CREATIVITY IN EARLY CHILDHOOD: A PROFILE STUDY OF CHARACTERISTICS RELATED TO CREATIVITY

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this study was to examine the relationships among characteristics of creativity which can be measured in early childhood. The battery of tests selected for use were developed as a part of the creativity research program at Oklahoma State University. These include: (1) a test of originality; (2) a form boards test designed to measure children's freedom to use conforming and nonconforming behavior; (3) a target game designed to measure children's willingness to try difficult tasks, i.e., designed to measure children's reaction to a calculated risk; (4) a test of masculinity-femininity; and (5) a test of social relations designed to measure each child's social value within his own peer group.

A better understanding of the broad relationships among the characteristics of creativity is needed; and in addition, creativity profiles of individual children, which can be obtained by the measurement of specific characteristics, are needed as a foundation for the study of creative potential. Insofar as early childhood is concerned, it is this creative potential, rather than creative production, that must be understood.

Problem

A current trend in the behavioral sciences is toward an understanding of mental health, as opposed to mental illness, and major efforts are directed toward finding ways to build up the positive capacities of the human personality, such as self-concept. Until recently attention seemed to be focused on problems related to human personality such as delinquency and emotional disturbances; however, almost a decade ago, the need for a shift in emphasis from mental illness to mental health was implied by Barron (1963) in his observation that many and heavy were the books on mental illness but few and light were the books on mental health. The change in emphasis which has occurred, arose out of a social need and is a constructive attempt to deal with some of the problems existing today--the conditions of poverty and the increasing pressures of a technological society.

Creativity

The study of creativity is one aspect of the new focus on mental health which is evident in the behavioral sciences. A tremendous surge of interest in creativity has occurred during the past two decades and can be seen in (1) the many conferences which are devoted to the subject of creativity, (2) the courses on creative problem-solving which are offered across the nation, and (3) the research which is focused on the development and understanding of creativity.

Conferences.- One indication of the growing interest in creativity has been conferences such as the Utah Creativity Research Conference Series, supported by the United States Office of Education. All of

the conferences in this series were invitational, i.e., participants were carefully selected from the country's leading researchers, psychologists, and educators whose work was directly related to the topic of the particular conference. Since these were working conferences, the number of participants was kept to a minimum. The proceedings of most of these conferences have been made available in published form. (Taylor and Barron, 1963; Taylor, 1964a; Taylor, 1964b; Taylor and Williams, 1966; and Williams, 1968).

The first three conferences in the Utah Series (1955, 1957, and 1959) were devoted to reports and discussions of the latest creativity research. The fourth conference (1961) focused on the summarizing of research findings in creativity. The fifth conference (1962) was concerned with attempts to understand the fundamental nature and characteristics of creativity. The sixth conference (1964) focused on how instructional media might help foster and encourage creativity in our primary and secondary schools in America.

Frank E. Williams, Director of the Macalester Creativity Project in Minnesota, was co-director of the sixth conference in the Utah Series. During the many hours that he spent editing the papers and tapes from that conference, he became aware of the need for a conference on child rearing practices for developing creativity.

> Recurring throughout the past conference on instructional media and creativity were hints made by all in attendance of the necessity for a future conference aimed at primarily the problem of what parents and early childhood teachers might do to enhance the creative potential of the child. For example, it was felt by Carl Rogers that daily encounters with an atmosphere of complete freedom lacking in fill-in drawing books or structured play devices might provide clues to the child's possible development of creative thinking abilities. Marie Hughes talked about parents' overprotection of children. Paul Torrance presented ideas about parents' encouragement and

> acceptance for the unusual; Kenneth Beittel mentioned the occasional need for the child during art experiences to take risks in going beyond the fringes of the known and familiar. J.P. Guilford talked about the importance of the evaluative behaviors of youngsters as self-regulating and self-correcting through the principal of feedback from parents. (Williams, 1968, pp. iii-iv).

The proposed conference on child rearing practices for developing creativity was held in 1967 at Macalester College. The purpose was a stocktaking of what was known and a discussion of what future research would be needed in child rearing practices for the optimum development of creativity.

Courses.- A second indication of the growing interest in creativity is the increasing number of courses being offered across the nation on creative problem-solving.

> Courses in creative thinking also are multiplying rapidly. Research on creativity has found application especially in such centers as the University of Buffalo, the University of Minnesota, the University of Utah, Macalester College, Wayne State University, and Drake University, where regular courses in creative problem solving are offered. Many psychology departments offer courses and seminars on creativity. Adult education centers have also been responsive to demand from adults for work on creativity, and the National Association of Public Adult Educators has recently sponsored a book titled How to Be a More Creative Adult Learner. Many business organizations are offering such courses for their employees; these include corporations such as General Electric, U.S. Steel, General Motors, Westinghouse, and Bell Telephone, all of whom are highly dependent on innovativeness in their professional personnel. The military services and the U.S. Veterans Administration have also sponsored workshops, conferences, and in-service training for creative thinking. (Barron, 1969, p. 4).

Research.- A third indication of the growing interest in creativity is the increase in research in this area since 1950. This increase in research is exemplified by the Creative Education Foundation's 1965 listing of more than 4000 references on creativity with approximately 3000 being dated later than 1950.

A number of disciplines have been interested in creativity, and a variety of approaches have been undertaken to understand it.

> The backgrounds of the contributors range through several disciplines: genetic psychology, clinical psychology, educational psychology, child development, art education, teacher education, psychiatry, anthropology, educational and psychological research. Among the contributions, some focus on highly creative adults, some on children, some on adolescents. For some, the aim is to identify the characteristics of all persons in a given group; for still others, the aim is to develop tests and procedures which can be effectively used in further research and development. Some seek to improve selection of personnel for given tasks; some to improve education or therapy; some to improve research. Some seek an orientation to nature; some to culture; some to institutional operations; some to family; some to personal experience. Some focus on the person; some on the process; some on the product; some on the environment. (Mooney and Razik, 1967, p. ix).

One research program, that at Oklahoma State University, has focused exclusively on the creative potential of young children. For approximately ten years, the primary concern of that program has been the development of research instruments suitable for use with preschool children. At no other center has there been this type of emphasis. Recently a few studies at Oklahoma State University have been concerned with the relationships among personality characteristics which seem to be related to creativity. (e.g., McKinzie, 1968; Moffatt, 1969; Patton, 1969; Goldsmith, 1970; and Tallent, 1971). The findings of these studies have raised many questions about the influences that affect the development of creativity in early childhood.

The present research is concerned with the relationships among the characteristics of creativity which can be measured in early childhood. A better understanding of the broad relationships among these characteristics is needed; and, in addition, creativity profiles of individual children, which can be obtained by the measurement of specific

characteristics, are needed as a foundation for the study of creative potential. Insofar as early childhood is concerned, it is this creative potential, rather than creative production, that must be understood. The availability of creativity profiles may also serve as a basis for selecting children to participate in a longitudinal study of creativity.

CHAPTER II

REVIEW OF LITERATURE

The term creativity has been used both colloquially and scientifically over a period of time; and as a result, it has become a catchall label with a variety of meanings. Two meanings frequently assigned to the term have been creative potential and creative production.

> Creativity is a magic word; it catches immediate attention. . . . The term is a kind of "catchall" label, much too loosely employed. Only when we break it down into its several manageable implications are we able to do much creatively about it.
>
> We gain some degree of clarity by discriminating among several things that come under the label. We can define "creative potential" as a collection of abilities and other traits that contribute toward successful creative thinking. Creative thinking is distinguished by the fact that there is something novel about it; novel, that is, to the thinking individual. The degree of creativity shown is directly proportional to the degree of novelty.
>
> Another very common use of the term "creativity" means creative production. Production is output. In this connection we can make two further distinctions. Output may be in the form of tangible products, such as a poem, a scientific theory, a machine, or a musical composition. Some writers also insist that the tangible product be socially worthy or useful. This adds the requirement of value judgments, something that is outside the scope of basic science but is significant in the sphere of technologies that deal with human affairs. (Guilford, 1965, pp. 6-7).

Creativity in Adults

For more than a decade, the Institute of Personality Assessment and Research at the University of California has been engaged in an intensive study of creative adults. The first problem which the Institute faced was one of deciding upon a definition of creativity, and it was this definition that determined the specific course the research was to take.

> Before undertaking our studies we had to agree upon what we would consider creativity to be. This was a first requirement, since creativity has been so variously defined and described. We agreed that true creativeness fulfills at least three conditions. It involves a response that is novel or at least statistically infrequent. But novelty or originality of thought and action, while a necessary aspect of creativity, is not sufficient. If a response is to lay claim to being a part of the creative process, it must to some extent be adaptive to, or of, reality. It must serve to solve a problem, fit a situation, or accomplish some recognizable goal. And, thirdly, true creativeness involves a sustaining of the original insight, an evaluation and elaboration of it, a developing of it to the full. Creativity from this point of view, is a process extended in time and characterized by originality, adaptiveness, and realization. (MacKinnon, 1965, p. 160).

The acceptance of this definition of creativity had two important consequences for the Institute's research. Creativity was studied after it had been realized and had found expression in clearly identifiable creative products, and so-called tests of creativity were rejected as indicators of creativeness.

> The acceptance of such a conception of creativity had two important consequences for our researches. It meant that we would not seek to study creativity while it was still potential but only after it had been realized and had found expression in clearly identifiable creative products--buildings designed by architects, mathematical proofs developed by mathematicians, and the published writings of poets and novelists. Our conception of creativity forced us further to reject as indicators or criteria of creativeness the performance of individuals on so-called

> tests of creativity. While tests of this sort--that require that the subject think, for example, of unusual uses for common objects and the consequences of unusual events--may indeed measure the infrequency or originality of a subject's ideas in response to specific test items, they fail to reveal the extent to which the subject, faced with real life problems, is likely to come up with solutions that are novel and adaptive and which he will be motivated to apply in all of their ramifications. (MacKinnon, 1965, p. 160).

In assessing creative ability in adults, the Institute employed a method which involved intensively studying selected creative individuals for several days.

> Creative persons /were brought/ . . . to Berkeley, where--in the Institute building, a remodeled fraternity house--we worked with them, 10 at a time, for several days, most often over a three-day weekend. These people were studied intensively by a variety of means--by the broad problem posed by the assessment situation itself; by problem-solving experiments; by tests designed to discover what a person does not know or is unable to reveal about himself; by tests and questionnaires that permit a person to manifest various aspects of his personality and to express his attitudes, interests, and values; and by searching interviews. (MacKinnon, 1965, pp. 159-160).

Out of the intensive work with creative individuals from various professional groups, the Institute was able to identify the characteristics of the creative worker. A description of a few of the more prominent of these characteristics is presented here.

Intelligence

Creative people are intelligent, but creative giftedness is not equated with high intelligence.

> A certain amount of intelligence is required for creativity; but beyond that point, being more or less intelligent does not determine the level of a person's creativeness, and the level of intelligence required for creativity is sometimes surprisingly low. What is more important than the level of intelligence. . . is the effectiveness with which one uses whatever intelligence he has. (MacKinnon, 1965, p. 161).

Originality

Creative persons are original. This is a statement with which few people would disagree, but it must be emphasized that originality is only one part of creativeness. Unless originality is accompanied by adaptiveness and realization, as stated in the Institute's definition, it cannot be accepted as indicative of true creativeness.

Two aspects of originality can be distinguished--the quantity and the quality of an individual's responses. In general, the quantity and the quality do correlate, i.e., the person who has the greatest number of ideas is usually the person who has the better ideas. Nevertheless, this is not always true.

> These correlations are low enough, however, to suggest. . . that some persons tend to make many original responses which are not very good, while others make fewer but generally better or more fitting ones. . . Insights, however fresh and clever they may seem, do not enter the stream of creative solutions to urgent problems unless their consequences are tested in application and revised and extended to meet the requirements of the situation for which they were first devised. . . Mere fluency in unusual ideas will not alone make for fresh and creative solutions to problems, but, in some persons, rather to "freshness" in its worst sense. (MacKinnon, 1965, p. 163).

Independence

Creative persons are independent in thought and action, and are motivated toward individual goals rather than group goals.

> One can well believe that many creative students chafe under the discipline of group activities and requirements of the classroom. It is not that they are lazy, or that their level of aspiration is low, or that in their rebellious attitudes they are "rebels without a cause." The problem (if we permit it to become a problem) derives from their high level of energy which they seek to channel into independent, nongroup-coordinated strivings for extremely high goals of achievement--

> goals which they set for themselves and which may well conflict with goals that have been set for the group.
>
> It is thus a fundamental characteristic of creative subjects that they are strongly motivated to achieve in situations in which independence of thought and action is called for and that they have much less interest or motivation to achieve in situations which demand conforming behavior. (MacKinnon, 1965, p. 164).

Openness to Experience

Creative persons are expecially open to experience, both of the inner self and of the outer world. This openness comes with maturity and is not often found in the younger person, even the younger creative person.

> As between perceiving (becoming aware of something) and judging (coming to a conclusion about something), creative persons are on the side of perception--they are open to and receptive of experience and seeking to know as much as possible about life. The perceptive attitude expresses itself in curiosity and is the hallmark of an inquiring mind.
>
> The open mind can, of course, become cluttered and may--until it goes to work ordering the multiplicity of experiences which it has admitted--reveal a good deal of disorder. Moreover, having to deal with confusion and disorder in one's own mind may be sufficient cause for anxiety, expecially in the young, until at last they find some higher-order integrating and reconciling principles.
>
> . . . To grow creatively is not the easiest way to develop, and for some it may be too risky and dangerous an undertaking. Those who succeed reveal a richness and actualization of the self which the judgmental person, who in the extreme case prejudges experience and thus becomes the prejudiced person, can never achieve. More than most, creative persons are able to recognize and give expression to most aspects of inner experience and character, including the feminine in the case of the male and the masculine in the case of the female, admitting into consciousness and behavior much that others would repress, integrating reason and passion, and reconciling the rational and irrational. (MacKinnon, 1965, pp. 166-167).

