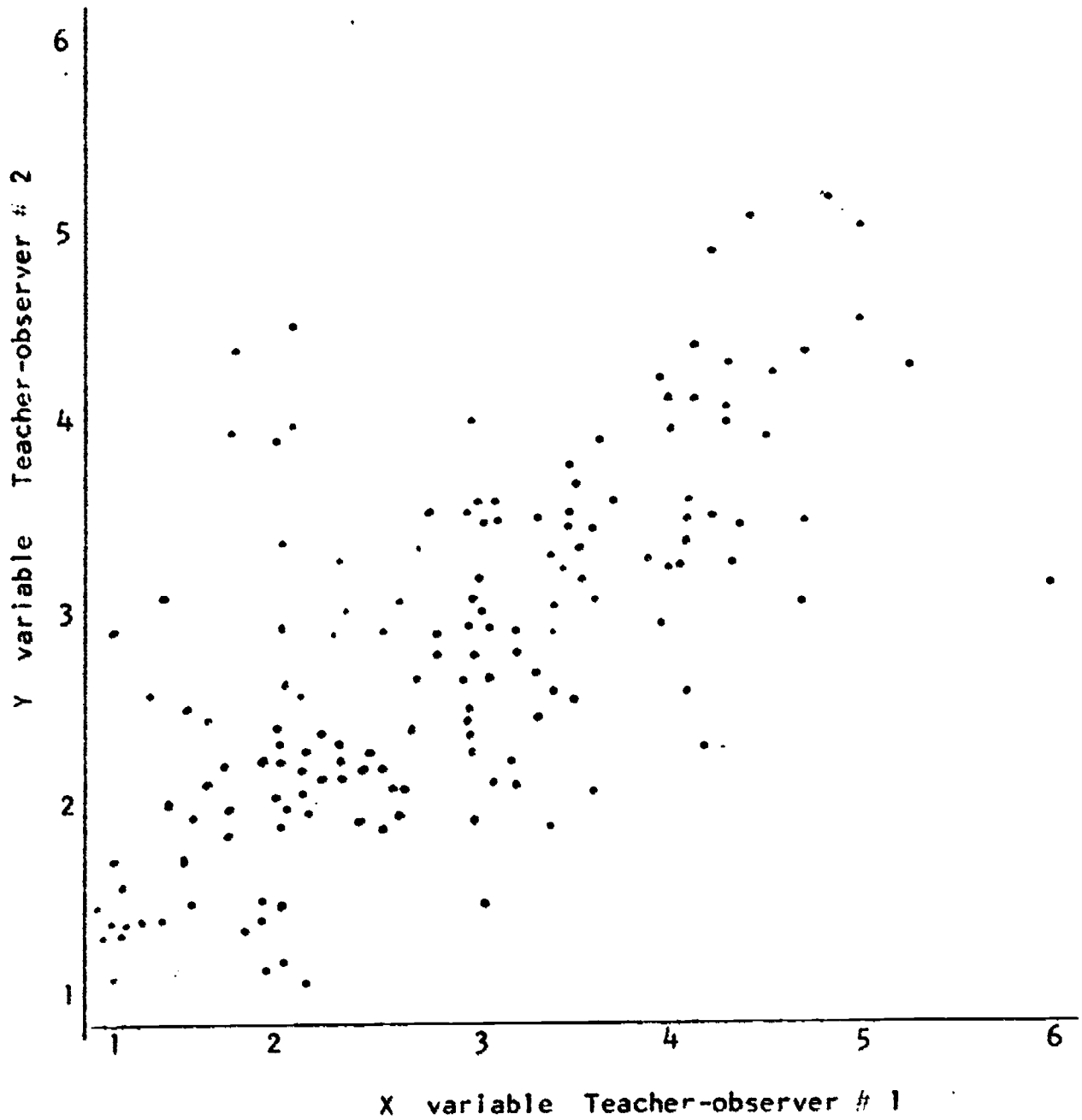


Figure 1. The degree of relationship between scores on the Creative Activities Checklist. The Product-Moment Correlation Coefficient showed the degree to be .81. Regression lines: byx =.94. bxy =.97.

Testing the Hypotheses

The hypotheses evolved from the idea that there would be a positive relationship between scores of young children on three instruments measuring creativity. The three instruments vary as to the approaches taken by the respective researchers. The scores were analyzed by use of Spearman's Rank-Order Correlation Coefficient and Pearson's Product-Moment Correlation Coefficient.

Hypothesis # 1:

It was predicted that a positive relationship exists between creative self-direction as indicated in KELP and creative behavior as indicated by Starkweather. The degree of correlation found was .55 on Pearson's Product-Moment Correlation Coefficient, and .60 on Spearman's Rank-Order Correlation Coefficient. Both correlation coefficients are significant beyond the .01 level of confidence.

Hypothesis # 2:

It was predicted that a positive relationship exists between creative self-direction as indicated in KELP and creative behavior described in the present research (Creative Activities Checklist). The degree of correlation was .50 on Pearson's Product-Moment Correlation Coefficient, and .44 on Spearman's Rank-Order Correlation

Coefficient. Both degrees are significant beyond the .01 level of confidence.

Hypothesis # 3:

It was predicted that a positive relationship exists between creative behavior as indicated by Starkweather and the Creative Activities Checklist developed in the present research. The degree of correlation was .42 on the Pearson Product-Moment Correlation Coefficient, and a .40 on Spearman Rank-Order Correlation Coefficient. Both of these degrees of relationship are significant beyond the .01 level of confidence.

Hypothesis # 4:

It was predicted that creative activities in preschool children can be observed with reliability by educators (1) working with preschool children, (2) taking a course in which the creative process is studied, and (3) using the observation techniques produced for the purpose of the present study. The degree of relationship on the pairs of scores for each child assigned by two teacher-observers showed the correlation to be .81 on Pearson's Product-Moment Correlation, which is adequate to support the hypothesis at this stage of the instrument's development, and a .70 on Spearman's Rank-Order Cor-

relation Coefficient; both are significant beyond the .01 level of confidence. The scatter diagram (Figure 1) illustrates a positive linear direction exists.

Summary

Scores on three instruments measuring some degree of preschoolers' creativity were correlated by use of Pearson's Product-Moment Correlation Coefficient and Spearman's Rank-Order Correlation Coefficient The degree of relationship was sufficiently significant to support the original four hypotheses given in the preliminary predictions of the present research.

The next chapter will present further discussion of the results obtained with some analysis of correlated scores to determine ratings of boys and girls, respectively, for children according to their ages, and correlated scores on KELP for older preschoolers with those of the other two instruments. It will include some comments by teachers who used the Creative Activities Checklist together with correlations of scores for Observation I and Observation II made by these teachers. Finally, it will point out certain implications as to possible future use of the instrument developed for this research that may be significant in the field of early childhood education.

CHAPTER V

DISCUSSIONS, IMPLICATIONS AND CONCLUSIONS

Introduction

The investigator has long been interested in the area of creativity and in the idea that teachers acquainted with research related to creativity and trained in observation techniques could with reliability observe and encourage creativity in preschooler children. This study was prompted by the investigator's experience in working with pre-service teachers in elementary education and with in-service teachers returning to college to finish their degrees.

When these teachers were made aware of the creative process and its implications for education, they showed less tendency to mold children. Instead, they looked for ways of tapping the creativity and directing it into productiveness. Children then became more stimulated and appeared to enjoy school more. When the investigator visited her students, she could sense a different atmosphere in their classrooms.

Philosophical discussions on the relationship between parents' and teachers' awareness of the creativity of young children and the socializing process of education in strengthening or stifling this creativity provided the investigator with historical background for research in creativity and the learning process. The intent of this study was to compare the creative self-direction of preschool chil-

dren. The children were observed through the use of three instruments: KELP (Kindergarten Evaluation of Learning Potential), which measures creative self-direction (Appendix A); Starkweather, which measures the child's psychological freedom to use conforming or nonconforming behavior under the influence of a parent (Appendix B); and the Creative Activities Checklist, which was designed for this study (Appendix C). All three instruments test some characteristics considered creative by researchers. The teachers at the four sites chosen for the study took a class from the Project Director in which they did research and learned how to observe children's creativity through use of these three instruments. Tests of the children's observed creativity was checked after completion of a semester course dealing with the creative process.

The following discussion of the results is organized in terms of: the analyses performed, including further analysis of the data as to sex and age differences, and correlations of the first observation of teacher-observers with a second observation by these same teachers using the Creative Activities Checklist; comments by teachers researching creativity and checking the Creative Activities Checklist; implications for education; suggestions for future research; and a summary of the study with conclusions.

Analyses of the Data from the Three Instruments

The results of the analysis of the data using the Pearson Product-Moment Correlation Coefficient (Table 3) and the Spearman Rank-Order

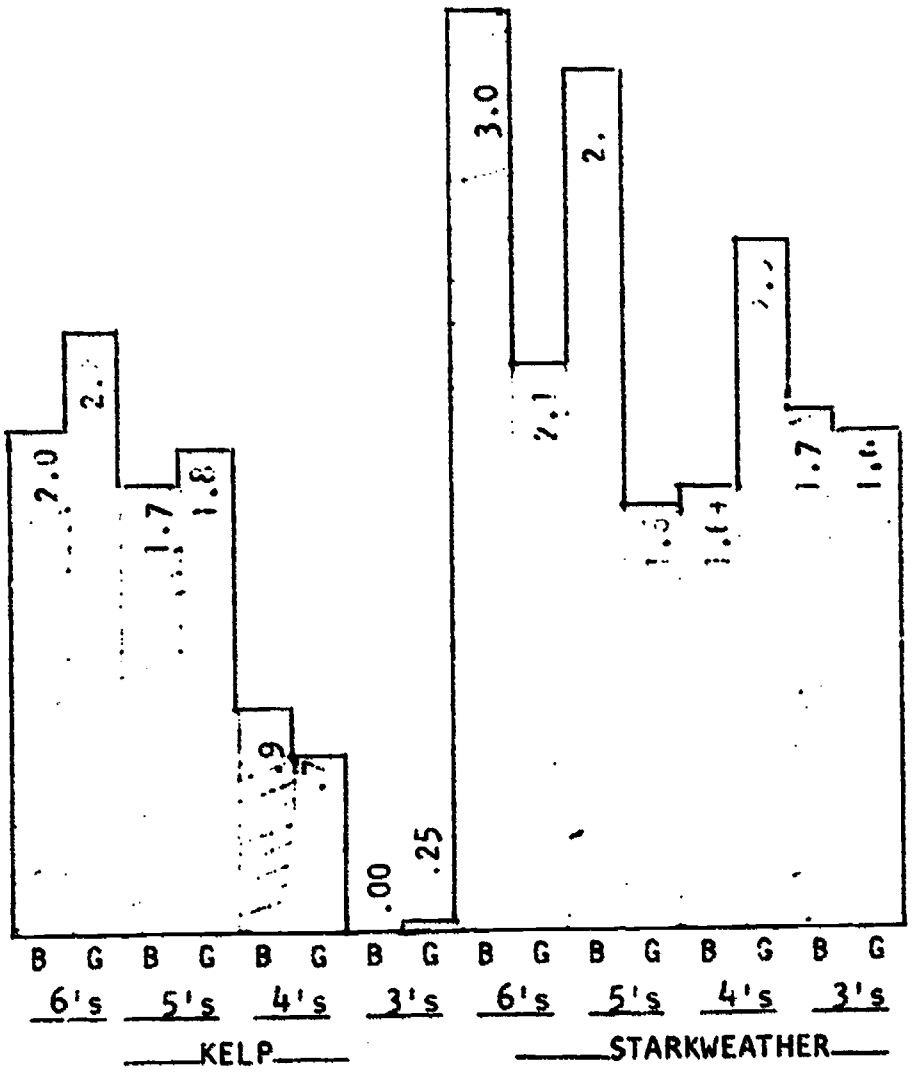
Correlation Coefficient (Table 4) showed that the relationship among all the instruments was significant beyond the .01 level of confidence. The relationship between KELP and Starkweather was .55 on Pearson and .56 on Spearman. To score on Level 3, creative self-direction on the KELP instrument, a child would have to understand the inherent relationship (Level 2--Conceptualization) of the bits and pieces of information he had previously associated (Level 1). Children in the age range of three years and the early four's are still in Piaget's (1964) preoperational or intuitive stage, in which their thinking is very egocentric and largely governed by their percepts. Thus, they could not, for the most part, reach the conceptualization level in use of the KELP items.