Intuitiveness

Creative persons are characterized by their capacity for intuitive perceptions. They are more conscious and responsive to the deeper meanings of their perceptions than less creative persons.

> One may in any perception be imaginatively more alert and responsive to the deeper meanings, to the implications, and to the possibilities for use or action of that which is experienced by way of the senses. This immediate grasping of the real as well as the symbolic bridges between what is and what can be, I shall call intuitive perception.
>
> One would expect creative persons not to be stimulus-and object-bound, but to be alert to the as-yet-not realized. In other words, these individuals are characterized by their capacity for intuitive perception. (MacKinnon, 1965, pp. 167-168).

Strong Theoretical and Aesthetic Interests

Creative persons have strong theoretical and aesthetic interests. The Institute found on a test of values, that all of their subjects held most dear the theoretical and aesthetic values.

> On a test of values . . . which measures in the individual the relative strength of the theoretical, the economic, the aesthetic, the social, the political, and the religious values . . . all of our creative subjects hold most dear the theoretical and aesthetic values. A prizing of theoretical values is congruent with a preference for intuitive perception; for both orient the person to seek some deeper or more meaningful reality which lies beneath or beyond that which is actually present to the senses. Both set one to seek truth which resides not so much in things themselves as in the relating of them one to another in terms of identities and differences and in terms of overriding principles of structural and functional relationships.
>
> . . . Although there may appear to be some conflict between the theoretical value with its cognitive and rational concern with truth and the aesthetic value with its concern with form and beauty, these two values, as already indicated, are the two strongest values in our creative subjects. That they are both emphasized suggests that for the truly creative person the solution of a problem is not sufficient; there is the further demand that it be elegant. (MacKinnon, 1965, pp. 168-169).

Strong Sense of Destiny

Creative persons have a strong sense of destiny. They believe themselves to be destined to do what they are doing.

> With a marked degree of resoluteness and almost inevitably a measure of egotism, the creative person typically considers himself to be destined to do what he is doing, or intends to be doing, with his life. But over and above these traits there is a belief in the foregone certainty of the worth and validity of his creative efforts. This is not to say that our creative subjects have been spared periods of frustration and depression when blocked in their creative striving, but only that overriding these moods there has been a steady, unquestioning commitment of these individuals to their own creative endeavors. Another, probably related, characteristic of the creative person is that he knows who he is, where he wants to go and what he wants to achieve. . . . The creative person has solved the problem of his own identity. (MacKinnon, 1965, pp. 169-170).

Creativity in Children

The method of studying creativity in adults is not applicable to the study of creativity in children. In studying creativity in adults, one must (1) identify creative adults, possibly by their creative products, i.e., products characterized by originality, adaptiveness, and realization; (2) intensively study the subjects by a variety of means, including written tests and questionnaires; and (3) find the characteristics which these creative adults have in common.

In studying creativity in children, it is not possible to identify subjects by their creative products. Children are capable of creative production. Their products can be identified as original, i.e., they may be unique for the individual child, but their products are not characterized by the adaptiveness and realization which are essential

criteria for judging the products of adults. Adaptiveness and realization are criteria that are necessary when looking for creativity in adults, but these particular criteria are dependent on maturity. One cannot start with creative production when one is interested in studying creativity in early childhood; instead, the focus of attention must be on creative potential, which has been defined by Guilford (1965) as the collection of abilities and other traits that contribute toward creative thinking.

In studying creativity in young children, it is not advisable to use tests and questionnaires. Instead, the researcher should look for behavioral evidence of the characteristic under study. When tests and questionnaires are used, the researcher relies upon the verbal ability of the children; and under these circumstances, valid judgments of the children's responses are difficult.

A starting point in studying the creative potential of young children is observation of their behavior--observation which is designed as a search for traits and abilities that have been identified as common among creative adults. Some of these are characteristics for which there is behavioral evidence in early childhood, but others are characteristics which develop with maturity and cannot be observed in early childhood.

The remainder of this chapter is concerned with a discussion of the traits and abilities which are related to creative expression and which can be found in adults and children. The discussion is limited to those traits and abilities which can be reliably measured in early childhood.

Intelligence

Creative adults are intelligent; but beyond the fact that no mentally retarded individuals are found in any group of adults identified as creative, the Institute of Personality Assessment and Research at Berkeley did not find a significant correlation between creativity and intelligence. Intelligence is measured by tests of convergent thinking abilities; whereas, creativity is measured by tests of divergent thinking abilities. Throughout the literature there is evidence of an interest in the relationship between these two characteristics, the this relationship can and should be studied in early childhood as well as being included in the creativity research done with adults.

Intelligence is an ability which can be validly measured in young children. A number of standardized individual tests are available. These include tests of intellectual ability, such as the Stanford-Binet and the Wechsler Intelligence Scale for Children (WISC), and tests of verbal ability, such as the Peabody Picture Vocabulary Test (PPVT).

Intellectual Ability.- Azbill (1961) used the Stanford-Binet Intelligence Test in her creativity research with young children. She was interested in determining whether the preschool child's freedom of expression, which she accepted as a pervasive characteristic of creative ability, was independent of intellectual ability.

> Freedom of expression, like creative ability, is accepted as a nonintellectual variable. Support for this belief was found in a negative correlation between freedom and intelligence test scores. For the small group of children in this study, /Azbill, 1961/ those with the lower intelligence test scores (IQ's below 100) were the most free,

> and those with the higher test scores (IQ's above 140) were the least free. One possible explanation for this negative relationship is that the demands made on young children for conformity and achievement may in some way inhibit their freedom of expression, while at the same time assuring the cooperation necessary for optimum performance on an intelligence test. (Starkweather, 1971, p. 2).

Verbal Ability.- The Peabody Picture Vocabulary Test (PPVT) has been used to determine whether originality, as measured by a specific test, is a nonintellectual variable.

> The /Starkweather Originality Test/ does require verbal responses; nevertheless, the originality scores are independent of verbal ability. This was demonstrated by an analysis of originality scores and scores earned on the Peabody Picture Vocabulary Test. The correlation between these two sets of scores was not significant, and the originality test was accepted as independent of verbal ability. (Starkweather, 1971, p. 12).

Originality

In studies of creativity in adults, the subjects have been identified by their creative products which have met three criteria--originality, adaptiveness, and realization. In studies of creativity in young children, the adaptiveness and realization factors cannot be used as the criteria of creativeness because of their elusive quality; and therefore, attention must be focused on originality per se. However, if one does not accept originality alone as indicative of true creativeness, then this quality must be considered in relation to other measurable traits. In a study of the creative potential of young children, the relationships among measurable traits is provided by the creativity profiles of individual children.

In studies of creativity in adults, it has also been possible to discriminate among several closely related factors--originality,

elaboration, fluency, and flexibility. In creativity research with young children, this type of discrimination has not been possible in a meaningful way. The scoring of children's responses in terms of these factors is of questionable significance and would demand adult value judgments which are to be avoided whenever possible.

> In the development of each instrument, . . . the goal was always the development of a game which the child would want to play--a game in which his behavior provided an answer to the researcher's question . . . Adult judgments of the children's responses were avoided, and scoring problems were minimized by designing instruments which permitted simple behavioral responses that could be scored objectively. (Starkweather, 1971, p. 3).

Conformity-Nonconformity

The creative child, like the creative adult, is willing to be different; he may conform or not depending upon which behavior provides the more effective way of attaining his goal. He is free--his choice is not ruled by compulsion.

Behavioral evidence of conforming and nonconforming behavior can be found in any situation, social or impersonal, in which a child is given an opportunity to follow a model.

> The conformity-nonconformity tests /Starkweather Social Conformity Test and Starkweather Form Boards Test/ were designed to meet the following criteria: (a) The compulsive quality and the conforming quality of a child's behavior must be measured independently. The child who is a compulsive nonconformist is just as rigid as the child who is a compulsive conformist. (b) The tests must be adjustable in order that the opportunity to conform be of similar potency for all children. Conforming behavior is common when a child has an opportunity to conform to persons he likes, whereas the reverse is true in the case of persons he dislikes. Similarly, conforming behavior is to be expected when it involves the choice of a preferred object. (Starkweather, 1971, p. 4).

Willingness to Try the Difficult

The enjoyment of a calculated risk, or willingness to try the difficult, has been specifically referred to as a motivational characteristic of creative individuals. It is a characteristic for which there is behavioral evidence in childhood as well as in adulthood. Willingness to try the difficult implies that the child behaves with freedom rather than being compulsive about his risk-taking. This compulsive factor was discussed in relation to conformity-nonconformity and is a factor to be considered in the study of any characteristic of creativity. For example, MacKinnon (1965) pointed out that originality for originality's sake (compulsive originality) was not indicative of true creativeness.

> Another characteristic of the creative person is a willingness to try difficult tasks, to accept the challenge of a calculated risk--not a compulsive determination to attempt only the difficult, but rather a freedom to take the difficult road when that would enable him to achieve his goal or to take the easy road when that would most effectively lead to his goal. (Starkweather, 1968, p. 80).

Masculinity-Femininity

In discussing openness to experience, which is a characteristic of creative persons, MacKinnon (1965) spoke of the creative person's ability to recognize and give expression to aspects of inner experience and character, such as femininity in the case of the male and masculinity in the case of the female. It is for this reason that the study of masculinity-femininity in early childhood should be included in the study of creativity.

In any culture, it is the adults who label specific behavior as masculine or feminine. Where the socialization of young children is concerned, the behaviors labeled as masculine or feminine by the adults become the expectations which the adults have for the children. Consequently, in most studies of children's masculinity-femininity, adult judgments have been used to "score" the children's behavior. Starkweather (1968) disagrees with this approach and maintains that the attributes and behavior of the young children themselves, rather than the judgments of adults, should provide the criteria for masculinity and femininity.

> The Starkweather Masculinity-Femininity Test (M-F Test) measures the masculine and feminine preferences of preschool children. The test is designed so that the evaluation of what is masculine and what is feminine is based on the actual choices of the children being tested. The assumption underlying this design is that the behavior of boys is boy-behavior (masculine) and the behavior of girls is girl-behavior (feminine). (Starkweather, in Goldsmith, 1970, p. 44).

Social Relations

Social Relations can be defined as the interaction of two or more individuals or the influence of one individual upon another. The importance of social relations in the development of creativity was stressed by Moffatt (1969), whose research was concerned "with the creatively functioning, self-actualizing person and not with the person whose special-talent manages to emerge from incredible circumstances."

> To function well in society is a basic need of the creative person just as it is of others. Other people are an integral part of the creative person's environment; and if this environment suffocates his creative inpulses and gives him a feedback of poor self-conception, it will guide him toward poor mental health. (Rogers, 1965).

> The way in which an individual experiences social relationships is an essential factor in the nurturance or stifling of creative behavior. Some writers, e.g., Maslow (1959) and Erikson (1963), believe the basic needs for physical care, affection, security, and self-esteem must be met before creative behavior can emerge. Disagreement with this belief occurs when creative behavior is thought of narrowly in terms of creative genius and creative product-producing. . . This writer maintains that such creativity does not occur in a vacuum, but that in order for the creative person to be able to function as he does, other people must recognize and react to him at crucial times, and also that unless the creative person communicates with others, he is not recognized as being creative. (Moffatt, 1969, pp. 9-10).

Other Traits

Several other traits which have been identified as characteristic of the creative adult are evident in the behavior of children and may be measureable in early childhood. Among these traits are curiosity, flexibility, and independence.

MacKinnon (1965) has referred to the creative person as having a perceptive attitude which expresses itself in curiosity, and he has called curiosity the "hallmark of an inquiting mind." Thus far, in the creativity research with young children at Oklahoma State University, a test has been developed which measures one aspect of curiosity, i.e., a child's preference for the novel. This quality provides too narrow a focus for a satisfactory test of curiosity, and further work in this area is anticipated.

Flexibility and adaptiveness are similar, if not identical, qualities. MacKinnon's definition of creativeness includes originality, adaptiveness, and realization; and in studies of adults, there is frequent reference to the discrimination of originality, elaboration, fluency, and flexibility. In the creativity research with young

children, a flexibility test (Starkweather, 1969) has been designed to measure the ability to adapt to new situations when a change in behavior is required, or the ability to back off and look at something from a new angle. The test itself is complex and cumbersome, and extensive modification of the instrument is necessary.

Independence in thought and action is another fundamental characteristic of the creative person; and in the young child, both emotional independence and behavioral independence can be observed. A test of behavioral independence (Patton, 1969) has been developed as a part of the creativity research with young children. It is a most promising instrument, and acceptable refinement is anticipated in the near future.

Relationships among Characteristics

Creativity research with children of preschool age has been extremely limited. A few studies have been conducted in which the relationships among the characteristics of creativity have been correlated. The findings have been only suggestive, but they do throw some light on the possible relationships which one would find in looking at the creative potential of young children.

Masculinity-Femininity

The masculinity-femininity of preschool children has been studied in relation to independence, socioeconomic status, and conformity to parents. White (1967) studied the relationship between independence and masculinity-femininity. She found that the more independent girls were more feminine, and the less independent girls were less

feminine. McKinzie (1968) studied the relationship between socioeconomic status and masculinity-femininity. She found that middle-class girls showed a change from low femininity at age three to marked femininity at age four; whereas the lower-class girls showed the reverse of this, a shift from marked femininity at age three to low femininity at age four. Marx (1969) studied socio-economic differences in the relationship between masculinity-femininity and conformity to mothers. She found that the more masculine boys were more influenced by the opportunity to conform than were the less masculine boys. She also found a similar relationship for the four-year-old lower class girls; the more feminine girls were the more conforming. Goldsmith (1970) studied the relationship between masculinity-femininity and conformity to mothers and to fathers. She found that the boys who were conforming to both parents were significantly less masculine than other boys.

Independence

White (1967) studied independence and masculinity-femininity and found a significant relationship between the two for girls. The more independent girls were more feminine and the less independent girls were less feminine.

Patton (1969) studied the relationship between independence and impersonal conformity, both of which are motivational characteristics of creativity. She found no significant relationship between the two, indicating that the instruments she was using were, as designed, measuring characteristics independent of each other.

Social Relations

The social value or social acceptance of preschool children has been studied in relation to various aspects of creative ability--freedom of expression, originality, flexibility, and independence. Sims (1963) was interested in children's acceptance in their peer group and their creativity as indicated by freedom of expression in play. She found that the most creative children and the least creative children tended to be isolates; however, the most creative children seemed to be happy in their isolate status, whereas the least creative children were dissatisfied and attempted in various ways to gain acceptance in the group. Moffatt (1969) studied the relationship between the social acceptance of preschool children by their peer groups and several characteristics of creativity. She found a negative relationship between flexibility and social acceptance. In a pre-kindergarten group in particular, the children who scored high in flexibility scored low in social relations, and the children who scored low in flexibility scored high in social relations. Apparently the more rigid, or perhaps the more predictable, of the pre-kindergarten children were the more accepted in their social group.

Implications for Research

A number of valid and reliable instruments have been developed as a part of the creativity research with young children at Oklahoma State University; and a systematic study of the relationships among the characteristics of creativity is now possible. A better understanding of the broad relationships among these characteristics is needed; and

in addition, creativity profiles of individual children, which can be obtained by the measurement of specific characteristics, are needed as a foundation for the study of creative potential. Insofar as early childhood is concerned, it is this creative potential, rather than creative production, that must be understood. The availability of creativity profiles may also serve as a basis for selecting children to participate in a longitudinal study of creativity.

CHAPTER III

METHOD AND PROCEDURE

The purpose of this study was to examine the relationships among the characteristics of creativity which can be measured in early childhood. The battery of tests selected for use were developed as a part of the creativity research program at Oklahoma State University. These included: (1) a test of originality; (2) a form boards test designed to measure children's freedom to use conforming and nonconforming behavior; (3) a target game designed to measure children's willingness to try difficult tasks, i.e., designed to measure children's reaction to a calculated risk; (4) a test of masculinity-femininity; and (5) a test of social relations designed to measure each child's social value within his own peer group. This chapter includes a description of children who participated in the research, brief descriptions of the research instruments, and recommendations for the analysis of the data.

Subjects

The subjects who participated in this study were 103 preschool children, 47 boys and 56 girls. The age range was from three years three months to six years six months. All of the children were in attendance at private nursery schools and kindergartens in Oklahoma City and Stillwater, Oklahoma.

The description of subjects by age, sex, and number of tests administered is presented in Table I. Of the 103 children who participated in the study, 76 were given the total battery of five tests, and the remaining children were given a partial battery of two or more tests. The testing program was conducted over a period of four months; some of the children received the complete battery of tests during a two-week interval, and a few of the children were tested over a three-month interval. The specific age used for each child in the data analysis was his age as of June 1, 1970. Specifically, this was the age used in assigning children to each of the age groups.

Descriptive data and test scores for individual children are presented in Appendix A, Tables VIII and IX.

Research Instruments

Five instruments were available for use in the present research, and a detailed description of each is presented in Appendixes B-F. Brief descriptions, which are standard for the creativity research project at Oklahoma State University, are presented in this chapter.

All data gathering was done between March and July, 1970. No special sequence of testing was followed; however, the originality test and the form boards were the first tests administered to most of the children.

Originality

The Starkweather Originality Test was selected for the measurement of the children's originality. The test materials consist of three-dimensional abstract forms made of plastic foam. The children

TABLE I

DISTRIBUTION OF CHILDREN BY SEX, AGE, AND NUMBER OF TESTS ADMINISTERED

(N = 103)

	Total Battery of Five Tests	Partial Battery of Two or More Tests	Total
Older Children (5:0 and over)			
Boys	12	08	20
Girls	20	11	31
Total	32	19	51
Younger Children (4:11 and under)			
Boys	24	03	27
Girls	20	05	25
Total	44	08	52
All Children (3:3 to 6:6)			
Boys	36	11	47
Girls	40	16	56
Total	76	27	103

respond to the forms, one at a time, telling what each might be. The scoring is a simple numerical count of the number of different responses each child gives, and the high scores indicate the more original children.

A complete description of the originality test, its administration and scoring, is presented in Appendix B.

Conformity-Nonconformity

The Starkweather Form Boards Test was selected for the measurement of children's freedom to use conforming and nonconforming behavior. This test is designed to measure a child's tendency to conform in an impersonal situation. It consists of four form boards, picturing scenes familiar to most children of preschool age, e.g., a tree, a house, a playground, and a barnyard. In completing each form board, the child chooses between paired picture pieces; and the opportunity to conform is provided by black and white line drawings visible in each hole of the form board. The child is instructed to choose the picture pieces that he prefers, and he may or may not follow the model--the suggestion provided by the line drawings.

The scoring of the form boards test indicates the relationship between a child's conforming and nonconforming responses. Low scores are earned by children who are free to use both conforming and nonconforming behavior; whereas, high positive scores are earned by the more conforming children, and high negative scores are earned by the more nonconforming children.

A complete description of the form boards test, its administration and scoring, is presented in Appendix C.

Willingness to Try the Difficult

The Starkweather Target Game was selected for the measurement of children's willingness to try difficult tasks. This test consists of a target which is box-shaped and responds somewhat like a jack-in-a-box. When the bull's eye at the front of the target is hit, the lid opens and a surprise picture appears. The picture can be removed; and when it has been seen by the child, it is replaced by another picture. The design of the target game includes a pretest during which each child's actual ability is determined. The range of target distances is then adjusted so that the child, as he plays the game, makes choices between target distances that are easy and difficult relative to his own ability.

The scoring of the target game takes into consideration the skill with which the child actually plays the game, thereby offering a more refined adjustment for ability than is possible in the pretest alone. The score (B+D-S) is figured from the number of balls the child uses (B), and the number of times he chooses the difficult (D) in relation to the number of successes (S) he experiences while playing the game.

A complete description of the target game, its administration and scoring, is presented in Appendix D.

Masculinity-Femininity

The Starkweather M-F Test was selected for the measurement of children's masculinity and femininity. This test measures masculine and feminine preferences and is designed so that the evaluation of

what is masculine and what is feminine is based on the actual choices of the children being tested. The assumption underlying this design is that the behavior of boys is boy-behavior (masculine) and the behavior of girls is girl-behavior (feminine).

The materials for the Starkweather M-F Test include a picture booklet of 20 to 24 pages and individually mounted pictures, identical to those used in the picture booklet. (For the present research a booklet of 20 pages was used.) On each page there are three different gummed seal pictures which are arbitrarily chosen and arranged by the investigator so that a masculine, a feminine, and a neutral picture appear on each page. As the child is shown the booklet, page by page, he chooses the picture on each page that he prefers and he is given an identical picture to keep.

Each child's M-F score is based on the masculine or feminine value of each picture he chooses. The value of each picture is determined by the specific choices of all the children in the study. For example, a picture chosen by a majority of the boys and by few of the girls is weighted heavily as masculine. This method of scoring provides a measure of masculinity-femininity which is based on the actual choices of the children themselves rather than being based on the judgments of adults. For the children who participated in the present study, the possible range of M-F scores was from −227 (high feminine) to +239 (high masculine); and the actual range of scores was from −167 to +174.

A complete description of the M-F Test, its administration and scoring, is presented in Appendix E.

Social Relations

The Starkweather Social Relations Test was selected for the measurement of each child's social value within his own peer group. This test combines a picture interview technique with gift-giving, and is designed so that each child's social value is measured in terms of the extent to which his gift-giving is reciprocated by the children whom he chooses.

In the administration of the social relations test, each child is given his choice of several possible gifts with the understanding that the one he chooses is his to keep. For example, he may choose one of several balloons or small plastic toys, such as animals or cars. Three gifts identical to the one chosen by the child for himself are then placed on the table before him. A photograph of the peer group is then shown to him, and he is asked to name or point to three friends to whom he wants the gifts to be given. As the child makes his choices, he helps to place the gifts in pre-labelled envelopes designated as belonging to the children he has chosen. This procedure of gift-giving is repeated until the child has chosen friends for four different gifts, making a total of 12 choices.

The scoring of the social relations test is designed to show the relationship between the child's choices of other children and their choice of him. Possible scores range from 0.00 to 4.00. A score of 0.00, which is not uncommon, would be earned by a child who received no return on his investment in other children, i.e., no child to whom he gave a gift would have chosen him in return. A score of 4.00, which is highly improbable, would be earned by a child who received maximum

return on his investment in other children, i.e., he would have given his gifts to 12 different children and each would have chosen him four times in return. Thus far, in the testing of several hundred children, the highest score has been 1.89, which was earned by a child who considered everybody his friend, and who, in return, was considered a very special friend by almost everyone in his peer group.

A complete description of the social relations test, its administration and scoring, is presented in Appendix F.

Analysis of Data

Mann-Whitney U Tests and Spearman Rank Order Correlations were used in the analysis of data. All test scores were analyzed for age and sex differences, and all possible correlations were calculated for the five characteristics measured--originality, conformity-nonconformity, willingness to try the difficult, masculinity-femininity, and social relations.

CHAPTER IV

RESULTS

The present research was concerned with the relationships among the characteristics of creativity which can be measured in early childhood. This chapter includes (1) an analysis of age and sex differences for the five characteristics measured--originality, conformity-nonconformity, willingness to try the difficult, masculinity-femininity, and social relations; (2) an analysis of the relationships among these characteristics; and (3) a discussion of the creativity profiles of individual children.

Age and Sex Differences

The Mann-Whitney U Test was used to analyze all test scores for age and sex differences. The distribution of scores and the results of data analyses are presented in Tables II-VI.

Originality

For the Originality Test scores (Table II), age differences were significant for the boys, but were not significant for the girls. The older boys earned higher scores than did the younger boys (Medians: 27 and 16; $p = .003$). Sex differences in originality were not significant, but there was a tendency for the younger girls to score

higher than the younger boys (Medians: 21 and 16; p = .073). In both of these analyses, the younger boys earned the lower scores.

Conformity-Nonconformity

For the Conformity Test scores (Table III), age differences were significant for the boys, but were not significant for the girls. The older boys were freer to use conforming and nonconforming behavior than were the younger boys (Medians: 12 and 24; p = .022). There were no sex differences in conformity-nonconformity.

Willingness to Try the Difficult

For the Target Game (Table IV), neither age differences nor sex differences in W.D. scores were significant. The responses of boys and girls were comparable, and the responses of older and younger children were comparable; however, there were marked individual differences as indicated by the range of scores from 03 to 41.

Masculinity-Femininity

For the Masculinity-Femininity (M-F) Test scores (Table V), age differences were significant for boys and for girls. The older girls were more feminine than the younger girls (Medians: −102 and −66; p = .011); but the older boys were less masculine than the younger boys (Medians: +70 and +84; p = .052). Sex differences were also significant. Among the older children, the girls were more feminine than the boys were masculine (Medians: −102 and +70; p = .020); but among the younger children, the girls were less feminine than the boys

were masculine (Medians: −66 and +84; p = .036). An interaction between age and sex is apparent in these differences.

Social Relations

For the Social Relations Test scores (Table VI), age differences were significant for the boys, but were not significant for the girls. The older boys earned higher scores than did the younger boys (Medians: 0.81 and 0.44; p = .019). There were no sex differences in social relations.