A study by Cordis (1971) corroborates this, as it explains that the KELP material was designed originally to evaluate cognitive processes of five- and six-year-olds. Generally the older children, for whom the material was designed, achieved on Level 2 about two-thirds the number of Level 1 tasks, and on Level 3 they had only about one-third the number. In her study of younger preschoolers ($3\frac{1}{2}$ to $4\frac{1}{2}$ years) however, Cordis found that creative self-direction (Level 3) was only about one-tenth as frequent as association learning (Level 1).

The mean scores of the present study (Table 5), comparing younger and older preschoolers' creative self-direction scores, would confirm Cordis' finding. The three-year-olds, who make up only 10% of this study, have mean scores of only .25 for boys and girls together. Four-year-olds, making up 25% of the total group, have low scores of .70

TABLE 5

HISTOGRAM COMPARING YOUNGER AND OLDER PRESCHOOLERS' MEAN SCORE ON KELP AND STARKWEATHER (N = 155)



for girls and .85 for boys. This may suggest that scores on creative self-direction of preschoolers should not be based on materials designed for those in an older age bracket; yet the younger children loved to work with these materials, and teachers could observe much from children's interacting with them. This may account for the degree of relationship found between KELP and those on the Creative Activities Checklist: the relationship was .50 on Pearson and .44 on Spearman. Study of the Creative Activities Checklist (Appendix C) shows many areas that could be observed by teachers as the children interacted with KELP materials. Both instruments measure broad aspects of creativity. Perhaps the variance (about 22%) between the two instruments can be explained through a study of the children's mean scores on KELP (Table 5) and on the Creative Activities Checklist (Observation 1--Table 6) differentiated according to sex and age. Figure 3 shows that, although the younger children of both sexes have much lower scores on KELP, their scores on the Creative Activities Checklist do not vary markedly in the age-sex categories.

Age Group	Sex	KELP	C.A.C.	Percent of population
Six-year olds				
	Boys	2.0	2.8	25%
	Girls	2.2	2.9	
Five-year-olds				
	Boys	1.7	3.1	40%
	Girls	1.8	2.8	
Four-year-olds				
	Boys	.9	2.9	25%
	Girls	.7	2.9	

Three-year-olds				
	Boys	.00	2.9	10/
	Girls	.25	2.9	

Figure 2. Comparison of the mean scores on KELP and Creative Activities Checklist according to sex, age, and percentage of total population in each age bracket.

The .50 and .44 degree of relationship (Pearson and Spearman) between KELP and Creative Activities Checklist could, it appears, be attributed to the older children's scores and the variance due to the scores of the younger children.

The Starkweather test does not measure any such cognitive levels of learning as does KELP. The instruments are alike, however, in that both have an element which limits the choices of a child. KELP requires the child to make his own design, pattern, or explanation of something which would indicate whether or not his thinking processes go beyond the level of instruction--but only with materials (such as beads) selected by the examiner. Starkweather limits the child to choosing only one of two colors each time he makes a choice. The investigator often noted that the younger children, who had comparatively low scores on Starkweather (Table 5), told her that they did not want either of the two colors; they might even reach across the table to take any color they wanted. This type of action merited a nonconforming score each time they did this; but does it show a creative urge or merely a lack of sufficient maturity to grasp the real significance of the assigned task? Indeed, the two instruments may be alike in being

TABLE 6

A COMPARISON OF YOUNGER AND OLDER PRESCHOOLERS ACCORDING TO SEX AND MEAN SCORES AND LEVEL OF SIGNIFICANCE ON OBSERVATION ONE AND TWO USING THE CREATIVE ACTIVITIES CHECKLIST
(N = 155)

Age Groups	Sex	N	--- Mean scores--- O_1	O_2	Difference	t*	p**
Six-year-olds (6:0 - 6:10)							
	Boys	22	2.836	2.900	-.064	.66	n.s.
	Girls	17	2.859	2.971	-.113	.41	n.s.
	Total	39	2.846	2.931	-.085	.78	n.s.
Five-year-olds (5:0 - 5:11)							
	Boys	35	3.177	3.000	+.177	2.04	<.05
	Girls	27	2.777	2.729	+.048	.72	n.s.
	Total	62	3.003	2.882	+.121	1.92	n.s.
Four-year-olds (4:0 - 4:11)							
	Boys	19	2.874	2.932	-.058	.52	n.s.
	Girls	20	3.150	2.915	+.235	1.86	n.s.
	Total	39	3.015	2.922	+.092	1.01	n.s.
Three-year-olds (3:2 - 3:11)							
	Boys	6	2.100	1.800	+.300	1.89	n.s.
	Girls	9	2.420	2.013	+.280	1.31	n.s.
	Total	15	2.290	1.857	+.280	1.61	n.s.
Total (3:2 - 6:10)							
	Boys	82	2.937	2.870	+.067	.93	n.s.
	Girls	73	2.855	2.764	+.091	1.73	n.s.
	Total	155	2.890	2.820	+.070	.57	n.s.

* $t = \bar{D}/s_{\bar{D}}$

** p .05 level of confidence chosen.

adapted to older children rather than three-year-olds. These youngsters, who lacked intellectual maturity to score on KELP, failed to persevere in the task of making the twenty choices required by Starkweather. If an older child, on the other hand, scored zero on Starkweather, it was obvious that he really relished the opportunity to choose either not to conform to a parent's choice, or else to identify with the parent's choice. Variance between the correlation of scores on these two instruments (about 25%) can perhaps be attributed to such children as refused to try the Starkweather choices or to reach a creative self-direction level of learning on KELP. For example, the older children, who seem to lack the intellectual ability on KELP--or perhaps the inclination to try--can be seen through an analysis of the raw data (Appendix F) to have lower scores on Starkweather also. Starkweather tests only one area of creativity--that of psychological freedom to conform or not to conform to parents. To score on KELP, a child must conform, to a degree, in that he follows the suggestion of the teacher-observer to make something on his own. One possible explanation for the positive correlation between the two instruments (KELP and Starkweather) could be due to this conformity.

Another reason for the low scores made by younger children on both instruments can be seen through readings of Smart and Smart (1972); they explain that children in the three- and four-year-old range are still reaching out to finding a sense of autonomy, striving to do things for themselves and in their own way. Immature older children would also be in this stage of development.

Table 5 compares scores for KELP and Starkweather between younger and older preschoolers according to sex. It confirms what several researchers (Starkweather, 1962; Kagan and Moss, 1962; Cordis, 1971) have noted: girls tend to conform more than boys. In the present study, the girls' scores on Starkweather, except for the four-year-olds, indicate less freedom to use conforming or nonconforming behavior when given a choice; girls were also higher on KELP, again except for the four-year-olds, another indication of greater willingness to accede to a teacher-observer's suggestion. Interestingly enough, as Table 6 shows, teachers using the Creative Activities Checklist, rated the four-year-old boys lower on creativity on the second observation than on the first. Only the four-year-old boys showed more conforming behavior on KELP and Starkweather.

The degree of relationship between Starkweather and Creative Activities Checklist was .40(Pearson) and .42 (Spearman). These relatively low degrees of relationship may perhaps be due to the broad range of creativity covered by the Creative Activities Checklist (Appendix C) and observed by teachers during the child's free interaction with his environment in an area he especially enjoys. On the other hand, Starkweather tests only psychological freedom (# 12 on the Creative Activities Checklist). Nevertheless, the relationship is in a positive direction for a child who is not psychologically free according to Starkweather would probably also score toward the inhibited ratings on all levels of the Creative Activities Checklist. Figure 3 will present the mean scores according to age and sex for the two intruments.

Age Group	Sex	Starkweather	C.A.C.	Percent of pop.
Six-year-olds				
	Boys	3.0	2.8	25%
	Girls	2.1	2.9	
Five-year-olds				
	Boys	2.9	3.1	40%
	Girls	1.6	2.8	
Four-year-olds				
	Boys	1.6	2.9	25%
	Girls	2.6	2.9	
Three-year-olds				
	Boys	1.7	2.9	10%
	Girls	1.6	2.9	

Figure 3. Comparison of mean scores on Starkweather and Creative Activities Checklist according to sex, age, with percentages of total population in each age bracket.

Another area of data analysis reported in Chapter IV is related to Hypothesis # 4, which stated that teachers can with reliability observe creative behavior in preschool children if trained in observation techniques and acquainted with research on creativity. Relationship between the two observations on each child is .81 on Pearson and .7 on Spearman. In that all the teacher-observers for the Creative Activities Checklist took a class from the Project Director and helped in determining the items in the list, they were thoroughly

familiar with it. Also at the end of the course, each one, with a teacher-partner, chose a child to score. Later these pairs compared their ratings of the child's creativity and had further discussion with the Project Director and their other classmates (Appendix E) on the meanings of the terms of the checklist as described in the glossary.

A month later, these paired teacher-observers individually scored all their children after again discussing the meanings of the terms. The double set of scores showed a variance of approximately 56% when correlated on Pearson and Spearman Correlation Coefficient. This was doubtless due to the different areas in which teachers interacted with the child, e.g., in art, in creative dramatics, or it may be because of the quality of the interaction as some teachers worked more with one child than with others. An astute observation by one teacher-observer was that he felt teachers often judged the children according to their own self-concept. In this context, one may recall Maslow's (1954) view that deficiency needs, biological as well as psychological, must be satisfied before a person can become self-actualized. Moreover, Bishop and Chace (1972) write of the relationship between the conceptual style of parents and creativity expressed by their children. Harlow (1971) discusses the types of teachers, their adaptive ability and their relationship with children. Although she has no confirming data at present, the Project Director was at times able to predict, from the classroom climate, how certain teachers would rate their students. This could certainly be an area for future research in the area of teacher-training.

A final analysis using the data gathered on the KELP and Starkweather instruments was prompted by the investigator's interest in determining just how the scores, according to age and sex, would correlate. The formula chosen to determine the degree of relationship was Pearson's Product-Moment Correlation Coefficient since the number of scores in each age bracket, except for the three-year-olds, would be beyond the number thirty. The results, shown in Table 7, were surprising. Except for the youngest boys, who had no KELP scores to correlate with Starkweather's, all the degrees were beyond the .01 level of confidence. One explanation for this was the zero scores received on KELP by so many younger children cancelled out the zero scores which they also received on Starkweather while the number of scores under observation remained intact.

Second Observation using the Creative Activities Checklist

Two months after their scoring of the first observation by using the Creative Activities Checklist, the teacher-coservers again discussed the meaning of the terms on the list according to the glossary with their teacher-partner. During the following week, each teacher made a special point to observe each child; at the end of the week they again separately scored each child. These scores for each child were computed to determine the composite mean so as to compare with the first observation. Each child now had six scores; four from the observations of the teachers, and two composite scores for the two observations (Appendix G). Use of the Pearson Product-Moment Correlation showed

the relationship between composite scores for the observations to be .79, (p .01). Figure 4 shows the direction of this relationship to be in a positive direction. The Creative Activities Checklist appears to have test retest reliability, at least according to the conditions described in this study. The internal consistency of the instrument was further analyzed by a computation of a split-half analysis on the first half (7 scores) with the second half (7 scores). The split-half analysis was computed as follows: From a total of 620 scored checklists (four for each child in the study), a random sample of 22 was drawn. A mean score for each half was computed and correlated through the use of Pearson's Product-Moment Correlation Coefficient; the realtionship was found to be .97. Another sample, this time of 39 of the checklists, was treated as above except the computation chosen was the Spearman Rank-Order Correlation Coefficient. The relationship between the first and second halves of these checklist was shown to be .96. A value of .254 is needed for .01 level of confidence on Pearson (Freeman, 1966, p. 348). Since both of the above degrees of relationship are significantly beyond the required values, the internal consistency of the instrument between items was considered adequate, at least for these two samples.

Figure 5 will present a sample of the computation of the split-half analysis by the use of the two formulas. The Spearman formula provides for tied ranks.