TABLE II

DISTRIBUTION OF ORIGINALITY TEST SCORES
AND MANN-WHITNEY U TEST ANALYSES

	N	Median	Range	z	p
Boys	43	22	09 - 37	0.73	n.s.
Girls	46	21	03 - 38		
Older Boys	18	27	10 - 37	0.55	n.s.
Older Girls	24	24	03 - 38		
Younger Boys	25	16	09 - 36	1.45	.073
Younger Girls	22	21	08 - 36		
Older Children	42	25.5	03 - 38	2.43	.007
Younger Children	47	20	08 - 36		
Older Boys	18	27	10 - 37	2.73	.003
Younger Boys	25	16	09 - 36		
Older Girls	24	24	03 - 38	0.61	n.s.
Younger Girls	22	21	08 - 36		

TABLE III

DISTRIBUTION OF CONFORMITY TEST SCORES
AND MANN-WHITNEY U TEST ANALYSES

	N	Median	Range	z	p
Boys	43	20	00 - 78	0.10	n.s.
Girls	46	18	00 - 80		
Older Boys	18	12	00 - 78	0.72	n.s.
Older Girls	24	14	00 - 76		
Younger Boys	25	24	00 - 68	0.19	n.s.
Younger Girls	22	22	00 - 80		
Older Children	42	14	00 - 78	1.65	.049
Youmger Children	47	24	00 - 80		
Older Boys	18	12	00 - 78	2.00	.022
Younger Boys	25	24	00 - 68		
Older Girls	24	14	00 - 76	0.26	n.s.
Younger Girls	22	22	00 - 80		

TABLE IV

DISTRIBUTION OF TARGET GAME (W.D.) TEST SCORES
AND MANN-WHITNEY U TEST ANALYSES

	N	Median	Range	z	p
Boys	40	19	07 - 41	1.47	.070
Girls	48	22	03 - 37		
Older Boys	16	17.5	11 - 36	1.12	n.s.
Older Girls	24	22	03 - 37		
Younger Boys	24	19	07 - 41	0.83	n.s.
Younger Girls	24	20.5	08 - 35		
Older Children	40	22	03 - 37	0.36	n.s.
Younger Children	48	19.5	07 - 41		
Older Boys	16	17.5	11 - 36	0.01	n.s.
Younger Boys	24	19	07 - 41		
Older Girls	24	22	03 - 37	0.34	n.s.
Younger Girls	24	20.5	08 - 35		

TABLE V

DISTRIBUTION OF MASCULINITY-FEMININITY (M-F) TEST SCORES
AND MANN-WHITNEY U TEST ANALYSES

	N	Median	Range	z	p
Boys	46	+78.5	-67 to +174	0.05	n.s.
Girls	54	-78.5	+48 to -167		
Older Boys	19	+70	-67 to +152	2.03	.020
Older Girls	29	-102	+48 to -162		
Younger Boys	27	+84	-45 to +174	1.79	.036
Younger Girls	25	-66	+21 to -167		
Older Children	48	-53	-162 to +152		
Younger Children	52	+11	-167 to +174		
Older Boys	19	+70	-67 to +152	1.61	.052
Younger Boys	27	+84	-45 to +174		
Older Girls	29	-102	+48 to -162	2.26	.011
Younger Girls	25	-66	+21 to -167		

TABLE VI

DISTRIBUTION OF SOCIAL RELATIONS TEST SCORES
AND MANN-WHITNEY U TEST ANALYSES

	N	Median	Range	z	p
Boys	42	0.565	0.00 - 1.89	0.38	n.s.
Girls	49	0.65	0.00 - 1.65		
Older Boys	15	0.81	0.13 - 1.89	0.53	n.s.
Older Girls	27	0.65	0.00 - 1.65		
Younger Boys	27	0.44	0.00 - 1.55	0.39	n.s.
Younger Girls	22	0.565	0.08 - 1.22		
Older Children	42	0.67	0.00 - 1.89	2.28	.011
Younger Children	49	0.54	0.00 - 1.55		
Older Boys	15	0.81	0.13 - 1.89	2.07	.019
Younger Boys	27	0.44	0.00 - 1.55		
Older Girls	27	0.65	0.00 - 1.65	1.07	.141
Younger Girls	22	0.565	0.08 - 1.22		

Relationships among Characteristics

Spearman rank order correlations were used in the analysis of the relationships among the characteristics. All possible correlations were calculated for the following five variables: originality, conformity-nonconformity, willingness to try the difficult, masculinity-femininity, and social relations. Each variable was correlated with every other variable, and the ten resulting correlations were calculated for each of the following subject groups: all children, all boys, all girls, older children, younger children, older boys, older girls, younger boys, and younger girls. The total number of correlations was 90; and of these, seven were significant and three approached significance. Correlation coefficients are presented in Table VII.

Originality and Conformity

For the older girls, a significant positive correlation existed between originality and freedom to use conforming and nonconforming behavior (rho = +0.406; $p < .05$). The more original girls were more free than were the less original girls. This relationship between these two characteristics is also reflected in significant correlations for older children and for all children.

Originality and W.D.

For the older girls, a significant positive correlation existed between originality and willingness to try the difficult (rho = +0.493; $p < .02$). The more original girls were more willing to try the difficult than were the less original girls. This relationship between these two

TABLE VII

SPEARMAN RANK-ORDER CORRELATIONS

Variables	Subjects	N	rho	p
Originality and Conformity	All S's	89	+0.242	$<.05$
	Older S's	38	+0.419	$<.01$
	Older Girls	24	+0.406	$<.05$
Originality and W.D.	All S's	84	+0.198	$<.10$
	All Girls	44	+0.308	$<.05$
	Older S's	38	+0.419	$<.01$
	Older Girls	22	+0.493	$<.02$
Conformity and M-F	All Boys	42	-0.308	$<.05$
Social Relations and W.D.	All S's	79	+0.190	$<.10$
	All Girls	43	+0.256	$<.10$

characteristics is also relfected in significant correlations for older children, for all girls, and for all children.

Conformity and M-F

For the boys, younger and older combined, a significant negative correlation existed between masculinity and conformity-nonconformity (rho = -0.308; $p < .05$). Boys who scores high in masculinity were less free in their use of conforming and nonconforming behavior; they responded by conforming. On the other hand, boys who scored low in masculinity responded freely in their use of both conforming and nonconforming behavior.

Social Relations and W.D.

For the girls, younger and older combined, there was a tendency toward a positive correlation between social relations and willingness to try the difficult (rho = 0.256; $p < .10$). The girls who scored high in social relations tended to score high in the Target Game, i.e., in willingness to try the difficult.

Summary of Statistical Analyses

Age and Sex Differences

1. There was a significant age difference in originality for for the boys. The older boys were more original than the younger boys.

2. There was a significant sex difference in originality for the younger children. The girls were more original than the boys.

3. There was a significant age difference in conformity-nonconformity for the boys. The older boys were freer to use conforming and nonconforming behavior than were the younger boys.

4. There were neither age differences nor sex differences in the children's willingness to try the difficult.

5. An interaction between age and sex was apparent in masculinity-femininity. The older girls were more feminine than the younger girls, but the older boys were less masculine than the younger boys. Among the older children, the girls were more feminine than the boys were masculine; but among the younger children, the girls were less feminine than the boys were masculine.

6. There was a significant age difference in social relations for the boys. The older boys earned higher scores than did the younger boys.

Relationships among Characteristics

1. Originality and conformity-nonconformity were positively correlated for the older girls. The more original girls were freer in their use of conforming and nonconforming behavior.

2. Originality and willingness to try the difficult were positively correlated for the older girls. The more original girls were more willing to try the difficult.

3. Conformity-nonconformity and masculinity-femininity were negatively correlated for the boys. Boys who scored high in masculinity were less free in their use of conforming and nonconforming behavior.

4. There was a positive correlation between social relations and willingness to try the difficult for the girls, although the correlation was not statistically significant. The girls who scored high in social relations tended to score high in willingness to try the difficult.

Creativity Profiles*

Creativity profiles of individual children are presented as bar graphs in Appendix G, page 103. Each child's performance on the individual tests is shown by the bars in his graph. The length of each bar indicates the relative position of the child on that test as determined by the ranking of the scores of the 76 children to whom all five of the tests were administered. The center vertical line in each graph represents the median score.

The upper four bar graphs on each page are profiles of older children (5:0 and older) and the lower four are profiles of younger children (4:11 and younger). The bar graphs on the left are profiles of children scoring low in the characteristic named in the figure title (e.g., originality), and those on the right are of children scoring high in that characteristic. For example, in Figure 1 on page 104, Child M-1736 and Child M-1500 (Profiles 1 and 2) are the two older boys who earned the lowest scores on the originality test; and Child M-1518 and Child M-1764 (Profiles 5 and 6) are the two older boys who earned the highest scores on the originality test. Similarly, for the profiles of the younger boys on the same page,

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*The interpretation of the creativity profiles is presented here by Elizabeth K. Starkweather, Ph.D., principal investigator in the creativity project of which this research is a part.

two are for those earning the lowest scores and two are for those earning the highest scores.

One method of interpreting the children's profiles, which is objective but not entirely satisfactory, is to assume that the longer the bar on the graph, the greater the contribution of that characteristic to creative potential. With this as a guideline, examples of creative potential can be found in Profiles 5, 7, 29, 30, 46, and 53. These particular children may have excellent creative potential. However, consideration of the relationships among characteristics suggests other profiles as being equally indicative of creative potential, and some of the unique relationships can be interpreted in terms of known research findings.

Originality

A long bar for originality on the profile graph indicates high ability in originality, which is logically related to creative potential. The children whose profiles are mentioned above all scored high in originality.

Conformity-Nonconformity

A long bar for conformity-nonconformity (C-NC) indicates freedom to use conforming and nonconforming behavior, and this also is logically related to creative potential. In previous research this freedom has been found to be significantly related to originality. In Profile 5, the picture is one of creative potential; but in Profile 6, in which the short C-NC bar indicates compulsive conformity,

the child's high originality score may well have been earned as the result of his merely doing what he believed was expected of him; and in that case, his originality cannot meet the criteria of adaptiveness and realization included in MacKinnon's definition of true creativeness.

Willingness to Try the Difficult

A long bar for the target game (W.D.) indicates willingness to try difficult tasks. This may or may not be related to creative potential and must be considered in relation to the other characteristics. If a child is compulsive about choosing to do the difficult, he may be like the compulsive conformist or nonconformist who lacks the freedom necessary for creative expression. This relationship is illustrated in Profiles 40 and 47, in which the W.D. bars are the only long bars. These two children apparently chose difficult tasks compulsively. On the other hand, Profiles 21 and 41 present the opposite picture. These children scored high in all characteristics except willingness to try the difficult. The short W.D. bars suggest that these children were free to choose the easy or the difficult, and this quality lends strength to their profiles which, with this interpretation, suggest escellent creative potential.

In the data analysis in the present research, a positive relationship was found between originality and willingness to try the difficult. It is probable that a positive relationship between these two characteristics is a common finding; but the exceptions cited here serve to underscore the importance of considering the relationships among all possible variables when studying creativity.

Masculinity-Femininity

A long bar for masculinity-femininity (M-F) indicates high masculinity for a boy or high femininity for a girl. This may or may not be related to creative potential. On the one hand, research has indicated that girls who score high in femininity are behaviorally independent, which is a quality accepted as necessary for creative expression. On the other hand, it has been found that creative adults are able to give expression to aspects of inner experience, such as femininity in the case of males and masculinity in the case of females. It may be that the freedom necessary for creative expression is experienced by children who have clearly identified their sex-roles as masculine or feminine; and yet this very freedom may be the quality that makes it possible for creative adults to adhere less rigidly to culturally dictated sex-role behavior.

The sex-role freedom found in creative adults is suggested in Profiles 57 and 58. These two girls scored high in all characteristics except femininity. They were free to use conforming and nonconforming behavior and free to choose the easy or the difficult. If the interpretation of their M-F scores is valid, then these girls must be accepted as having creative potential.

The possibility of high M-F scores being the result of a compulsive quality is suggested by Profiles 11 and 55. Both of these children have long M-F bars in their profiles. For the girl, this is the only high score; but for the boy, an equally long W.D. bar suggests a comparable compulsive quality in willingness to dry difficult tasks. A quality of compulsiveness inhibits creative expression. The profiles of these children do not show creative potential.

Social Relations

Social relations, or a child's social value within his own peer group, is an important aspect of the whole creativity picture. The quality of an individual's social relations is a major factor in the stifling or nurturance of creative behavior.

High and low social relations scores can be found in the profiles of children who are potentially creative. Profiles 37 and 77 show children whose social relations scores are high and who present a picture of having creative potential. On the other hand, Profiles 24 and 76 show children whose social relations scores are low and who, nonetheless, present a picture of having creative potential.

High and low social relations scores can also be found in the profiles of children who do not present a picture of creative potential. This is the case in Profiles 72 and 48 in which the social relations scores are high, and in Profiles 40 and 63 in which the social relations scores are low.

Implications

The creativity profiles of individual children provide a foundation for the study of creative potential in early childhood, and they may also serve as a basis for selecting children to participate in a longitudinal study of creativity.

A positive relationship between originality and freedom to use conforming and nonconforming behavior (C-NC) is suggested in many of the profiles. When the combination of high scores in these two areas is accepted as a major indication of creative potential, evidence of

creative potential can then be found in fifteen of the profiles, eleven of these being for older children and four being for younger children. This apparent age difference in creative potential has several possible explanations. (1) The characteristics indicative of creative potential may become evident as children grow older; (2) if the data for older and younger children were analyzed separately, subtle differences among these younger children might be found; and/or (3) the research instruments may not be sufficiently sensitive for use with the younger children. Further analysis of the present data is warranted.

Two of the characteristics measured in the present research were ones in which compulsive behavior might be indicated by a long bar on the profile graph. These were willingness to try the difficult and masculinity-femininity. However, a compulsive quality in these areas can only be inferred if the child also shows compulsive behavior in his conforming or nonconforming behavior. (The scoring of the conformity-nonconformity instrument is such that a low score definitely indicates compulsive behavior.) Compulsive behavior in any area can inhibit creativity.

In both masculinity-femininity and social relations, high and low scores were found when creative potential was present and when it was absent. The unpredictability of the relationships among these variables suggests that in the search for factors which influence the development of creative potential and its ultimate expression in creative learning, research should be planned in which these variables are controlled.

A longitudinal study of creativity is needed--a study that would follow children from the preschool years at least through the years of

elementary school. The selection of children for such a study could be guided by the creativity profiles in order that a variety of known profiles be represented in the longitudinal study.