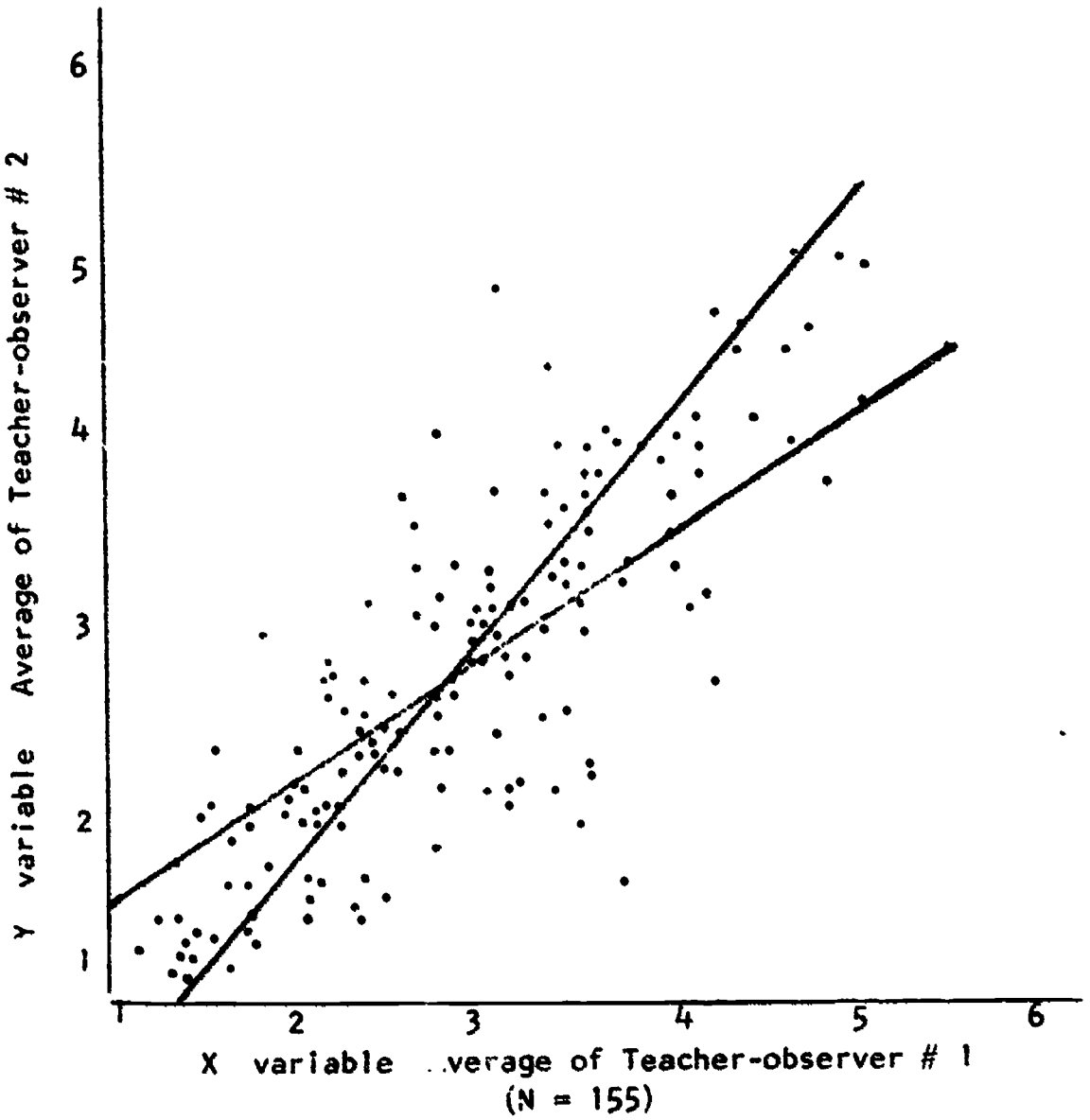


Figure 4. Degree of relationship between scores on the Creative Activities Checklist on two observations. The Product-Moment Correlation Coefficient showed the relationship to be .79. Regression coefficient: byx = .84. bxy = .70.

Pearson s formula

$$r = \frac{N(\Sigma XY) - (\Sigma X)(\Sigma Y)}{\sqrt{[N(\Sigma X^2) - (\Sigma X)^2][N(\Sigma Y^2) - (\Sigma Y)^2]}}$$

N = 22

Spearman's formula

$$rho = 1 - \frac{6(\Sigma d^2)}{N(N - 1)}$$

N = 39

X	X^2	Y	Y^2	XY	X rank	Y rank	d	d^2
4.0	16.00	4.9	24.01	19.60	3.6 30.0	3.3 29.5	.5	.25
3.7	3.69	3.5	12.25	12.95	4.0 38.5	3.4 32.5	6	36.00
2.3	5.29	2.4	5.76	6.24	4.3 36.5	3.3 29.5	7.	49.00
2.6	6.76	2.4	5.76	6.24	3.0 26.0	3.0 24.0	2.	4.00
4.6	21.16	4.6	21.16	21.16	3.1 28.0	3.1 26.5	1.5	2.25
3.4	11.56	3.3	10.89	11.22	4.4 35.0	3.9 36.5	1.5	2.25
2.7	7.29	2.6	6.76	7.02	4.0 38.5	3.6 35.0	3.5	12.25
1.7	2.89	1.7	2.89	2.89	2.6 19.5	2.6 19.5	0.0	0.00
1.4	1.96	1.6	2.56	2.24	1.0 1.0	1.0 1.0	0.0	0.00
3.3	10.89	3.6	12.96	11.88	3.9 33.0	2.7 27.5	5.5	25.25

Figure 5. Sample of the computation of the split-half analysis completed through the use of two formulas with samples of 22 and 39 checklists to validate the internal consistency of the items on the Creative Activities Checklist.

Tables 7 and 8 present the results of computation of correlation coefficients using Spearman's and Pearson's formula for the mean scores between Observation #1 and Observation # 2 for each pair of teacher-observers. The information is given according to sites. The range of correlations through use of Spearman's Correlation Coefficient is from.91 to .72, while on Pearson's Correlation Coefficient the range is .90 to .67. All of the teachers in the centers had higher correlations than did their aides or Teacher-observer # 2, except at the Jack and Jill Kindergarten. Interestingly enough, this is the only site where Teacher-observer # 2 is not an aide but a teacher; she teaches art.

TABLE 7

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENT SCORES BETWEEN OBSERVATIONS OF TWO TEACHERS AND ACCORDING TO THE FOUR SITES (N=155)

N	Ave. Age		Mean Scores: Teacher # 1 O_1	Teacher # 1 O_2	Teacher # 2 O_1	Teacher # 2 O_2	Average O_1	Average O_2
			SITE # 1 Jack and Jill Kindergarten					
31	5·8		2.9	3.2	2.8	2.7	2.8	3.0
		r	.79		.83		.90	
		p	<.01		<.01		<.01	
			SITE # 2 Headstart					
75	5:3		3.0	3.1	3.1	2.8	3.1	2.9
		r	.83		.85		.90	
		p	<.01		<.01		<.01	
			SITE # 3 United Tribes Kindergarten					
12	5:6		3.1	3.5	3.1	2.7	2.9	3.2
		r	.93		.74		.94	
		p	<.01		<.01		<.01	
			SITE # 4 Daycare					
37	5:7		2.5	1.8	2.4	1.8	2.4	1.8
		r	.82		.67		.70	
		p	<.01		<.01		<.01	

TABLE 8

SPEARMAN RANK-ORDER CORRELATION COEFFICIENT ACCORDING TO FOUR SITES ON SCORES BETWEEN FIRST AND SECOND OBSERVATION USING CREATIVE ACTIVITIES CHECKLIST
(N=155)

N	Ave. Age	Median Scores: Teacher # 1 O_1	Teacher # 1 O_2	Teacher # 2 O_1	Teacher # 2 O_2	Average O_1	Average O_2
		Site # 1 Jack and Jill Kindergarten					
31	5:8	2.9	3.3	2.4	2.2	2.9	2.9
	rho	.80		.86		.87	
	p	<.01		<.01		<.01	
		Site # 2 Headstart					
75	5:3	3.0	3.1	3.1	2.8	3.1	2.9
	rho	.79		.72		.79	
	p	<.01		<.01		<.01	
		Site # 3 United Tribes Kindergarten					
12	5:6	3.1	3.5	3.1	2.7	2.9	3.2
	rho	.91		.80		.89	
	p	<.01		<.01		<.01	
		Site # 4 Daycare					
37	5:7	2.5	1.8	2.4	1.8	2.4	1.8
	rho	.83		.74		.70	
	p	<.01		<.01		<.01	

Comments by Teacher-observers on Use of the Creative Activities Checklist

In her years of experience preparing future teachers and working with in-service teachers, the Project Director has seen the climate in classrooms change after teachers were alerted to the advantages of encouraging creativity. Comments such as, "I was getting into a rut, but now students are asking parents to come to school for a visit because it is now so much fun" (Grade 2 teacher). Again, "I thought everything would be chaotic if I gave my students more freedom, but I find them to be very responsible and able to make real choices. Teaching is more fun now" (Grade 4 teacher). Or, "I have even changed as a person! My family have noticed the change" (Grade 6 teacher).

Comments like the ones above prompted the approach to the problems which is reflected in the statement of the problem in Chapter I. In pursuit of an answer to the questions, the Project Director drew up the Creative Activities Checklist which teacher-observers used twice in recording the observed behavior of their students. Following the second observation, the teachers filled in the following form:

One of the questions generated by the Project Director of this research was:

> If parents and teachers were more aware of the creative potential of the child, would they be less likely to mold children into social conformity?

Please answer the following question concerning your feeling of the above question now that you have used the Creative Activities Checklist in scoring your students as to their observed behavior. Did you become more aware of the creative behavior of children. Do you look at the child's behavior in a different way?

Below are direct quotes taken from the evaluation forms. The students are identified according to their listings in Appendix E.

F 007 "Yes, I do feel that I am more aware of the creative behavior of my students. It has also helped me accept creative behavior from them. I find I am not trying to mold them all into one pattern and am allowing for more individual differences. I think it is an effective instrument."

F 018 "Yes, I think I have become more aware of the children's creative potential. However, I think there must be a suitable medium between allowing the children to be creative and having discipline. I think it is good to look at their creative behavior within set limitations--setting limitations so that the classroom does not become chaotic. I think it would be interesting to observe just one or two children at a time for creativity when I would have more time to concentrate on just that one."

F 01 "I don't think I am more aware of the creative behavior now than I was before; although, I will admit the checklist does make you think more."

F 013 "Yes, I have noticed that many of the children I work with are very creative. After going through these observation records again, I became very much aware of the fact that the children I thought weren't creative are really very creative. I observed just the behavior before, but now I link it with creativity. I feel it is easier

for me to understand the children now."

F 005 "Definitely,. . . .they would understand him for the brillant child he is. This would make him a richer child. Yes, I feel I would look at the child's behavior in a different light in many ways. I feel I've changed my opinions from the first scoring to the last scoring. This could be because I feel I have changed also. I'm really trying and doing more creative things. We did many booklets on the children pretending they were different things; such as fish and animals, etc. We had the children draw their feelings, and also verbalize them to us. I feel we started to spend more time on our surroundings and to use our senses more. It has definitely made me more aware of the nonconforming child, and to respect him for his feelings. It definitely made me go out in many more directions with my thinking, instead of staying in one narrow range. I think I really try to be more creative now and hence allow creativity to develop in my children."

F 009 "The teachers would be less likely to mold the child because they would see that everyone is an individual and that children want to be treated as individuals. Yes, I am much more aware of creative behavior. I watch the children more closely to see what they really enjoy doing and try not to force them to do things they don't enjoy, unless it is a behavior I am trying to change."

F 008 "Yes, I became more aware of the creativity of a child and was more willing to let him pursue his creativity. I found myself seeing more areas of learning in the activities I taught or activities the

child brought to the class. One of the things I started this year, after our course on creativity had ended, was to set aside some time, within the class period, for each child to share a rhyme, song, experience, even riddles and jokes which the children love. Also, when a child brings a book for 'Show and Teli' and asks me to read it to the class, I learned this year to say, 'I'll hold the book and turn the pages, but you may tell us the story.' At first they are very shy, but soon they learn to tell a story in their own words. Another thing I introduced to the four- and five-year-olds are jig saw puzzles. I find now they are so good at them that they mix three or four together as a challenge to themselves in putting them together. Thank you."