CHAPTER V

SUMMARY AND IMPLICATIONS

The purpose of this study was to gain a better understanding of young children's creative potential by examining the relationships among the characteristics of creativity which can be measured in early childhood. The five characteristics measured were originality, conformity-nonconformity, willingness to try the difficult, masculinity-femininity, and social relations.

The subjects who participated in this study were 103 preschool children, 47 boys and 56 girls. The ages of the children ranged from three years three months to six years six months. All of the children were in attendance at private nursery schools and kindergartens in Oklahoma City and Stillwater, Oklahoma.

The battery of tests selected for use were developed as a part of the creativity research program at Oklahoma State University. These included: (1) a test of originality; (2) a form boards test designed to measure children's freedom to use conforming and nonconforming behavior; (3) a target game designed to measure children's willingness to try difficult tasks, i.e., designed to measure children's reaction to a calculated risk; (4) a test of masculinity-femininity; and (5) a test of social relations designed to measure each child's social value within his own peer group.

The data were analyzed for age and sex differences. The major findings were as follows: (1) There was a significant age difference in originality for the boys. The older boys were more original than the younger boys. (2) There was a significant sex difference in originality for the younger children. The girls were more original than the boys. (3) There was a significant age difference in conformity-nonconformity for the boys. The older boys were freer to use conforming and nonconforming behavior than were the younger boys. (4) There were neither age differences nor sex differences in the children's willingness to try the difficult. (5) An interaction between age and sex was apparent in masculinity-femininity. The older girls were more feminine than the younger girls, but the older boys were less masculine than the younger boys. Among the older children, the girls were more feminine than the boys were masculine; but among the younger children, the girls were less feminine than the boys were masculine. (6) There was a significant age difference in social relations for the boys. The older boys earned higher scores than did the younger boys.

The data were also analyzed for the relationships among the variables. The major findings were as follows: (1) Originality and conformity-nonconformity were positively correlated for the older girls. The more original girls were freer in their use of conforming and nonconforming behavior. (2) Originality and willingness to try the difficult were positively correlated for the older girls. The more original girls were more willing to try the difficult. (3) Conformity-nonconformity and masculinity-femininity were negatively correlated for the boys. Boys who scored high in masculinity were

less free in their use of conforming and nonconforming behavior. (4) There was a tendency toward a positive correlation between social relations and willingness to try the difficult for the girls. The girls who scored high in social relations tended to score high in willingness to try the difficult.

Implications for Future Research

Further analysis of the present data is warranted. (1) The data for the older and the younger children should be analyzed separately. Few of the younger children had profiles which suggested creative potential; and it is possible that subtle differences among these children would be found if their data were analyzed independent of that of the older children. (2) The creativity profiles of all of the children should be studied. The profiles presented here were limited to those of children who scored either high or low in at least one of the five characteristics measured. As a result, profiles were never made for ten of the children and they were not included in the discussion. (3) The data should be reexamined in profile form using raw scores instead of rank order scores. The scores which are at the extremes in the creativity profiles are of major importance; and it is possible that these extreme scores are lost when the profiles are constructed from rank order scores.

The present study was concerned with the relationships among five characteristics of creativity--five which could be measured reliably at this time. Currently, instruments are being developed for use in the measurement of other characteristics related to creativity; and when these are perfected, e.g., tests of independence and curiosity,

research should be initiated which will include these characteristics in a larger profile study. One possibility would be to select children from the present study when new research is initiated, and in this way, a larger profile study could be dovetailed with the start of a longitudinal study.

For some time the need for a longitudinal study of creativity has been recognized. The participants in the various creativity conferences which have been held over the past ten to fifteen years, have recognized the need for creativity research with young children. Ways of studying creativity in early childhood had to be developed before an adequate longitudinal study could be initiated.

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APPENDIX A

TABLE VIII

DESCRIPTIVE DATA AND TEST SCORES FOR BOYS PARTICIPATING IN A PROFILE STUDY OF CHARACTERISTICS RELATED TO CREATIVITY

(N = 47)

Sex and Code No.	Age	Originality Form	Originality Score	Conformity Form Boards	W.D.	M-F	Social Relations
M-1782	3:3	A	10	32	41	078	0.00
M-1747	3:5	A	16	06	13	133	0.09
M-1866	3:6	A	09	52	--	072	1.55
M-1869	3:9	A	14	24	13	162	0.44
M-1749	3:9	--	--	--	--	055	1.25
M-1744	3:10	--	--	--	--	129	0.58
M-1856	3:10	A	09	66	24	141	0.25
M-1863	3:11	A	10	14	14	073	0.79
M-1723	4:0	A	11	10	28	139	0.27
M-1834	4:1	B	15	16	10	-045	0.09
M-1862	4:1	B	15	64	17	079	1.00
M-1638	4:3	A	22	68	08	150	0.21
M-1864	4:3	A	20	58	13	064	0.75
M-1853	4:3	A	22	30	13	-009	0.20
M-1724	4:4	B	31	56	07	080	0.12
M-1843	4:5	A	30	44	23	098	0.67
M-1792	4:5	A	21	10	19	059	0.33
M-1850	4:5	A	15	32	34	174	0.40
M-1859	4:6	A	11	34	21	084	1.00
M-1766	4:8	A	22	-02	18	094	0.17
M-1807	4:9	B	20	-02	21	042	0.54
M-1844	4:9	A	36	22	19	084	0.37
M-1835	4:10	A	10	24	22	123	0.56
M-1544	4:10	A	28	20	33	057	0.57
M-1857	4:11	A	16	00	22	004	0.25
M-1808	4:11	B	32	-20	23	107	1.00
M-1860	4:11	A	09	58	15	092	0.90
M-1809	5:0	B	22	-06	13	015	1.35
M-1821	5:1	B	29	42	22	152	----
M-1548	5:1	A	26	-08	27	072	1.89
M-1822	5:3	B	24	06	14	009	----
M-1803	5:3	A	32	00	24	125	0.45
M-1764	5:3	A	37	78	28	085	0.58
M-1823	5:3	B	11	58	14	---	----
M-1824	5:4	B	32	-06	12	076	0.23
M-1704	5:6	A	23	00	13	093	0.90
M-1825	5:6	B	35	-02	36	049	1.18
M-1826	5:6	B	23	02	--	020	0.52
M-1828	5:7	B	35	26	11	004	----
M-1827	5:7	B	15	-10	25	027	0.13
M-1763	5:7	A	28	20	21	108	0.81
M-1829	5:8	B	29	-14	--	070	----
M-1500	5:10	A	10	-18	11	067	1.00
M-1736	6:0	A	14	-28	14	083	0.45
M-1547	6:4	--	--	--	--	-005	1.20
M-1518	6:4	A	36	14	23	092	1.15
M-1757	6:6	--	--	--	--	-067	0.64

TABLE IX

DESCRIPTIVE DATA AND TEST SCORES FOR GIRLS PARTICIPATING IN A PROFILE STUDY OF CHARACTERISTICS RELATED TO CREATIVITY

(N = 56)

Sex and Code No.	Age	Originality Form	Originality Score	Conformity Form Boards	W.D.	M-F	Social Relations
F-1861	3:3	--	--	--	21	-003	0.38
F-1867	3:4	A	29	24	30	-066	0.73
F-1753	3:7	A	19	-02	16	-069	0.83
F-1842	3:7	--	--	--	31	-029	----
F-1868	3:8	A	11	34	33	-011	0.85
F-1754	3:11	--	--	--	--	021	0.21
F-1854	3:11	A	17	08	18	-014	0.36
F-1852	4:0	B	15	-02	18	-035	0.25
F-1728	4:1	A	36	-06	13	-048	1.12
F-1607	4:1	A	30	72	26	-133	----
F-1865	4:2	B	20	36	19	-072	0.17
F-1851	4:2	B	13	16	13	-084	0.16
F-1734	4:3	A	32	78	25	007	0.90
F-1752	4:5	A	32	04	11	-096	0.82
F-1783	4:5	A	20	-04	17	-167	----
F-1845	4:5	A	23	38	08	-103	0.08
F-1846	4:6	A	09	62	14	049	0.67
F-1855	4:7	A	31	76	29	-000	1.17
F-1767	4:8	A	13	04	22	-109	1.22
F-1795	4:9	B	21	78	35	015	0.22
F-1771	4:9	A	35	-02	30	-105	0.33
F-1833	4:10	A	21	-20	29	-056	0.55
F-1793	4:10	B	21	80	12	-110	0.58
F-1572	4:11	A	23	00	24	-079	0.91
F-1796	4:11	B	08	36	20	-126	0.12
F-1849	5:1	A	11	-06	22	-162	1.36
F-1732	5:2	A	16	38	30	-143	1.65
F-1689	5:2	A	31	-56	27	-136	0.34
F-1740	5:3	--	--	--	--	-104	0.58
F-1731	5:4	A	03	76	23	-121	0.77
F-1768	5:4	A	09	36	16	-068	----
F-1765	5:4	A	31	04	21	-114	0.95
F-1571	5:5	A	18	14	12	-046	0.26
F-1729	5:5	A	35	-06	31	-085	0.67
F-1733	5:5	A	15	34	19	-102	0.27
F-1812	5:7	B	16	46	18	-107	0.00
F-1815	5:9	B	19	40	16	-054	0.61
F-1512	5:9	A	29	08	10	-108	0.67
F-1755	5:9	--	--	--	03	----	0.54
F-1888	5:10	A	23	-04	22	-131	0.61
F-1816	5:10	B	25	20	19	-063	0.65
F-1769	5:10	A	14	42	14	-147	----
F-1801	5:10	A	21	26	23	048	0.72
F-1818	5:11	B	11	06	--	-015	----
F-1817	5:11	B	38	-08	--	-078	----
F-1839	6:0	A	38	08	29	-051	0.65
F-1480	6:0	A	31	00	34	-081	0.70
F-1481	6:1	A	36	24	24	-130	1.45
F-1730	6:1	A	28	-08	22	-122	0.55
F-1838	6:1	--	--	--	37	----	-.23
F-1840	6:2	A	32	06	30	-115	0.91
F-1525	6:2	A	33	14	22	-022	0.50
F-1737	6:5	--	--	--	--	-127	1.07
F-1725	6:6	--	--	--	--	-077	0.19
F-1871	6:6	--	--	--	--	-062	1.58
F-1738	6:8	--	--	--	--	-076	0.96

APPENDIX B

STARKWEATHER ORIGINALITY TEST

FOR PRESCHOOL CHILDREN*

developed by
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The Starkweather Originality Test is designed to measure the creative potential of preschool children. In the test, no attempt is made to differentiate among the various factors of creative ability, such as flexibility, fluency, originality, and elaboration. It is possible that all of these factors contribute to a high score on the Originality Test, and it is also possible that strength in one factor alone may be sufficient to produce a high score.

Recommended Age Range

Approximately 3 years 6 months to 6 years 6 months.

Children younger than 3 years 6 months can be given the Originality Test if their ability to communicate verbally is satisfactorily demonstrated during the pretest or warm-up session.

Older children obtain higher test scores than do younger children. When the test is administered to older children, e.g., seven-year-olds, the median score is apt to be near the ceiling of the test, with the result that the less original children are identified but the more original children are not.

The Pretest

The pretest consists of eight plastic foam pieces, two each of four shapes. One of each shape is white and the other is pastel.

The pretest pieces are placed on a table before the child, and he is encouraged to manipulate them and talk about them. He may be asked a question such as, "Do you see a piece that looks like something?"

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*The Starkweather Originality Test was developed as part of a creativity research program supported by the Research Foundation at Oklahoma State University.

or "Could one of them be something?" When the child responds, the experimenter agrees with his comment, whatever it is, and moves that piece to one side. He then encourages the child to talk about another piece.

If the child does not respond, the experimenter picks up the rectangular piece and asks, "What could this be?" If the child still does not respond, the experimenter makes a suggestion in the form of a question, e.g., "Do you think it could be a window?" The experimenter then moves this piece to one side and encourages the child to talk about another piece.

During the pretest, the child is encouraged to think of different responses for the various pieces. If he gives the same response for more than one piece, his response is accepted, but he is asked to think of something else that the piece might be. For example, if the child says that two different pieces could be a door, the experimenter accepts his response and at the same time encourages him to think of something different. "Yes, it certainly could be a door, but we already have one door. Can you think of something else that it could be?" To complete the pretest satisfactorily, the child must give at least five different responses.

The Originality Test

The test proper consists of 40 plastic foam pieces, four each of ten different shapes. The identically shaped pieces are made in four colors -- red, blue, green, and yellow.

Administration. When the child has satisfactorily completed the pretest, a box containing half the test pieces is placed on the table before him. The box contains 20 pieces, two of each shape in assorted colors. The child is encouraged to take the pieces one at a time and tell what each might be. The experimenter may say, as he places the box on the table, "Now we have all these. You take one -- any one -- and tell me what it could be." The child's response is accepted, and approval is given by saying something such as, "All right" or "It certainly could be." As the child finishes with each piece, he is directed to put it into a second box (the inverted lid) which has been placed near him for that purpose.

Whether or not the child gives different responses for the various shapes, his responses are accepted and approved. The child is NOT encouraged to give different responses to pieces which are of the same shape as was done in the pretest.

Occasionally a child will take two or more pieces and construct something with them as he talks. When this happens, he is encouraged to respond to each piece separately. For example, "All right, but what could this piece be all by itself?"

When the child has completed the first box of test pieces, the box containing the remaining 20 pieces is presented to him in a similar manner.