F 016 "If parents and teachers realized what and whom they are handling while raising a family or educating them, their approach and their views of their children would be quite different. The children would be viewed as unique individuals with rights and needs of their own; they would strive to strength a positive self-concept in their children, for without this, an individual is nothing. Having gone through the creativity activity sheets twice now, I have had to assess myself as a teacher's aide and also as a person in how I am reacting to and handling the five-year-old children in my Headstart room. In particular there is a boy I rated very creative by the Creative Activities Checklist definition, for he daydreams and is inattentive. I must ask myself if I am meeting his needs and stimulating him. The checklist has given me an answer: the child is creative, but the

environment surrounding him has not been enticing enough for him to listen, and thus he does need stimulation."

F 011 "I most definitely feel that one of the greatest tasks that we can do is to educate our parents and teachers to become more aware of their childrens' potential for creativity.

Many parents would be shocked to discover that traits that their child possesses may not be 'the stubborn streak inherited from their mates' side of the family,' but may actually be a plus or positive trait if acknowledged, understood and channeled correctly. Teachers also most 'urgently and definitely' need creativity training. To me it is a must! Only then can they really began to teach, which means 'to help each child to reach his full potential.' Only by being continually aware of the characteristics of a creative child can you help him to reach this level.

Even though I began teaching years ago, I always 'had a feeling' that what I was doing was or seemed 'right'. But even though I may have been doing some things right, I certainly didn't always know why! These last years I have been very much aware of the importance of creativity. I feel that this checklist has been great in not only being able to understand my children better, but in fact, that after my aide and I scored the children individually, we were then able to sit down and take a good look at why we rated each child as we did. This is very beneficial in planning as we are then able to emphasize the positive, and thus reduce the negative."

Such positive statements as these speak for themselves; moreover, the Project Director could confirm the increasingly vibrant atmosphere in the classroom and the eagerness of the teachers to share new discoveries. The results (Table 6) of analysis of the differences between means of the first and second observations based on the Creative Activities Checklist, although not significantly different, do show that, for the most part, the second ratings indicated teacher's receptivity to children's increased creativity.

Implications for Future Education

Prior to examining the implications for early childhood education, the limitations of the study must be reviewed. The study was conducted at four preschool sites in Bismarck, North Dakota. Teachers and students in education took a class on creativity and worked with the three instruments under observation; no parents of the children being studied took part in the project.

According to Starkweather (1965), "a study of the development of creative ability logically should start with a study of infants; however, such an approach has been impractical because of the elusive and complex nature of creativity" (p. 18). Therefore, children in the age range of 3:2-6:10 were used.

Although scores on all three levels of KELP(Association, Conceptualization, Creative Self-Direction) were assigned by teacher-observers, only Creative Self-Direction scores were used in this study: hence, the self-determining tendencies of the child were apparently being separated

from purely cognitive and psychomotor levels—but is this truly possible? Relevant in this regard is the statement of Peter Berger (1967):

> It is at once evident that primary socialization is usually the most important one for an individual, and the basic structure of all secondary socialization has to resemble that of primary socialization. Every individual is born into an objective social structure within which he encounters the significant others who are in charge of his socialization. These significant others are imposed on him. Their definition of his situation are posited for him as objective reality. He is thus born not only into an objective social structure but also an objective social world. The significant others who mediate this world to him modify it in the course of mediating it. They select aspects of it in accordance with their own location in the social structure and by virtue of their individual, biologically rooted idiosyncrasies. (p. 131)

One of the most obvious implications for early childhood education of the future lies in the area of parent-teacher education, especially for better understanding of the affective domain of the child.

Both teachers and parents need to be alerted to the results of such instruments as those used in this study, and the importance of keeping abreast by continued reading, for "only he who can remain a student forever will be a good teacher forever" (Eckstein, 1969). Too long have academics emphasized the intellectual domain; for all learners, the young even more than their seniors, teachers and parents must take into account other levels of human development. Accordingly, it is appropriate to examine the findings on KELP by some representative college students who used it. They were juniors in education who had never taught, but became quite perceptive as can be seen in their comments quoted below. The comments, taken from their final report to the Project Director, are

identified as teacher-observers (Appendix E) and children under study (Appendix F).

Teacher-observer F 032: Student M 018, in working with beads and making designs, showed good small motor coordination. He made some of the letters wrong. At first he seemed anxious to return to his room, but soon became so absorbed in his work that he forgot about the time. Student M019 could reach all levels except creative self-direction on the beads. He would simply put any shape or color together; nor could he really understand the idea of patterns. He was very aware of the color names but showed reversals of the numbers. Although he knew the months and days, he said Sunday was church day and Saturday was cartoon day. He was very quiet and never talked unless I asked a question; even then would often ignore me and simply keep on working. It was very frustrating! Once I deliberately put a bolt in the wrong hole on the bolt board to see if he would verbalize why it was wrong. He would play with the right one, but he would not tell me to take that one. A teacher would certainly have to gain his trust before she could work with him. Just once I saw him excited. I had asked him about the boat and if he had ever had a ride in one; he got very excited and began to talk but soon stopped and seemed inhibited again. I feel he has the mental capacity to do excellent work, but a teacher would have to work on strengthening his self-worth--or as Maslow expressed it--make each step forward more subjectively delightful than the backward step to safety and not interacting.

Teacher-observer F 028: Student M 024 is smarter than a whip! He

knew his numbers exceptionally well and could count to 200. When I asked him what would make a 5, he readily said: 6-1; 3+2; 4+1, etc.--really smart kid! Although he had no trouble on Levels 1 and 2 on block designs, he was completely stumped when I asked if he could make a design of his own. I showed him some I had made and he seemed interested. I think I'll try the block design again next time I work with him. His motor control was good as I saw as he wrote his name. He caught on right away to the auditory and could put the toys in the correct boxes with no trouble; nor did he have trouble thinking of other words that began with that sound. I feel he is an extremely bright boy, but I am wondering and asking myself, "What will become of him when he goes into a traditional type of classroom where all students are expected to learn in groups and about the same things?" Student F 028 reversed and inverted some letters. She is very quick at auditory perception and could easily be taught to read by this method. She could spell other words besides the signs, e.g. her little sister's name, their dog's name. She is ready to begin reading, especially by the language experience method, with some phonics method incorporated.

Teacher-observers F 032: Student F 027 showed very good muscle coordination but was easily distracted by other children working around her. She always wanted to do what they did, but I when I allowed this, she lost all interest. She seemed to have trouble with auditory perception, so perhaps her hearing should be tested. Student F 030 is very well-rounded. When doing the bolt board, she made such observations as to why certain bolts went into certain holes, saying, e.g., it is

the fattest in the whole world, or it is skinnier than that one, or it is the skinniest. In working with signs, she said that SLOW meant that a red light was probably coming up. Student M 029 is full of questions; he has good muscle coordination and also becomes completely involved in the materials. M 028 has very poor muscle coordination as was noted in his manipulation of the beads, especially the spheres. He said it was Fun Friday and wanted to go back to the room as soon as he came to me; in fact, he seemed overanxious about missing any part of the work in the classroom and said he was afraid of getting behind the other kids. He had a rough time with articulation, saying such things as "nana" for banana. Student F 027 had little trouble with the blocks but kept looking at me for reinforcement. In fact, in everything she tried she'd ask for assurance as to whether she was doing it right. She will certainly need an understanding teacher to help her feel intrinsic success and want to learn for the simple pleasure of doing so.

The above observations of the students preparing for a teaching career indicate that they have an understanding of how different children learn at different rates and in different ways. Would not such teachers as these search for methods of individualizing and humanizing their classrooms?

The Starkweather test was used by the Project Director to test the child's freedom to conform or not to conform. Teachers often asked to observe her as she tested children. Various aspects of a child's personality appeared in the course of the so called "game". After a child had chosen certain colors for their pages, the observer, at times, could almost predict how the next choice would be handled. Discussion

after the test confirmed that this instrument indeed tested an aspect of the child's personality that teachers could observe as they interacted in the classroom. Once teachers are aware of this aspect, could they not arrange to present the child with choices to allow him to become mentally unfettered yet responsible in making decisions?

The use of this instrument has implications for parent education also. Eble (1968) has shown the socializing aspect of learning which parents can recognize and foster; he says, "Learning begins in delight and flourishes in wonder. Surely the greatest gift a parent can give a child, once heredity has done what it can, is to let that child experience the delight of learning. Response is everything. Parents worry too much, and probably the more education they have, the more they worry. No parents could be more concerned with education of their children than American parents. And yet that very concern often discourages the delight in which all learning should begin" (p. 3).

The third instrument was the Creative Activities Checklist drawn up during a course on creativity. An implication for education would be its use by teachers researching creativity. They might begin by making a checklist of their own. One of the teacher-observers in the study, F 011, brought the following list to class as characteristics of creativity she had found by reading: spirit of wonder and magic, adventurousness, questioning why, free to be conforming or nonconforming, watchful for sounds and smells, looking twice, attempting the difficult, willing to take a risk, tolerant of chaos and ambiguity, looking at things in a different way, making productive use of silence and hesitation, l'king

to manipulate and explore, fantasizing, known for silly or wild ideas that do not always conform to standarized dimensions, producing the humorous and playful, persistent, highly energetic, able to think in terms of possibles, richly imaginative, questioning the accepted, considering the improbable, self-confident, forceful of character, strongly affectionate, aware of others, always baffled by something, attracted by the mysterious, desiring to excel, determined, emotionally sensitive, individualistic, making mistakes or regressing occasionally, self-assertive, self-aware, sensitive to beauty, striving for distant goals, stubborn at times when unable to accept conventions, unconcerned about power, thorough, visionary, versatile. Would not teachers who have done such thorough research in this area be better teachers because of it?

The previous research, reported above in Chapter II, lists several studies that deal with the conceptual system of teachers and parents (Greenacre, 1959; Harvey, 1961; Dryer and Weiss, 1966; Harlow, 1971; Doyle and Chace, 1972) and with the creativity expressed by their children. Would it not be advantageous for professors in teacher-preparation to be aware of the varieties of conceptual systems and encounter-type which characterize students interacting with their pupils before admitting the students to teacher certification?

In their class on creativity, students wrote on a research question in which they delved into the private world and its implications for adults working with children. The following excerpt from one of the papers stresses a teacher's awareness of children and their need for sensitivity and concern. She discusses her concern for each child; however, only one will be used in this study:

> I feel that through my experiences over the years, I am able to emphasize with students and their parents because I truly do care. When Annette, age 4, tells me "I don't like you, I don't even like your husband and I don't like your children,"I can realize that because of the circumstances that she is now living under and which she is not able to undersand or cope with at this age, I am able to tell her, "I understand how you feel," as I know why she is lashing out at me. When her father was put in prison and the family were left desolate, I took them into my home. She has seen the security of my family while her own has been disrupted. . . . . I feel, that if I can somehow convey the message that I am trying to understand their problems, only then can I help. . . I feel that without this empathy, we as teachers are ineffective in the total program of teaching. We must examine our private world and in doing so, reflect on this quote by Robert Mager "A child who knows his teacher cares, stands taller than he thought he could."
>
> (Mager, 1970, Developing Attitudes Towerd Learning)

The awareness of the type of teacher sent to the classroom is of pivotal importance if the children are to be helped and the challenge of parents and governments to be met when they ask that creativity not be stifled and that early childhood education programs prove their effectiveness.

Another implication for education would be to use the Creative Activities Checklist with teachers in other areas of education such as the elementary and high schools. This could help teachers and parents evaluate their children and look at the total aspect of education. This list has already been used by several teachers to rate their own children and other members of the families as well as themselves. Once they are aware of their own subjective reality, they can allow for their children to grow into self-actualizing human beings (Maslow, 1971).

Hopkins (1970) claims that creativity can be developed with practice, for everyone has creative potential. She feels that abilities that surface must be encouraged and that sleeping ones must be awakened. She

asks, "Where could this activity be better undertaken than in the schools?" (p. 3).

If people come to understand the significance of creativity (through the Creative Activities Checklist) and realize the potential for helping develop healthy, truly human beings, teachers will realize their responsibilities to delve more into the literature, seeking ways to foster this creativity and to use their own powers to find means within the curriculum for doing this. Torrance (1970) warns: "Teachers are in a position to kill the creativity dormant in children or to stimulate it and promote it." (p. 32). As Hopkins comments, "With the beginning of school, however, they find themselves forced to fit into the mold provided, to be like 'everyone else'. This is such a devasting experience that by fourth grade children are afraid to deviate from the acceptable path. Little by little the spark of creativity dims until finally it is snuffed out entirely and the child becomes one of the 'good' children--nameless, conformed and creatively dead" (1970, p. 5).

The Project Director has noted that most of the current materials concerned with any aspect of education deal to a great degree with these two areas of teacher and parent education; e.g., some titles received by her in recent months for review would be: G. Weinstein and M. Fantani, Toward Humanistic Education: A Curriculum of Affect, (1970); H. F. Beechold, The Creative Classroom, (1971); K. Yamamoto, The Child and His Image, (1972); G. I. Brown, Human Teaching for Human Learning, (1973); G. A. Castillo, Left-Handed Teaching: Lessons in Affective Education, (1974). If teachers, whether in pre-service or in-service education, have had

background work in affective and humanistic education through the use of the three instruments used in this study, they should be able to read the above books with greater perceptiveness.

Implications for Future Research

The above study brings to light many areas that need further research in the area of Early Childhood Education. The following suggestions are only a few of the possibilities

1. The most obvious need is a longitudinal study of the children whose parents and teachers researched the area of creativity and worked with the Creative Activities Checklist in order to determine if these children are better-adjusted, better-rounded children. Are they able to take responsibility for their actions and look at the uniqueness of themselves and others, able to confirm (Buber,1965) the other's uniqueness in their interaction with them?

2. Research on the five-year-olds after a year of school (1974-1975) to determine if the teachers still allow them freedom; observations would be based on the Creative Activities Checklist. (Table 6, p. 60, shows that the second observations of the five-year-old boys allowed for a difference beyond the .05 level of confidence).

3. Research as to why the boys in the four-year-old bracket (Table 5) showed more conforming behavior on KELP and Starkweather, and less creativity on the second observation using the Creative Activities Checklist (Table 6). Is this a chance happening, or would a replicated study show the same trend?

4. Research as to why the six-year-olds showed less creativity on the second observation. Did this happen at all the centers, or did the type of classroom seem to bring this about?

5. Presentation of the findings of this study to parents, showing the difference between boys and girls; later a test might be devised which would show if there is a difference in the socializing process produced by such parental awareness.

6. Research on affective education, e.g. a test could be given to students whose teachers took part in this study--a semantic differential type of test or the Gumpcookie test--at the end of the kindergarten year and again at the end of the first grade. A control group and an experimental group could be set up. One group of first grade teachers could be trained in the use of the Creative Activities Checklist while the control group would not have access to this material or to this study.

7. Scores on the Creative Activities Checklist could be correlated with scores the students received on the Metropolitan Test of School Readiness. This could help to determine whether the creativity scores the students received were based more on the teacher's expectations of the academic ability of the child or on the child's unique approach to education.

8. Students in beginning statistics could use the scores of the study and do further research, e.g., one students asked the Project Director for the KELP scores on creative self-direction for the Jack and Jill Kindergarten. She used these scores with Spearman's formula to correlate them with the scores the child received on the Metropolitan

Test. Her findings were most interesting: the boys' scores showed a relationship of .56 ($<.05$), while the girls' scores yielded the relationship to be .25 (n.s.). She is now planning to do further research and observation to see if she can determine why the girls show a much lower correlation between scores on the two instruments. Other students have suggested some further research they would like to do with their students by using some of the data from this study. If these students continue to have such an interest in setting up research questions for themselves, they will continue to grow as teachers.

Summary

The purpose of this study was to compare the creative self-direction, the creative behavior, and the creative activities of preschool children. The creative abilities were identified through the use of three instruments: Kindergarten Evaluation of Learning Potential (KELP) to test creative self-directed learning; Starkweather Test of Conforming and Nonconforming Behavior to measure the child's psychological freedom when given a choice; and Creative Activities Checklist (an instrument designed for teacher and parent training) to measure broad aspects of creativity in day-to-dav behavior of children.

Items suitable for a Creative Activities Checklist were gathered through analysis of previous research on creativity. After this tentative checklist had been checked for teacher-observer reliability in a pilot study, it was field tested on a sample of 155 children, 82 girls and 73 boys (aged 3:2-6:10), located at four sites in Bismarck, North Dakota.

Correlations of the degree of relationship among the three instruments were computed using Pearson's Product-Moment Correlation Coefficient and Spearman's Rank-Order Correlation Coefficient. Internal reliability of the Creative Activities Checklist through a split-half analysis was computed.

Analysis of the data using the Pearson and Spearman formulas showed the degree of relationship among the three instruments to be beyond the .01 level of confidence. Correlations of mean scores of teacher-observers on the Creative Activities Checklist showed the degree to be be .81 on Pearson and .70 on Spearman. Further analysis of the data as to the difference between boys and girls showed that girls were more conforming on Starkweather and also showed higher scores on KELP. A second observation of the children through the use of the Creative Activities Checklist was undertaken after a period of two months. The degree of relationship between the two observations was .79 ($< .01$) on Pearson's Product-Moment Correlation Coefficient. An analysis of the difference between means on the the two observations showed that, except for the six-year-old boys and girls, and four-year-old boys, all children showed a greater degree of creativity on the second observation. The split-half analysis of the Creative Activities Checklist on two random samplings of the total checklists for the 155 children yielded relationships of .97 on Pearson and .96 on Spearman.

Conclusions

1. Teachers and students working with the three instruments in

this study can become more aware of the total education of the child: cognitive, affective and psychomotor.

2. The Creative Activities Checklist is a valid instrument for measuring small children's creativity. Through its use, teachers should become more aware of the creative potential of the child.

3. The Creative Activities Checklist is of value in alerting teachers (including parents) to the significance of creativity and some means of fostering it in the very young.

APPENDIX A

DESCRIPTION OF ITEMS IN THE KINDERGARTENT EVALUATION OF LEARNING POTENTIAL (KELP)

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The Kindergarten Evaluation of Learning Potential (KELP) is a new approach to the classification of kindergarten children according to their probable success in first grade. It consists of a battery of 11 items of which all but two tap three levels of learning ability. The items are taught by the kindergarten teacher in day-to-day work with children. The teacher observes and records the success of the children as they use these materials, and as a result is able to predict their probable success in the early primary grades.

The KELP consists of the following items.

1. Skipping: During instruction in rhythms and games, the teacher observes the ability of the child to skip on alernate feet.

2. Color identification: The children are taught ten color names during easel painting and other typical activities.

3. Bead design: Success at level one requires the children to copy five bead design cards, each having eight or nine beads and two or more repetitions of the patterns. At level two, the child is asked to reproduce one of the designs from memory and at level three, he creates a design of his own.

4. Bolt board: This item consists of a wooden stand having holes of diminishing sizes with bolts and nuts to match. Level one requires

the child to take apart, mix, and assemble the bolt board. To attain level two he explains the principles on which he worked. Level three requires that he show his own organization, either in dismantling, or in sorting the bolts for assembly.

5. Block design: The child arranges nine colored blocks to match a pattern on which similar blocks are printed and at level two does the same task when the pattern is miniaturized and the outlines are removed. At level three, he makes a design of his own.

6. Calendar: Discussions based on the typical kindergarten calendar provide a situation in which the child demonstrates, at level one, his ability to describe the date and the weather in a complete sentence. At level two he demonstrates knowledge of the sequence of the days of the week. At level three, he is required to know the social significance of one of the holidays.

7. Number board: These are plastic pieces of different lengths having the top surfaces embossed with units and the appropriate numerals. Level one requires the ability to count to ten and to recognize the numerals when presented in random order. Level two requires that the child demonstrate understanding of the interrelations of the numbers up to five. At level three, he independently arranges and develops different groupings of eight and nine.

8. Safety signs: Seven play-size signs are used to elicit responses basic to parts of reading readiness. At level one, the child reads or dramatizes correct recognition of five signs; at level two, he reproduces a sign from memory; and at level three, he uses the letters available to make words of his own.

9. Printing: At level one, the child learns to print his name in manuscript from the teacher's model; at level two, he prints his name with capital and lower case letters without a model; and at level three, he prints words on his own initiative as needed in drawing or other work.

10. Auditory discrimination: This item consists of 15 small toys whose names begin with one of three consonants. At level one, the child identifies the articles with names correctly articulated. At level two, he sorts the articles according to beginning sounds; at level three, he thinks of other words that begin the same as any of those taught.

11. Social interaction: At level one, the child can report accurately what happened in a conflict situation. At level two, he can apply in a new situation any of the rules, agreements, or standards of behavior in the kindergarten. At level three, he acts on the rules he can express verbally.

taken from:

Educational and Psychological Measurement. Vol. XXIV, No. 2, 1964.

APPENDIX B

EXCERPTS FROM THE RESEARCH OF STARKWEATHER ON THE DEVELOPMENT OF AN INSTRUMENT FOR THE MEASUREMENT OF CONFORMITY AND NONCONFORM- IN PRESCHOOL CHILDREN

An instrumen[t] veloped for the measurement of conforming and nonconforming behavior should provide the child with an opportunity to make a choice in a situation in which he can follow a model or respond freely according to his own preferences.

Color Preference Task

A color preference task, designed for the measurement of social conformity and nonconformity, consisted of three steps: (a) Each child indicate[d] his color preferences by ranking 13 colors. From this ranking, five colors which ranged from first choice to last were chosen for use in the subsequent steps of the research. (b) Each child indicated the strength of his color preferences by selecting the color he preferred when the five colors were presented to him in pairs. (c) Each child then made color selections when there was an opportunity to conform to his parents. In this last step, a control group of children made color selections with no opportunity to conform.

Color Preferences:

A color wheel, consiting of 13 different colored strips of paper attached to a cardboard disc, was presented to each child. He ranked the colors by tearing off the one he liked best, and

then repeated this, one color at a time, until all colors had been torn from the wheel. The five colors which a child ranked 1, 4, 7, 10 and 13, were then used for this part in the rest of the test. The children were then given an opportunity to conform to parents while constructing a picture booklet. First, the child chose the parent he would like to have the investigator make a booklet for; then three identical pages (e.g., the picture of a cow on a red page) were placed before the child, and he was told that this was for his parent. He was then given his choice between a page identical to that of his parent and a page of different color (e.g., the picture of a cow on a blue page). Again the five colors designated for each child were arranged in pairs, each color being paired with every other color twice.

These were presented to the child in such a way that he had an opportunity to choose between red and blue, for example, when his parent recieved red and again when his parent received blue.

CHOICES OF COLOR PAGES IN MAKING BOOKLET

	C.	N.		N.	C.
1.	1	4	11.	7	10
2.	7	10	12.	1	4
3.	13	1	13.	13	7
4.	7	4	14.	10	11
5.	10	13	15.	4	13
6.	1	7	16.	1	7
7.	4	10	17.	10	13
8.	13	7	18.	7	4
9.	10	1	19.	13	1
10.	4	13	20.	4	10

The assumption underlying this design was that the child who really preferred one of the two colors, would choose that color on both occasions if he were free to use conforming or nonconforming behavior, whereas the conformist would choose the preferred color only when his parent received it, and the nonconformist would choose the preferred color only when his friends did not receive it.

Scoring

The scoring consisted of a simple count of the number of conforming and nonconforming responses.

A D-score, or difference score, was figured by subtracting the number of nonconforming responses from the number of conforming responses. The possible range of D-scores was from +20 (complete conformity) to -20 (conplete nonconformity).