Scoring. The test provides four opportunities for the child to respond to each shape, making a total of 40 responses. Each child's score is the number of different responses he gives, with the maximum possible score being 40. Responses are scored in the order in which they appear on the score sheet with the child's responses to the first 20 pieces (the first box) being scored before his responses to the last 20 pieces are scored. Credit is given for each response which is different from all previous responses. Credit is given for objects which might be in the same category, such as a golf ball and a baseball. Credit is not given for an object which is named a second time and altered by a minor adjective, such as a ball and a big ball. No credit is given for a play on words, such as kigless, pigless, and sigless. (See Scoring directions.)

Evaluation of the Originality Test

Inter-judge reliability in scoring was determined by a comparison of two sets of scores. (1) The responses of individual children were scored jointly by two judges who participated in the development of the test; and (2) the same responses were scored by another person, trained in child development, but who had no experience with the test and who had no instructions other than the written directions for scoring. The coefficient of correlation (Pearson product-moment) between the two sets of judges' scores was +0.989, significant beyond the .01 level. In view of these findings, the directions for scoring were accepted as adequate. Their use should assure reliable scoring.

The internal consistency of the instrument was demonstrated by means of a split-half correlation (Spearman-Brown formula). A coefficient of +0.932 ($p < .01$) indicated that the test was reliable.

The validity of the instrument was demonstrated by comparing teachers' judgments with children's scores. Each child who scored high in originality was paired with each child who scored low, and the teachers were then asked to indicate the child who was the more original in each pair. Teachers' judgments were in the direction of the originality scores in 106 pairs out of a total of 153. A Chi-square analysis indicated this extent of agreement to be statistically significant. ($\chi^2 = 22.752$; $p < .001$).

The validity of the instrument was also demonstrated by comparing the originality scores of 13 children with their freedom of expression. The freedom scores were determined by the variety of each child's play responses when given an opportunity to play alone with a series of simple toys. A rank order correlation indicated a statistically significant agreement between these two sets of scores (rho = +0.687; $p < .05$). The Originality Test was accepted as valid.

Test results indicate age differences in originality, but not sex differences. In a group of 80 children ranging in age from 3 years 6 months to 5 years 11 months, the older children earned the higher scores in originality. (χ^2 = 17.39; $p < .01$).

Two forms of the Originality Test (Form-A and Form-B) have been developed for use in test-retest research. The comparability of the two forms has been demonstrated by a product-moment correlation, yielding a coefficient of +0.904 ($p < .01$). For this comparison, 18 children ranging in age from 3 years 4 months to 5 years 11 months were tested with both forms of the test.

The Originality Test requires verbal responses; nevertheless, the originality scores are independent of verbal ability. This was demonstrated by a correlation of Peabody Picture Vocabulary scores (verbal ability) and Originality Test scores. The product-moment correlation coefficients for these two sets of scores were +0.192 for Form-A and +0.162 for Form-B, neither of which was statistically significant.

Unpublished manuscript
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DIRECTIONS FOR SCORING THE ORIGINALITY TEST

A. Score the responses in the order in which they appear on the score sheet, first scoring columns A and B together and then scoring columns C and D together.

(1A - 1B - 2A - 2B - 3A - 3B - etc.)

B. Mark each response either + for credit or - for no credit.

Mark a response +, if it is different from all previous responses.

When in doubt, give the child credit.

C. Categories of objects

1. A child may name objects which are similar in category.

   The child receives credit for each different type of object in the category.

   Ex: golf ball (+), baseball (+), moth ball (+)

2. A child may name a category and name specific objects in the category.

   Ex: ball (+), rubber ball (+), baseball (+)

D. Examples of no credit

1. A child does not receive credit when he combines two previous responses for which he has received credit.

   Ex: Tree (+), cookie (+), tree cookie (-)

2. A child does not receive credit when he names an object a second time altering it with a minor adjective.

   Ex: ball (+), big ball (-), half ball (-)

   Ex: duck (+), part of a duck (-)

   Ex: egg (+), round egg (-)

   Ex: red ball (+), blue ball (-)

3. The child receives no credit for a play on words.

   Ex: kigless (-), pigless (-), sigless (-)

E. Some children look about the room for ideas. This is noted on the score sheet. For such responses, the child receives credit if there is a possible relationship between the response and the test form.

STARKWEATHER ORIGINALITY TEST

FORM - A FOR PRESCHOOL CHILDREN FORM - A

Name Child F-1888 Sex F Number 1888

Date 7-17-70 Birthdate 8-29-64 Age 5:11

Testing Place Kiddie Klub

SCORE 23

	A	B	C	D
1. 	table +	table -	Party table +	Pickup truck +
2. 	"O" +	"O" -	can end +	telescopes +
3. 	Block +	Box +	Block -	Box -
4. 	"e" +	9 +	6 +	9 -
5. 	tester totter +	Play boat +	car +	car -
6. 	Cave +	Cave -	Cave -	Cave -
7. 	raindrop +	raindrop -	raindrop -	raindrop -
8. 	Ball +	Balloon +	mesher +	Ball -
9. 	part of a rainbow +	eye +	part of a dress -	Boat +
10. 	Part of a dress +	dress -	dress -	Dress -

STARKWEATHER ORIGIANLITY TEST

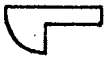
FORM - B FOR PRESCHOOL CHILDREN FORM - B

Name Child F-1888 Sex F Number 1888

Date 7-28-70 Birthdate 8-29-64 Age 5:11

Testing Place Kiddie Klub

SCORE 32

	A	B	C	D
1. 	"U" +	door +	Bridge +	Part of an "A" +
2. 	can't think of anything −	can't think of anything −	thing you see how big they are +	thing you see how much you weigh +
3. 	opening of a cave +	cave −	Bridge −	coffee table +
4. 	hair spray top +	something you sit on +	cookie +	loose nail that is going to fall
5. 	"L" +	"R" +	"L" made out of cotton +	"R" −
6. 	Rainbow +	part of a round pillow +	Rocking bed +	"C" +
7. 	Bear face +	Buffalo face +	Pig face +	head with a bump on top +
8. 	cut out picture +	Snowman +	Snowman −	part of a man +
9. 	Stick +	Part of a gate +	ironing board +	door +
10. 	Ride at amusement park +	Record Player +	Cookie −	half an apple +

APPENDIX C

STARKWEATHER FORM BOARDS CONFORMITY TEST

FOR PRESCHOOL CHILDREN*

developed by
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The Starkweather Form Boards Test is a research instrument designed to measure conforming and nonconforming behavior in an impersonal situation. The form boards provide opportunities for the young child to make choices in situations in which he can follow a model or respond freely according to his own preferences; and the variety of picture pieces insures that each child is offered some pictures that he prefers more than others. The design of the form boards test is such that the compulsive quality and the conforming quality of a child's behavior are measured independently; and therefore, the test is able to discriminate between children who are compulsive conformists or nonconformists and children who are free to use either conforming or nonconforming behavior.

The Instrument

The Starkweather Form Boards Test consists of four form boards, approximately 12" x 14" in size, picturing scenes familiar to young children. These include a tree, a house, a playground, and a barnyard (Figures 1-4). Each form board has five holes, and for each hole there are four different pieces which can be used to complete the picture. The form boards are made of masonite. The boards and picture pieces are colored; and the opportunity to conform is provided by black and white line drawings placed behind each form board.

The black and white line drawings are painted on pieces of masonite, referred to as slides, and the drawings are positioned so that the appropriate picture shows in each hole of the form board when the slide is in place. For each form board, there are four slides; and these are paired to correspond with the pictures shown to the child during the test. In Figures 1-4, the paired pictures to the left of each form board are those for slides A and B, and the pictures to the right are those for slides C and D. For example, slides A and B

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*This research was supported by the U.S. Office of Education, Cooperative Research Project #1967, and administered by the Research Foundation, Oklahoma State University.

for the Tree Form Board have line drawings for the following paired pictures: Boy-Kite, Cloud-Airplane, Branch-Bees, Squirrel-Butterfly, and Rabbit-Grass. The pairing of pictures is also indicated on the sample score sheet on page 79.

The pairing of the picture pieces for the form boards is essential for the identification of conforming and nonconforming behavior. In the Tree Form Board (Figure 1), a line drawing of a rabbit is shown at the base of the tree. To complete this part of the picture, the child chooses between a rabbit and grass. If he chooses the rabbit, he is following the model; but whether he is conforming or showing a preference for the rabbit is a question which cannot be answered until the child has a second session with the form boards approximately one week later. At that time the child again chooses between the rabbit and the grass, but the line drawing is of the grass. The underlying assumption is that the child who really prefers the rabbit will choose the rabbit during both sessions if he is free to use conforming and nonconforming behavior; but the child who is a conformist will choose the rabbit only when the line drawing of the rabbit is shown, and the nonconformist will choose the rabbit only when the line drawing of the grass is shown.

The two sessions with the form boards provide the child with 80 choices between paired picture pieces. The conforming child will, for the most part, choose the pictures which correspond to the line drawings. The child who is free will choose the pictures he prefers, with the result that his choices will correspond to the line drawings approximately 50 percent of the time. The nonconformist, on the other hand, will choose the pictures that do not match the line drawings.

Administration

The Starkweather Form Boards Test is administered to each child individually and requires two sessions with an interval of approximately one week between the two. During the first session, the child sees the line drawings pictured on slides A and C; and during the second session, he sees the line drawing pictured on slides B and D.

The first session begins with the Tree Form Board in which the slide-A line drawings have been placed. In giving directions to the child, the experimenter names the picture, comments about the holes in the form board, and tells the child that he can put pieces into the holes to finish the picture the way that he wants it. The child is then shown one pair of pictures, is told that they both fit into the same hole, and is directed to put in the one that he wants. For example, "Here is a tree. But look at the holes in the picture. I am going to let you fix the tree just the way you want it. See this hole? (E. points to the hole at the base of the tree, and then places the rabbit and the grass picture pieces directly in front of the child.) Both of these pieces will fit in here. You put in the

one you want." This procedure is repeated for each hole in the form board. As each pair of pictures is placed before the child, they MUST be placed in the left-right positions as indicated on the score sheet. This is true for both sessions with the form boards. An acceptable variation in the administration of the form boards test is to have the child indicate the hole that he wants to fill rather than having the experimenter make the choice. The order in which the form boards are presented and the order in which the holes are filled may vary; but the picture pieces MUST be placed before the child in the left-right positions indicated on the score sheet.

The four form boards with the slide-A drawings in place are presented to the child as described above. Then the boards with slide-C line drawings in place are presented in a similar manner. The children themselves enjoy helping with the changing of the slides.

Scoring

The scoring of the form boards test consists of a numerical count of the conforming and nonconforming responses made by the child. A D-score, or difference score, is figured by subtracting the number of nonconforming responses from the number of conforming responses. The possible range of D-scores is from -80 (complete nonconformity) to +80 (complete conformity).

Evaluation of the Form Boards Test

The validity of the form boards test was demonstrated by comparing the responses of children in an experimental group, to whom the form boards were administered as described above, with the responses of children in a control group, to whom the form boards were administered without the line drawings, i.e., without the opportunity to conform.

If the form boards provide a valid measure of the influence of the opportunity to conform, then the children in the experimental group should have larger D-scores than the children in the control group. Frequency of "conforming" and "nonconforming" responses demonstrated by the control group would be the result of chance; and therefore, the D-scores of this group should approximate zero. A Chi-square analysis of the frequency of high and low D-scores for the two groups indicated that the children in the experimental group were influenced by the opportunity to conform. (Chi-square = 32.203; $p < .001$).

If the form boards provide a valid measure of the opportunity to conform, the children in the experimental group should also show fewer picture preferences than the children in the control group, i.e., they should be less apt to choose the same picture piece both

times that it is presented. A Mann-Whitney U test analysis indicated that the children in the experimental group showed significantly fewer picture preferences than did the children in the control group. ($U = 11.5$; $p < .002$).

The reliability of the form boards test was demonstrated by a split-half analysis of the responses of the children in the experimental group. The correlation coefficient corrected by the Spearman-Brown formula, was +0.860 ($p < .01$).

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Revised: June 1971

Credit: The form board pictures are the work of Barbara A. Moffatt, artist and child development specialist. Miss Moffatt is with the Bureau of Child Development and Parent Education, State Department of Education, Albany, New York.