APPENDIX C

CREATIVITY CHARACTERISTICS CHECKLIST AND STUDY GLOSSARY

Observation Record (Creative Activities)*

Teacher_____ No._____ Date_____

Child_____ Age_____ School_____

1. Adventurous	1 2 3 4 5 6 N	Inhibited
2. Affectionate	1 2 3 4 5 6 N	Self-centered
3. Curious	1 2 3 4 5 6 N	Indifferent
4. Persistent	1 2 3 4 5 6 N	Inattentive
5. Competitive	1 2 3 4 5 6 N	Passive
6. Self-starter	1 2 3 4 5 6 N	Dependent
7. Problem-solver	1 2 3 4 5 6 N	Insensitive to problems
8. Flexible	1 2 3 4 5 6 N	Rigid
9. Positive self-image	1 2 3 4 5 6 N	Negative self-image
10. Aesthetic awareness	1 2 3 4 5 6 N	Aesthetic insensitivity
11. Open	1 2 3 4 5 6 N	Defensive
12. Psychologically free	1 2 3 4 5 6 N	Non-adaptive
13. Playful, humorous	1 2 3 4 5 6 N	Overly-serious
14. Tries the difficult	1 2 3 4 5 6 N	Chooses easy way out

* 1 is very high, 6 is very low, N is not observable.

CREATIVITY CHARACTERISTICS STUDY
GLOSSARY

(To be used with observation records)

Child Behaviors

1. ADVENTUROUS--INHIBITED

Adventurous	Inhibited
a. tests limits of set standards	a. uncertain
b. courageous in stating convictions	b. lacks sense of conviction
c. disturbs procedures and groups with new ideas	c. conforms readily to standards of others
d. gullible in some situations	d. lacks initiative, passive
e. precocious	

2. AFFECTIONATE--SELF-CENTERED

Affectionate	Self-centered
a. loving in physical contacts	a. lacks feelings of warmth toward others
b. altrusistic	b. uncontrolled in expressing feelings
c. emotionally sensitive, reacts with sympathy	c. rude to others
d. bashful at times, appears shy or timid at first	d. demands unwarranted attention
f. feels emotions strongly	e. appears not to want physical contact
	f. bold, rough in approach to others
	g. lacks sympathy, self-pitying

3. CURIOUS--INDIFFERENT

Curious	Indifferent
a. questions why	a. overly-conforming to other's opinions
b. looks for causality	b. lacks general interest
c. searches for solutions	c. bored, whiney, wonders what to do next
d. unwillingness to accept super-explanations	d. often says, "I don't want..."
e. explores possibilities	e. lacks excitement in new surroundings

4. PERSISTENT--INATTENTIVE

Persistent	Inattentive
a. pre-occupied at task	a. gives up easily
b. determined, unflinching	b. listless, cannot carry on alone
c. industrious, busy with own interest	c. attention span overly short
d. likes to work alone at times	d. needs people around but disturbs them by interruptions
e. shows autonomy in choosing activities	e. inability to concentrate
f. absorbed, not talkative when occupied	

5. COMPETITIVE--PASSIVE

Competitive	Passive
a. easily motivated	a. resists the calculated risk
b. excited about games	b. afraid of losing
c. critical when others follow rules too rigidly	c. uncertain if doesn't win
d. desirous of excelling	d. prefers to play alone rather than compete
e. energetic at games	

6. SELF-STARTER--DEPENDENT

Self-starter	Dependent
a. spirited in disagreement	a. refuses to take a positive stand
b. tends to be stubborn, persists in own ideas (will listen, is flexible)	b. gives in when ideas are challenged
c. aggressive in giving ideas	c. shy in giving ideas(if any are given)
d. initiates own activities	d. non-aggressive or assertive in answering
e. highly motivated, organizes others	e. a follower
f. assertive	f. lacks confidence
g. confident in appearance and answers	

7. PROBLEM-SOLVER--INSENSITIVE TO PROBLEMS

Problem-solver	Insensitive to problems
a. guesses, hypothesizes	a. lacks sense of ambiguity

b. many ideas given, verbal fluency
c. intuitive
d. can hold ideas in abeyance while seeking deeper
e. produces multipe possibilities
f. experiments
g. looks for information in more depth

b. lack of ideas
c. flits from one thing to another without ever getting involved
d. not able to concentrate long enough to discover problem
e. lack of verbal fluency

8. FLEXIBLE--RIGID

Flexible

a. builds upon what he knows
b. can look at things in different ways
c. questions the accepted solution
d. original ideas
e. can elaborate

Rigid

a. answers follow one trend of thinking
b. all answers converge from given facts
c. seeks one right answer
d. ability to give appropriate response within culture
e. can only see on possibility
f. no sense of imagery, elaboration

9. POSITIVE SELF-IMAGE--NEGATIVE SELF-IMAGE

Positive self-image

a. self-satisfied, self-reliant
b. healthy, high energy level
c. reserved
d. loves solitude but outgoing in groups
e. self-confident in approach to life

Negative self-image

a. restrained, unsure
b. psychologically unhealthy
c. dependent in judgment
d. lacks confidence in own thinking
e. hesitant in speech
f. checks always to make sure he is right
g. waits for others to take initiatve

10. AESTHETIC AWARENESS--AESTHEIC INSENSITIVITY

Aesthetic awareness

a. sense of beauty
b. sense of wonder at universe
c. stops to look closely
d. sensory keenness
e. fantasy in play

Aesthetic insensitivity

a. unaware, uninterested in surroundings
b. lacks enthusiasm
c. fearful of expressing self in drawings
d. does not take time to look

11. OPEN--DEFENSIVE

Sincere, open	Defensive
a. truthful even when it hurts	a. overly rationalizing
b. ability to evaluate self	b. closed, refuses to listen
c. openness to others	c. afraid, timid when questined
d. internal locus of evaluation	d. rigid viewpoint, lacks sense of right from wrong
e. adaptive flexibility	

12. PSYCHOLOGICALLY FREE-NON-ADAPTIVE

Psychologically free	Non-adaptive
a. can make a choice on his own	a. over conformity to others times
b. free to conform or not to conform, not rigid in either	b. complete noncomformity, no psychological freedom
c. adaptive freedom	

13. PLAYFUL, HUMOROUS--OVERLY-SERIOUS

Playful, humorous	Overly-serious
a. fanciful explanations	a. too serious in approach to life
b. fantastic stories, great imagination	b. no enjoyment in social play
c. new uses for stories, new endings	c. rigid view as to how play could be performed
d. openness to new play situations	d. unanimated
e. variation in use of play equipment	e. no ideas as to new story endings
	f. rigid rules in playing toys

14. TRIES THE DIFFICULT--CHOOSES EASY WAY OUT

Tries the difficult	Chooses easy way out
a. preference for complex tasks	a. tries only things he is certain he can do
b. remembers details quite well, sees inherent relationships	b. lack of memory for inherent relations
c. willing to take the calculated risk	c. waits for prompting and urging before trying difcult tasks
d. persistent	d. gives up easily
	f. easily discouraged

APPENDIX D

COURSE SYLLABUS

Instructor's name Sister Margaret Mary Keily

I. Title of the Course:

Early Childhood Education Curriculum I
"A Theoretical Model for Learning"

Ed. 325

II. Description and Course Hours:

Four semester undergraduate hours
Three semester graduate hours

"The course deals with a theoretical model of how learning takes place. It deals with a three-level model of learning in which level one would be the formulation of associations which is essential to level 2 learning, conceptualization of the relationship between and within associations. Level 3 learning, creative-self direction is seen as a fusion of cognitive and emotional production. When students have this background they will work in a preschool and gather data on the levels of learning through use of the KELP kit. They will also observe creativity of the children after they had studied it in detail in class . Two instruments, the Starkweather test of freedom to conform or not to conform and a creative activities check list will be explained and used in the field work."

III. Placement:

Fall semester

Pre-requisites: It would be useful to have a background in psychology courses.

IV. Objectives:

Central: To have a deeper understanding of how children learn.

Contributory:

To observe children in their work with certain items from the Kelp kit and to record their levels of learning.

To test children by use of the Starkweather test of creativity in the aspect of their conforming and non-conforming behavior by use of the Starkweather test and to record the results.

To observe children and their creative activities through a checklist drawn up through research and discussion of it in preschool children.

V. Teaching Methods:

Lectures, class discussion, films, tapes, observation forms, and guided field work in the preschools.

VI. Teaching Aids:

Study questions and some further readings for each unit of study.

Tapes and films dealing with early childhood education.

Overhead projector and transparencies.

Kelp kit and Starkweather tests.

VII. Means of Evaluation:

Midterm research paper on several comprehensive questions dealing with the way children learn.

Final project report of data gathered on the children through the use of three instruments.

Oral report to instructor during test week.

VIII. Units of the Course:

I. The private world of the individual

II. The nature of learning

III. The neurological foundations of learning

IV. Creativity and the preschool child.

IX. Bibliography:

A list of further readings will be given with each list of questions for the study of the unit.

The students will spend one class period in the library researching books and periodicals available and will make a list of these from which a composite list will be drawn up.

X. Texts used:

Wilson, John, Robeck, M.C. and Michael W. Psychological Foundations of Learning and Teaching. New York: McGraw Hill, Inc., 1968.

Torrance, E. P. Creativity: Early Dimensions of Learning and Teaching. Palo Alto, California: Fearon Press Inc., 1971.

APPENDIX E

LIST OF STUDENTS IN CLASS WHO DISCUSSED
THE CREATIVE ACTIVITIES CHECKLIST
AS TO THE OBSERVABILITY OF
TRAITS IN PRESCHOOLERS

Student No. and Sex	Background in the area of ECE (Early Childhood Education)	Rank in college
	BECEP* Staff Members	
F 001	B. S. in elementary education; candidate for masters in ECE; teacher in private kindergareten for 18 years; now Director of BECEP; mother of three children	Graduate student
F 002	B.S. degree in Nursing with speciality in Child Care; traineeship at John F. Kennedy Child Development Center in Denver; clinical supervisor and instructor in Pediatric nursing for 25 years, Director of Health Education at BECEP.	Graduate student
F 003	B.S. and Masters in Social Work; director of social work for county for 10 years; mother of four children; Director of Special Services and Assistant Director of BECEP.	Graduate student
F 004	B. S. degree in social work; worked for three years with psychologists at state university on cognitive development of preschoolers based on Piaget's findings. Oldest of a family of 13 children	Graduate student
F 005	B.S. degree in elementary education; mother of two children; taught five years in elementary and two years in preschool; Head Teacher in Headstart.	Graduate student
F 006	B.S. in elementary education; mother of four children, one of whom is retarded; teacher in special needs program,	Graduate student

* Bismarck Early Childhood Education Programs

F 007	B.A. in French and secondary education; taught private French lessons in elementary school; oldest of five children; teacher aide in Headstart.	Graduate student
F 008	B. S. in elementary education; taught three years in first grade; mother of an 11 month-old boy.	Graduate student
F 009	Junior in elementary education; mother of three preschool children	Undergraduate junior
F 010	Teacher-aide in Headstart; mother of five children; three years in Headstart.	Undergraduate sophomore
F 011	B.S. in elementary education this spring; mother of two teen-age children; eight years as teacher in elementary and five years in preschool; teacher in Headstart with three-and-four-year-olds.	Undergraduate senior
F 011	Working for second year with the special needs program as an aide; second in a family of two children	Freshman undergraduate
F 012	Working for the second year with BECEP; worked for two years as high school helper with mentally retarded children in School of Hope, Bismarck, N. Dak.	Undergraduate freshman
F 013	Teacher aide in Headstart with four-year-olds; mother of four children; three years in preschool and one year as secretary in elmentary school.	Undergraduate sophomore
M 014	Teacher aide in Day Care; second year with Day Care; oldest of seven children.	Undergraduate sophomore
M 015	Teacher in Headstart with the four-year-olds; father of a three-year-old girl; two years as teacher in Day Care and one year with Headstart; will receive a B.S. degree in elementary education in the spring of 1974.	Undergraduate senior
F 016	Teacher aide in Headstart for the second year; carrying on a full college program.	Undergraduate junior