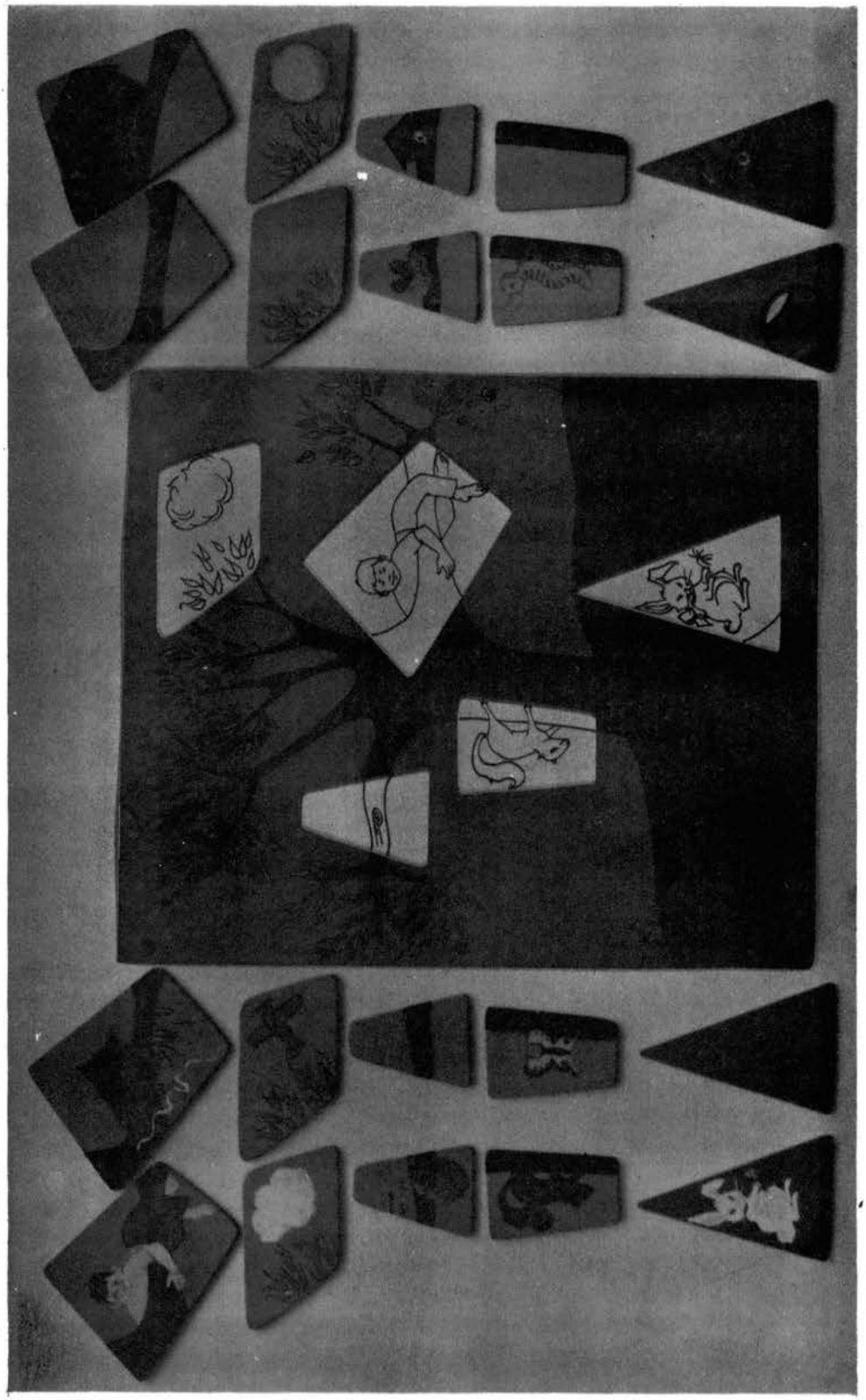

Figure 1. The Tree Form Board.

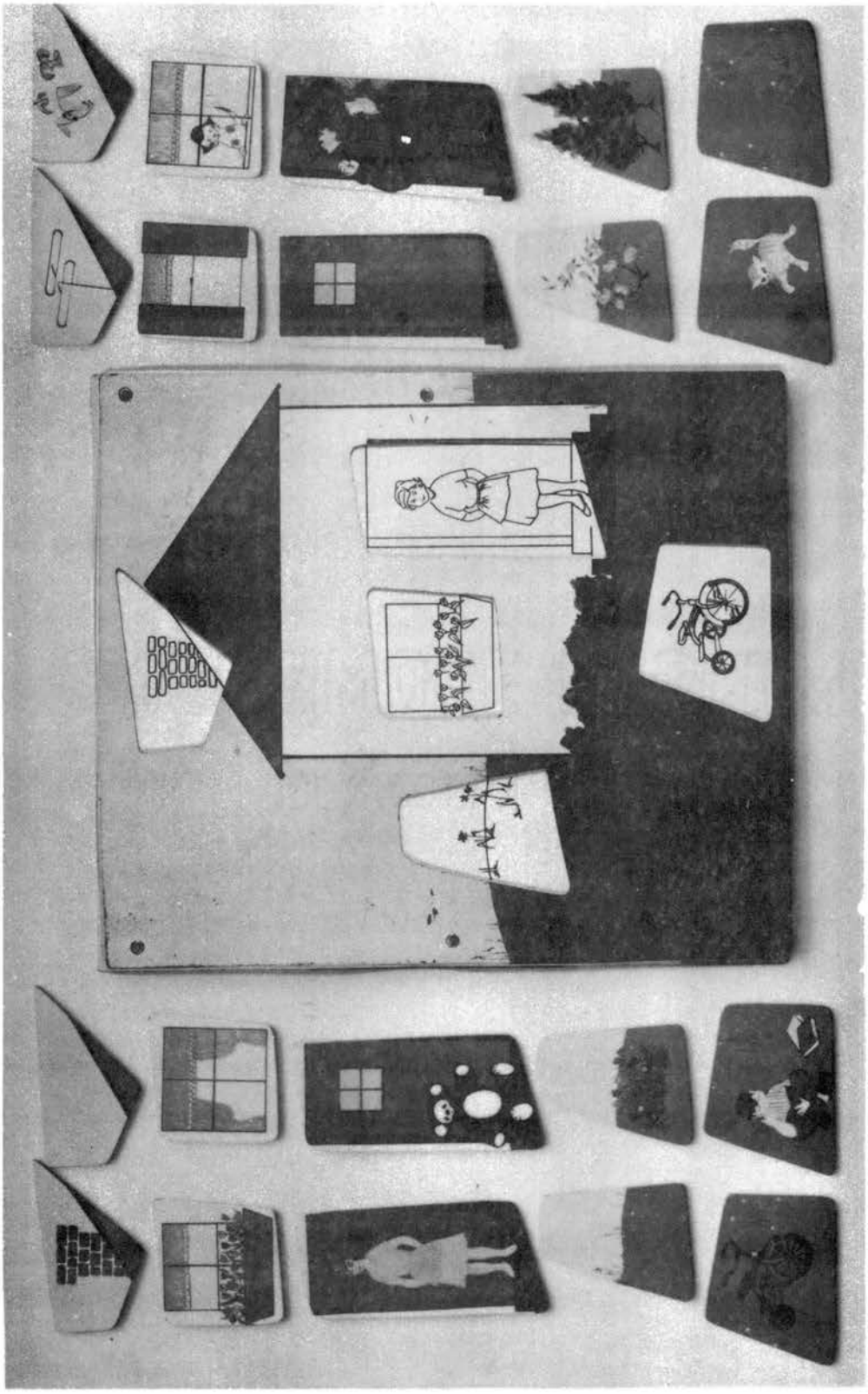

Figure 2. The House Form Board.

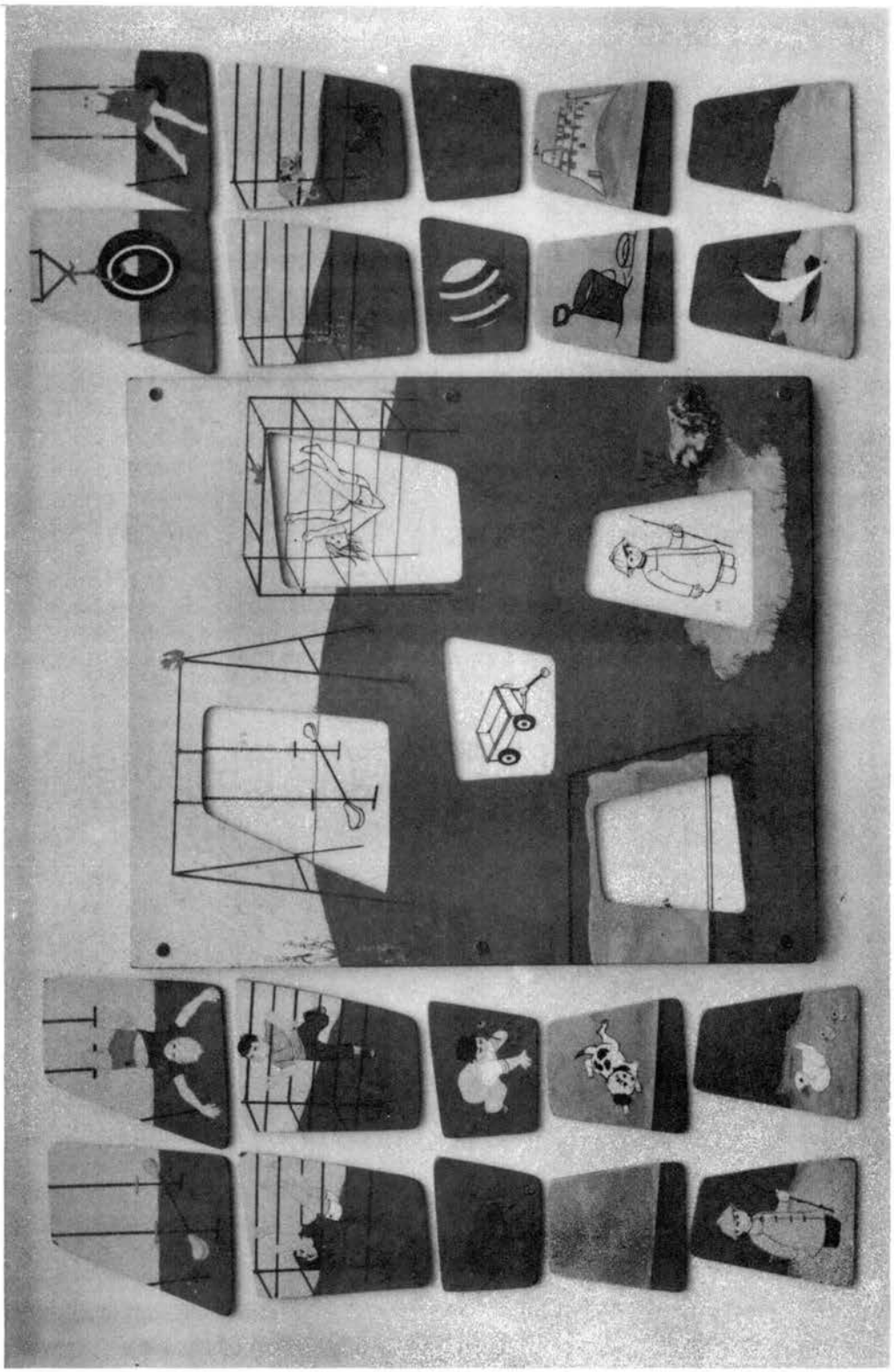

Figure 3. The Playground Form Board.

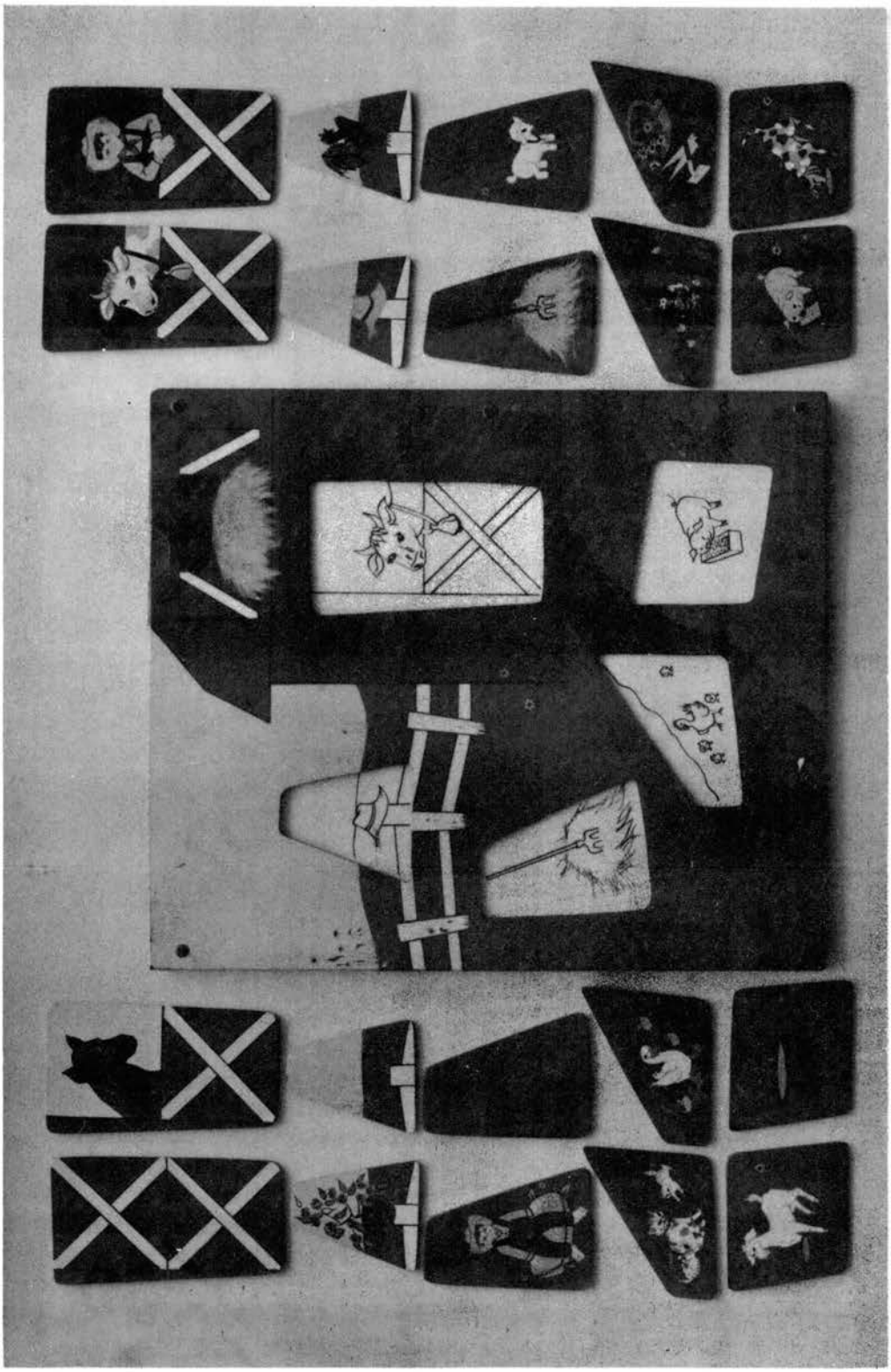

Figure 4. The Barnyard Form Board.