F 017	Teacher aide in Headstart with the five and six-year-olds; mother of four children; with BECEP for the fourth year.	Undergraduate junior
F 018	Teacher aide at Day Care; first year with a preschool program.	Freshman undergraduate
F 019	A senior in Biology, picking up credits for her elementary education certificate; mother of two preschool children.	Undergraduate senior
F 020	A teacher in special education in the Bismarck Public Schools; working on a degree in elementary education; mother of three children; taught in the elementary school for fifteen years; will graduate with a B.S. degree in spring, 1974.	Undergraduate senior
F 021	Working on a degree in elementary education; worked as life-guard for several summers.	Undergraduate junior
F 022	Full-time student at Mary College; second youngest in a family of ten; worked for one summer at Day Care.	Undergraduate junior
F 023	Full-time student at Mary College; attended schools on the Indian reservation; one of five children; spent one interim as teacher's aide in grade one.	Undergraduate junior
F 024	Full-time college student; only child; one interim as teacher's aide in grade two.	Undergraduate junior
F 025	Full-time college student; worked two summers with Headstart; one interim as teacher's aide in grade two.	Undergraduate junior
F 026	Full-time college student; only child; one interim in elementary school doing pre-teaching.	Undergraduate junior
F 027	Full-time college student; worked several summers with children's theater.	Undergraduate sophomore
F 028	Full-time college; transfer student with background in ECE; mother of a one-and-a-half-year-old boy.	Undergraduate junior

F 029	Full-time college student; oldest of six children; did pre-teaching experience during interim in grade two.	Undergraduate junior
F 030	Full-time college student; will receive a B.A. in elementary education in spring of 1974; taught for five years in elementary school; did student teaching in grade three.	Undergraduate senior
F 031	Full-time college student; oldest in family of five; worked in California during one interim in preschool and one interim in grade one.	Undergraduate junior
F 032	Full-time college student; oldest in family of five; did pre-teaching in grade four for one interim and taught French to fifth graders during one interim.	Undergraduate junior

APPENDIX F

DESCRIPTIVE DATA AND TEST SCORES OF PRESCHOOL CHILDREN WHO PARTICIPATED IN THE STUDY THROUGH THE USE OF THREE INSTRUMENTS TO IDENTIFY CREATIVE BEHAVIOR

Sex and code number	Age	KELP	Starkweather	Average of Creative Activities	C.A. T_1	C.A. T_2
F 001	5-9	3	4	2.8	2.8	2.8
F 002	5-9	1	1	3.5	3.6	3.3
M 003	5-8	1	1	2.9	3.0	2.8
M 004	5-7	5	5	2.3	2.0	2.5
F 005	5-7	4	4	4.0	4.3	3.6
M 006	6-2	0	0	1.9	1.8	1.2
F 007	5-6	2	1	2.1	2.0	2.2
M 008	5-7	0	0	3.7	3.6	3.8
F 009	5-1	0	0	4.3	4.6	4.0
M 010	4-9	2	4	3.5	3.4	3.6
M 011	4-9	0	0	3.6	3.6	3.6
M 012	6-1	5	5	2.7	3.5	3.9
M 013	6-2	3	5	2.2	2.6	1.9
F 014	6-1	3	5	2.3	2.2	2.4
M 015	6-0	1	0	3.4	4.3	2.4
M 016	6-0	2	5	2.9	3.0	2.9
F 017	6-0	1	5	3.6	3.9	3.4
M 018	6-1	5	5	1.5	1.5	1.5
M 019	5-7	1	0	3.0	3.1	2.9
M 020	6-1	4	5	1.5	1.2	1.8
M 021	5-10	5	5	2.1	2.2	2.1
M 022	6-2	0	0	2.8	3.3	2.2
F 023	6-1	0	0	4.0	4.5	3.6
M 024	6-0	0	3	2.9	2.4	3.4
M 025	5-11	3	1	1.8	1.8	1.9
F 026	6-3	3	5	1.4	1.1	1.7
F 027	5-11	1	0	3.7	3.6	3.9
F 028	6-3	2	0	2.2	2.2	2.2
M 029	5-11	0	1	3.5	3.0	4.1
M 030	6-10	0	0	3.1	1.8	4.5
M 031	6-2	1	0	4.4	4.2	4.5
F 032	5-10	5	4	2.2	2.2	2.3
F 033	6-3	1	0	3.6	4.1	3.0
M 034	5-6	2	3	3.4	3.2	3.6
M 035	5-7	4	4	2.2	2.0	2.4
M 036	5-4	1	0	3.6	3.5	3.7

Sex and code number	Age	KELP	Starkweather	Mean of Creative Activities	C.A. T_1	C.A. T_2
F 037	6-0	4	4	3.0	4.1	1.6
M 038	6-0	5	5	2.5	2.6	2.3
F 039	6-0	5	5	1.3	1.2	1.5
F 040	5-11	2	0	3.0	3.4	2.6
M 041	5-4	2	5	4.8	5.0	4.7
F 042	5-5	4	1	2.6	2.8	2.5
F 043	5-5	3	0	3.3	3.5	3.0
M 044	4-7	5	5	1.4	1.4	1.4
M 045	5-9	1	5	1.4	1.2	1.4
M 046	4-6	0	0	2.4	2.4	2.4
F 047	5-8	0	0	1.4	1.2	1.4
F 048	4-1	3	5	2.8	2.6	3.0
F 049	4-6	0	0	2.7	2.4	3.0
M 050	3-7	0	0	1.4	1.1	1.6
M 051	5-0	3	3	3.6	3.6	3.6
F 052	5-0	2	2	3.6	3.6	3.6
F 053	6-2	0	0	'	2.2	1.2
F 054	3-3	0	0	3.6	3.6	3.5
M 055	5-8	2	3	3.2	2.8	3.5
M 056	4-2	0	5	2.1	1.4	2.7
F 057	5-11	1	0	1.2	1.2	1.2
M 058	4-1	0	0	4.2	4.0	4.3
F 059	6-2	4	5	2.8	2.4	3.1
F 060	3-6	0	0	3.4	2.1	4.6
F 061	5-8	5	5	1.7	1.3	2.0
F 062	5-3	5	5	1.8	1.5	2.1
M 063	3-8	0	4	2.0	2.0	2.0
F 064	6-2	3	2	2.1	2.1	2.1
F 065	4-10	5	5	1.8	1.6	2.0
M 066	3-11	0	0	2.5	2.0	3.0
F 067	3-6	0	0	2.4	2.3	2.4
F 068	3-6	0	0	1.4	1.2	1.5
M 069	4-9	0	0	3.8	3.7	4.0
M 070	3-2	0	1	3.0	3.1	2.8
F 071	3-11	0	5	2.4	2.5	2.3
M 072	5-5	0	0	2.4	3.1	1.6
M 073	3-11	0	2	2.3	2.3	2.3
M 074	5-9	2	5	2.1	1.7	2.5
F 075	5-7	2	4	2.4	3.1	3.7
M 076	5-7	2	4	3.1	3.1	3.1
M 077	4-7	4	4	2.4	1.5	3.2
F 078	3-3	2	5	1.7	1.9	1.5
M 079	4-6	4	4	2.4	2.4	2.4
F 080	4-5	0	3	4.2	4.8	3.6
M 081	5-7	4	5	2.8	1.6	2.0
F 082	6-1	0	0	4.9	4.5	5.2

Sex and code number	Age	KELP	Starkweather	Ave. of Creative Activities	C. T_1	A. T_2
M 083	6-2	0	0	3.1	3.0	3.2
M 084	6-2	0	0	3.9	4.2	3.5
M 085	6-4	0	4	4.4	4.4	4.4
F 086	6-4	0	0	3.4	3.5	3.2
M 087	6-7	3	0	3.5	3.4	3.4
M 088	6-7	4	4	2.1	2.1	2.0
F 089	5-10	1	1	3.0	2.7	3.2
M 090	6-1	2	5	1.6	1.1	2.1
F 091	6-0	4	2	2.4	2.3	2.5
F 092	6-0	1	1	2.8	3.1	2.5
F 093	6-6	0	0	4.7	4.8	4.7
F 094	6-5	4	4	2.0	1.7	2.2
F 095	5-2	0	3	4.1	4.1	4.0
M 096	6-1	0	5	3.7	3.8	3.7
M 097	5-3	0	1	2.3	2.5	2.0
F 098	4-6	0	0	4.5	4.4	4.6
M 099	4-11	0	0	4.7	4.3	5.0
F 100	4-8	0	1	3.3	2.9	2.7
F 101	5-3	0	0	3.1	3.1	3.1
M 102	6-6	0	0	3.6	4.0	3.1
M 103	4-11	0	0	3.1	3.4	2.8
M 104	4-11	0	0	2.8	3.0	2.6
M 105	4-0	1	5	1.7	2.0	1.3
F 106	4-9	0	4	2.0	2.4	2.4
M 107	4-8	0	5	2.7	3.0	2.4
F 108	4-9	0	0	2.8	3.0	2.6
F 109	4-9	0	0	4.0	4.2	3.7
F 110	4-7	0	0	2.9	3.4	2.3
M 111	4-10	1	2	3.2	3.2	3.2
F 112	4-5	0	3	5.0	5.0	5.0
F 113	4-1	0	0	3.7	4.0	3.4
F 114	4-5	0	2	3.9	4.2	3.6
F 115	4-8	0	4	1.7	1.6	1.8
M 116	4-4	0	5	2.6	2.2	2.9
F 117	3-4	0	0	1.7	1.9	1.6
M 118	3-7	0	0	2.2	1.9	2.4
F 119	4-6	0	2	4.2	4.0	4.3
F 120	4-4	1	5	2.9	2.8	3.0
M 121	4-5	0	0	2.6	2.0	3.1
M 122	4-3	0	4	1.6	1.3	1.3
F 123	3-2	0	3	2.8	2.0	3.5
F 124	4-4	0	2	4.3	4.4	4.2
F 125	4-8	0	0	3.2	3.3	3.0
M 126	4-5	4	4	1.5	1.4	1.5
F 127	4-2	0	4	1.8	2.0	1.6

Sex and code number	Age	Kelp	Starkweather	Ave. of Creative Activities	C. A. T_1	C. A. T_2
F 128	4-5	1	0	3.5	3.7	3.2
F 129	5-0	1	3	2.5	2.3	2.7
M 130	5-3	0	0	2.9	3.7	2.2
M 131	5-4	0	0	5.0	4.9	5.0
F 132	5-3	0	0	3.2	3.6	2.7
F 133	5-7	2	3	2.4	2.7	2.1
M 134	6-10	2	3	2.1	1.8	2.3
F 135	5-9	3	5	1.8	1.9	1.6
M 136	5-7	0	3	3.5	4.2	2.7
F 137	5-6	2	0	1.6	1.6	1.6
M 138	5-9	0	3	4.2	4.2	4.2
M 139	5-10	1	1	4.0	4.8	3.2
M 140	5-4	0	4	3.5	3.5	3.4
M 141	5-8	3	3	2.5	2.5	2.4
M 142	5-9	0	5	4.5	4.5	4.4
F 143	5-7	2	4	3.1	2.1	4.1
M 144	5-7	0	0	2.9	2.9	2.9
M 145	5-5	2	1	4.3	4.1	4.3
F 146	5-8	2	0	4.9	5.3	4.4
M 147	5-5	0	4	3.1	3.0	3.1
M 148	5-9	0	5	3.4	3.1	3.6
M 149	6-0	4	4	2.2	1.2	3.1
F 150	5-1	3	5	3.0	2.0	4.0
M 151	5-0	1	0	3.2	3.1	3.3
F 152	5-9	5	1	3.8	4.1	3.4
M 153	5-5	1	0	2.9	1.8	4.0
M 154	5-4	1	0	3.4	3.0	3.7
M 155	4-6	0	0	4.7	6.0	3.3

APPENDIX G

DESCRIPTIVE DATA AND AVERAGE SCORES ON CREATIVE ACTIVITIES CHECKLIST FOR TWO OBSERVATIONS (FEBRUARY AND APRIL) OF PRESCHOOL CHILDREN WHO PARTICIPATED IN THE STUDY
(N = 155)

Sex and code no.	Age	Teacher # 1		Teacher # 2		Average	
		O_1	O_2	O_1	O_2	O_1	O_2
Site # 3							
F 001	5:9	2.8	3.2	2.8	2.8	2.8	3.0
F 002	5:9	3.6	3.8	3.3	2.8	3.5	3.3
M 003	5:8	3.0	3.5	2.8	2.1	2.9	2.8
M 004	5:7	2.0	2.2	2.5	2.0	2.3	2.1
F 005	5:7	4.3	4.2	3.6	3.5	4.0	3.9
M 006	6:2	1.8	2.2	1.2	1.8	1.9	2.0
F 007	5:6	2.0	2.0	2.2	2.4	2.1	2.2
M 008	5:7	3.6	4.0	3.8	3.8	3.7	3.9
F 009	5:1	4.6	4.1	4.0	5.5	4.3	4.8
M 010	4:9	3.4	3.6	3.6	4.3	3.5	4.0
M 011	4.9	3.6	4.2	3.6	3.6	3.6	3.9
M 012	6:1	3.5	4.1	3.9	2.6	2.7	3.4
Site # 1							
M 013	6:2	2.6	3.5	1.9	2.0	2.2	2.8
F 014	6:1	2.2	3.3	2.4	1.9	2.3	2.6
M 015	6:0	4.3	3.9	2.4	1.9	3.4	2.9
M 016	6:0	3.0	2.7	2.9	2.6	2.9	2.7
F 017	6:0	3.9	4.0	3.4	3.6	3.6	4.0
M 018	6:1	1.5	2.5	1.5	1.5	1.5	2.0
M 019	5:7	3.1	3.3	2.9	2.9	3.0	3.1
M 020	6:1	1.2	1.5	1.8	1.1	1.5	1.3
M 021	5:10	2.2	2.4	2.1	1.3	2.1	1.9
M 022	6:2	3.3	4.6	2.2	1.8	2.8	3.2
F 023	6:1	4.5	3.9	3.6	3.7	4.0	3.8
M 024	6:0	2.4	2.8	3.4	3.9	2.9	3.4
M 025	5:11	1.8	3.7	1.9	2.3	1.8	3.0
F 026	6:3	1.1	2.2	1.7	1.4	1.4	1.8
F 027	5:11	3.6	4.1	3.9	4.1	3.7	4.1
F 028	6:3	2.2	3.0	2.2	2.5	2.2	2.8
M 029	5:11	3.0	3.3	4.1	3.4	3.5	3.4
M 030	6:10	1.8	2.8	4.5	4.0	3.1	3.4
M 031	6:2	4.2	4.4	4.5	4.3	4.4	4.6
F 032	5:10	2.2	3.0	2.3	2.5	2.2	2.8
F 033	6:3	4.1	3.9	3.0	2.4	3.6	3.2

Sex and code no.	Age	Teacher # 1 O_1	Teacher # 1 O_2	Teacher # 2 O_1	Teacher # 2 O_2	Average O_1	Average O_2
M 034	5:6	3.2	3.3	3.6	2.6	3.4	3.0
M 035	5:7	2.0	2.0	2.4	1.8	2.2	1.9
M 036	5:4	3.5	3.3	3.7	4.0	3.6	3.7
F 037	6:0	4.1	3.1	1.6	2.6	3.0	2.9
M 038	6:0	2.6	2.7	2.3	2.3	2.5	2.5
F 039	6:0	1.2	1.7	1.5	1.2	1.3	1.5
F 040	5:11	3.4	2.9	2.6	2.6	3.0	2.8
M 041	5:4	5.0	4.9	4.7	4.5	4.8	4.7
F 042	5.5	2.8	3.8	2.5	2.5	2.6	2.7
M 043	5:5	3.5	3.8	3.0	2.5	3.3	3.2
Site # 4							
M 044	4:7	1.4	1.4	1.4	1.6	1.4	1.5
M 045	5:9	1.2	1.2	1.4	1.4	1.4	1.3
M 046	4:6	2.4	2.8	2.4	2.7	2.4	2.8
F 047	5:8	1.2	1.2	1.5	1.2	1.4	1.2
F 048	4:1	2.6	2.1	3.0	1.6	2.8	1.9
F 049	4:6	2.4	3.1	3.0	3.1	2.7	3.1
M 050	3:7	1.1	1.2	1.6	1.4	1.4	1.3
M 051	5:0	3.6	2.4	3.6	2.1	3.6	2.3
F 052	5:0	3.6	1.9	3.6	1.9	3.6	1.9
F 053	6:2	2.2	1.6	1.2	1.2	1.7	1.4
F 054	3:3	3.6	3.7	3.5	3.4	3.6	3.6
M 055	5:8	2.8	2.4	3.5	1.8	3.2	2.1
M 056	4:2	1.4	1.2	2.7	1.7	2.1	1.5
F 057	5:11	1.2	1.2	1.2	1.3	1.2	1.3
M 058	4:1	4.0	4.0	4.3	3.9	4.2	4.0
F 059	6:2	2.4	2.4	3.1	2.3	2.8	2.4
F 060	3:6	2.1	2.1	4.6	2.0	3.4	2.1
F 061	5:8	1.3	1.8	2.0	2.0	1.7	1.9
F 062	5:3	1.5	1.8	2.1	1.6	1.8	1.7
M 063	3:8	2.0	1.5	2.0	1.9	2.2	1.7
F 064	6:2	2.1	1.4	2.1	1.7	2.1	1.6
F 065	4:10	1.6	1.1	2.0	1.7	1.8	1.4
M 066	3:11	2.0	1.3	3.0	1.9	2.5	1.6
F 067	3.6	2.3	2.1	2.4	2.8	2.4	2.5
F 068	3:6	1.2	1.1	1.5	1.2	1.4	1.2
M 069	4:9	3.7	3.7	4.0	4.0	3.8	3.4
M 070	3:2	3.1	2.3	2.8	3.0	3.0	2.2
F 071	3:11	2.5	1.3	2.3	1.6	2.4	1.5
M 072	5:5	3.1	3.1	1.6	1.6	2.4	2.4
M 073	3:11	2.3	1.8	2.3	2.0	2.3	1.9
M 074	5:9	1.7	1.5	2.5	1.8	2.1	1.7

Sex and code no.	Age	Teacher #1 O_1	Teacher #1 O_2	Teacher #2 O_1	Teacher #2 O_2	Average O_1	Average O_2
F 075	5:7	3.1	3.0	3.7	3.4	2.4	3.2
M 076	5:7	3.1	2.7	3.1	1.6	3.1	2.2
M 077	4:7	1.5	1.4	3.2	1.6	2.4	1.5
F 078	3:3	1.9	1.1	1.5	1.2	1.7	1.2
M 079	4:6	2.4	1.6	2.4	1.7	2.4	1.7
F 080	4:5	4.8	3.4	3.6	2.9	4.2	3.2
Site # 2							
M 081	5:7	1.6	2.1	2.0	2.1	1.8	2.1
F 082	6:1	4.5	3.8	5.2	3.6	4.9	3.9
M 083	6:2	3.0	4.8	3.2	4.9	3.1	4.9
M 084	6:2	4.2	1.6	3.5	1.8	3.9	1.7
M 085	6:4	4.4	4.7	4.4	4.7	4.4	4.7
F 086	6:4	3.5	3.6	3.2	3.6	3.4	3.6
M 087	6:7	3.4	3.4	3.4	3.4	3.5	3.4
M 088	6:7	2.1	1.9	2.0	2.1	2.1	2.0
F 089	5:10	2.7	3.4	3.2	2.5	3.0	3.0
M 090	6:1	1.1	2.0	2.1	2.1	1.6	2.1
F 091	6:0	2.3	2.4	2.5	2.4	2.4	2.4
F 092	6:0	2.3	2.4	2.5	2.4	2.4	2.4
F 093	6:6	3.1	4.4	2.5	3.8	2.8	4.1
F 094	6:5	4.8	5.1	4.7	5.1	4.7	5.1
F 095	5:2	1.7	2.0	2.4	2.4	2.0	2.2
M 096	6:1	4.1	4.1	4.0	4.0	4.1	4.1
M 097	5:3	3.8	2.4	3.7	2.1	3.7	2.3
F 098	4:6	2.5	2.6	2.0	2.0	2.3	2.3
M 099	4:11	4.3	4.1	5.0	4.0	4.7	4.1
F 100	4:8	2.9	3.1	2.7	2.4	3.3	2.9
F 101	5:3	3.1	3.0	3.1	2.8	3.1	2.6
M 102	6:6	4.0	3.8	3.1	3.8	3.6	3.8
M 103	4:11	3.4	3.8	2.8	2.8	3.1	3.3
M 104	4:11	3.0	3.4	2.6	2.0	2.8	2.7
M 105	4:0	2.0	2.4	1.3	1.0	1.7	1.7
F 106	4:9	2.4	2.8	2.4	2.0	2.0	2.4
M 107	4:8	3.0	3.4	2.4	2.1	2.7	3.6
F 108	4:9	3.0	3.1	2.6	2.0	2.8	2.6
F 109	4:9	4.2	4.2	3.7	3.0	4.0	3.6
F 110	4:7	3.4	3.6	2.3	2.5	2.9	3.1
M 111	4:10	3.2	3.5	3.2	2.1	3.2	2.8
F 112	4:5	5.0	5.0	5.0	5.0	5.0	5.0
F 113	4:1	4.0	4.0	3.4	4.1	3.7	4.1
F 114	4:5	4.2	4.3	3.6	3.6	3.9	4.0
F 115	4:8	1.6	1.4	1.8	2.4	1.7	1.9
M 116	4:4	2.2	2.2	2.9	3.5	2.6	3.8

Sex and code no.	Age	Teacher 1 O_1	Teacher 1 O_2	Teacher 2 O_1	Teacher 2 O_2	Average O_1	Average O_2
F 117	3:4	1.9	1.5	1.6	2.5	1.7	1.8
M 118	3:7	1.9	1.9	2.4	2.3	2.2	2.1
F 119	4:6	4.0	3.8	4.3	4.9	4.2	4.2
F 120	4:4	2.8	2.8	3.0	3.3	2.9	2.9
M 121	4:5	2.0	1.5	3.1	3.4	2.6	2.5
M 122	4:3	1.9	1.3	1.3	3.4	1.6	2.4
F 123	3:2	2.0	2.1	3.5	2.2	2.8	2.2
F 124	4:4	4.4	2.4	4.2	3.1	4.3	2.8
F 125	4:8	3.3	1.7	3.0	2.6	3.2	2.2
M 126	4:5	1.4	1.1	1.5	1.7	1.5	1.4
F 127	4:2	2.0	1.9	1.6	2.2	1.8	2.1
F 128	4:5	3.7	1.8	3.2	3.4	3.5	2.6
F 129	5:0	2.3	2.3	2.7	2.2	2.5	2.3
M 130	5:3	3.7	2.6	2.2	2.1	2.9	2.4
M 131	5:4	4.9	4.1	5.0	4.3	5.0	4.3
F 132	5:3	3.6	3.5	2.7	2.5	3.5	3.0
F 133	5:7	3.7	3.2	2.1	2.0	2.4	2.6
M 134	6:10	1.8	1.9	2.3	2.0	2.1	2.0
F 135	5:9	1.9	1.6	1.6	1.3	1.8	1.5
M 136	5:7	4.2	3.4	2.7	3.1	3.5	3.3
F 137	5:6	1.6	1.4	1.6	1.4	1.6	1.4
M 138	5:9	4.2	4.0	4.2	2.3	4.2	3.2
M 139	5:10	4.8	4.1	3.2	2.7	4.0	3.4
M 140	5:4	3.5	4.5	3.4	2.8	3.5	3.7
M 141	5:8	2.5	2.8	2.4	1.8	2.5	2.3
M 142	5:9	4.5	4.6	4.4	3.8	4.5	4.2
F 143	5:7	2.1	1.9	4.1	3.6	3.1	2.8
M 144	5:7	2.9	3.0	2.9	3.1	2.9	3.1
M 145	5:5	4.1	4.0	4.3	3.7	4.3	3.9
F 146	5:8	5.3	5.4	4.4	4.8	4.9	5.1
M 147	5:5	3.0	4.2	3.1	3.4	3.1	3.8
M 148	5:9	3.1	4.6	3.6	4.3	3.4	4.5
M 149	6:0	1.2	2.2	3.1	3.2	2.2	2.7
F 150	5:1	2.0	2.5	4.0	3.7	3.0	3.1
M 151	5:0	3.1	3.4	3.3	3.1	3.2	3.2
F 152	5:9	4.1	3.6	3.4	3.0	3.8	3.3
M 153	5:5	1.8	2.1	4.0	3.4	2.9	2.8
M 154	5:4	3.0	3.7	3.7	3.9	3.4	3.8
M 155	4:6	6.0	5.7	3.3	3.5	4.7	4.6

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