STARKWEATHER FORM BOARDS CONFORMITY TEST

FOR PRESCHOOL CHILDREN

Name Child F-1768 Sex F No. 1768

Birthdate 2-22-65 Age 5:1

Date 3-23-70 Place Kiddie Klub

Scores

Conform: 58

Nonconf: 22

D-Score: +36

FIRST SESSION (A) - B		SECOND SESSION A - (B)	
	TREE		
(Rabbit) - Grass		Rabbit - (Grass)	
Squirrel - (Butterfly)		Squirrel - (Butterfly)	
(Branch) - Bees		Branch - (Bees)	
(Boy) - Kite		Boy - (Kite)	
(Cloud) - Airplane		Cloud - (Airplane)	
	HOUSE		
Tricycle - (Boy)		(Tricycle) - Boy	
(Mother) - Teddy Bear		Mother - (Teddy Bear)	
(Flower Box) - Window		Flower Box - (Window)	
Grass - (Tulips)		Grass - (Tulips)	
(Chimney) - Roof		Chimney - (Roof)	
	PLAYGROUND		
(Boy Wading) - Ducks		Boy Wading - (Ducks)	
(Sand) - Dog		Sand - (Dog)	
(Wagon) - Baby		Wagon - (Baby)	
(Girl) - Boy		(Girl) - Boy	
(Glider) - Trapeze		(Glider) - Trapeze	
	BARNYARD		
(Goat) - Water Tub		(Goat) - Water Tub	
(Cat & Kittens) - Ducklings		(Cat & Kittens) - Ducklings	
(Boy) - Grass		Boy - (Grass)	
(Flower Pot) - Fence Post		Flower Pot - (Fence Post)	
Barn Door - (Horse)		Barn Door - (Horse)	

FIRST SESSION (C) - D		SECOND SESSION C - (D)	
	TREE		
(Ball) - Flowers		(Ball) - Flowers	
(Worm) - Tree Trunk		Worm - (Tree Trunk)	
(Bird Nest) - Bird House		(Bird Nest) - Bird House	
(Branch) - Tree House		Branch - (Tree House)	
(Sky) - Sun		Sky - (Sun)	
	HOUSE		
(Cat) - Grass		(Cat) - Grass	
(Door) - Mailman		(Door) - Mailman	
(Shutters) - Dog-window		Shutters - (Dog-window)	
(Roses) - Trees		Roses - (Trees)	
(TV Antenna) - Birds		(TV Antenna) - Birds	
	PLAYGROUND		
(Sailboat) - Water		(Sailboat) - Water	
(Pail) - Castle		Pail - (Castle)	
(Ball) - Grass		(Ball) - Grass	
Jungle Gym - (Dog & Cat)		Jungle Gym - (Dog & Cat)	
(Tire Swing) - Girl in Swing		(Tire Swing) - Girl in Swing	
	BARNYARD		
(Pig) - Dog		(Pig) - Dog	
(Hen & Chicks) - Garden Tools		Hen & Chicks - (Garden Tools)	
Hay - (Sheep)		(Hay) - Sheep	
(Hat) - Rooster		(Hat) - Rooster	
(Cow) - Farmer		Cow - (Farmer)	

APPENDIX D

STARKWEATHER TARGET GAME

FOR PRESCHOOL CHILDREN*

developed by
Elizabeth K. Starkweather

Oklahoma State University
Stillwater, Oklahoma

The Starkweather Target Game is designed to measure preschool children's willingness to try difficult tasks, and to measure this characteristic independent of ability. The game consists of a box-shaped target which responds somewhat like a jack-in-a-box. When a bull's eye at the front of the target is hit, the lid opens and a "surprise" picture appears. The picture can be removed; and when it has been seen by the child, it is replaced by another picture. Early exploratory work indicated that for preschool children, the target had to be one with a built-in surprise. Only when confronted with this type of target were the children motivated to play the game in a way which revealed their willingness to try difficult tasks.

The target game is appropriate for children ranging in age from approximately three to six years. It is not suitable for use with older children. Children in the first and second grades have an understanding of competition, and success in hitting the target is their goal. They do not need the motivation of the surprise pictures. Beyond this, the skill with which these older children play the game makes an adjustment for ability virtually impossible. Several second grade children, who were avid bowlers, were able to roll a curved ball and hit the target at 40 feet!

The Instrument

The Starkweather Target Game (Figures 1 and 2) consists of the following materials: the target; 21 surprise pictures; a 3-inch rubber ball; a cloth strip on which black lines at 2-foot intervals show the distances at which the target may be placed; and two small markers, one blue with the letter "E" painted on it and the other red with the letter "H" painted on it, which are used to indicate the target distances between which the child chooses as he plays the game.

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*This research was supported by the U.S. Office of Education, Cooperative Research Project #5-0333, and administered by the Research Foundation, Oklahoma State University.

Five levels of difficulty (target distances) are offered to each child. These are indicated by the cloth strip which is placed along the target range so that the nearest target distance is one, two, or three feet from the child depending upon his ability. The place where the child sits on the floor while playing the game is indicated by a large square marked with masking tape. (Young children who could not understand that they were to remain behind a line when rolling the ball to the target, were able to understand that they must remain in the square while playing the game.)

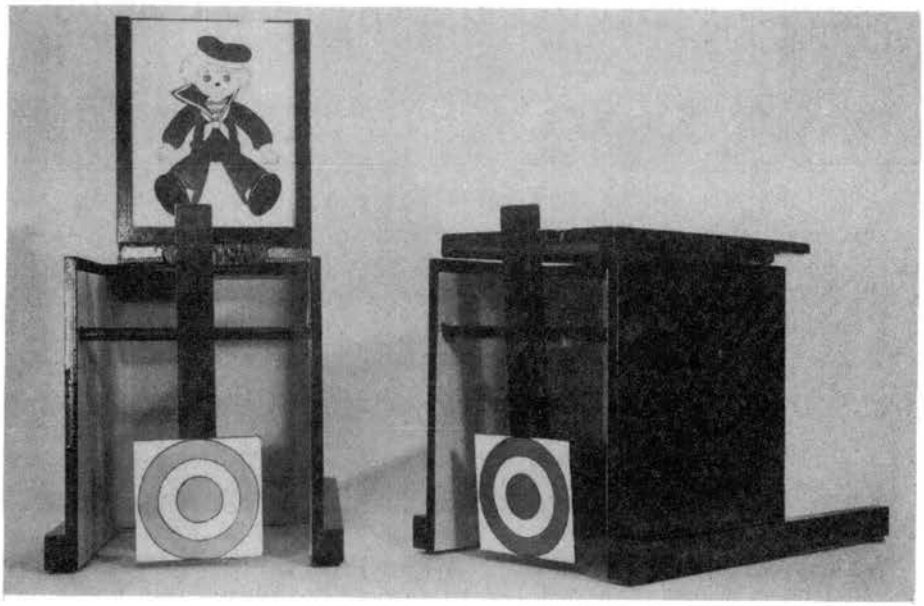

Figure 1. The target, open and closed.

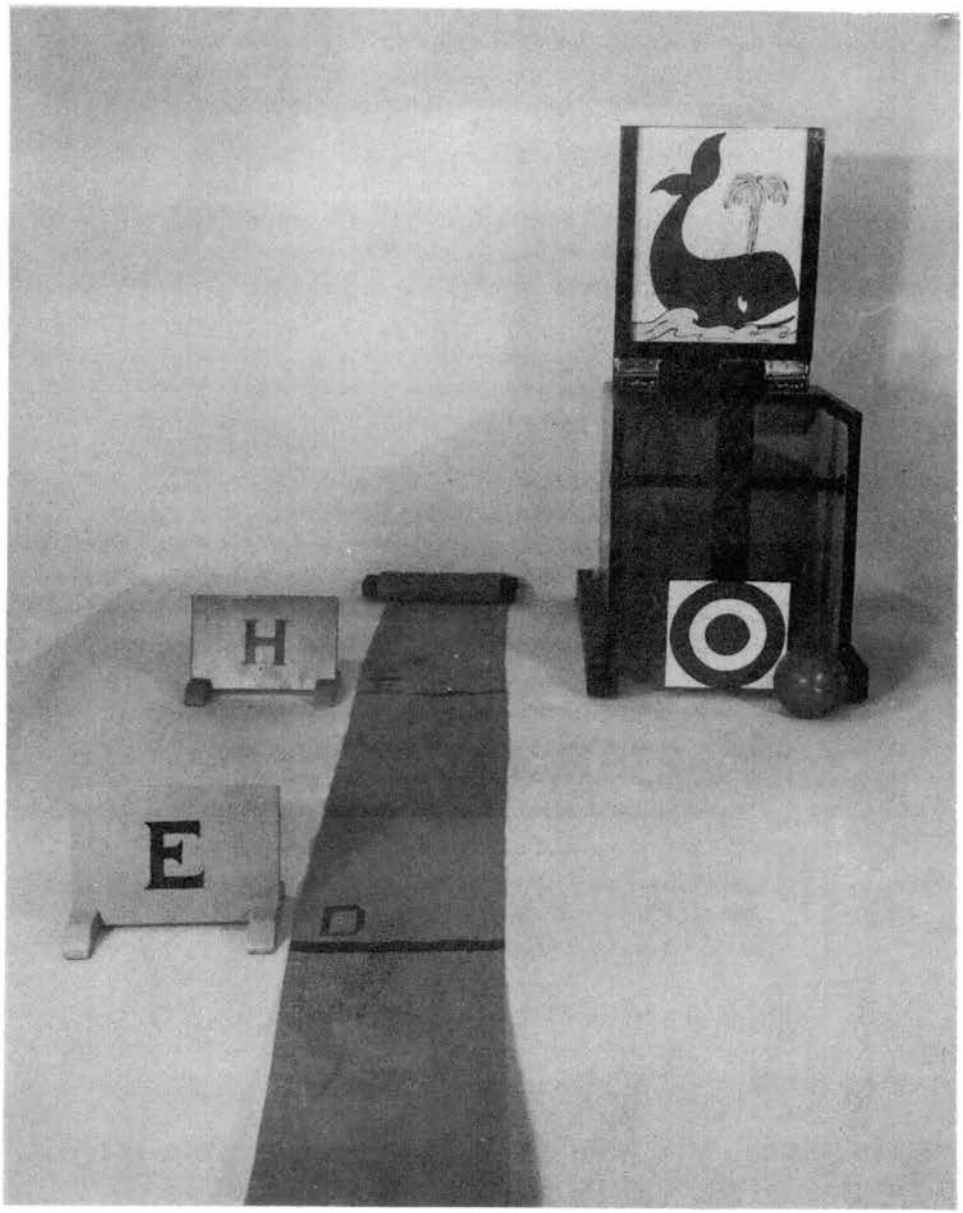

Figure 2. Materials used in the target game.

Pretest

The ability of each child is determined in a pretest, and the difficulty of the game is then adjusted so that the mid-point in the target range is a distance at which the child has approximately a 50 percent chance of success. In the pretest, the child rolls the ball twice to each of five target distances: 1-foot, 3-feet, 5-feet, 7-feet, and 9-feet. The number of successes obtained in the pretest determines the child's ability group and dictates the target distances which will be used for him in the actual game.

Ability Group	Successes in Pretest	Target Distances in feet
I : High	6 or more	3 - 5 - 7 - 9 - 11
II : Medium	4 or 5	2 - 4 - 6 - 8 - 10
III : Low	2 or 3	1 - 3 - 5 - 7 - 9

Administration

During the game, the child shows his willingness to try difficult tasks as he chooses between relatively easy and relatively difficult distances for the target. As the game begins, the child is seated in the square marked on the floor, and the cloth strip along the target range is moved, if necessary, so that the nearest target distance is the recommended distance for the child's ability group. The experimenter then places the two markers at target distances A and B, which are the two nearest the child. Then, holding the target off the floor, she asks the child to choose where the target should be placed. "This is the easy place (indicating the E-marker) and this is the hard place (indicating the H-marker). Where shall I put the box (target)--at the easy place or at the hard place?" (The easy and the hard are always presented in this order.) The target is then placed at the distance selected by the child and he is given two chances to hit it. The experimenter always accepts the child's choice of the easy or the hard and then comments in a simple and direct manner about his success or failure. "Good, you hit it," or "Oh, you missed. Try again." If the child misses on both attempts to hit the target, the experimenter indicates in her comment that the child will again choose between target distances. "Now you can choose again. This is the easy place and this is the hard place. Where shall I put the box -- at the easy place or at the hard place?"

During the game, the child makes a total of 20 choices between the easy and the hard. Each target distance is paired with every other target distance in the manner of a paired-comparisons test. The order of presentation is planned so that no one level of difficulty appears

in two successive pairs, and also is planned so that the child becomes familiar with the game by starting with the easier target distances. The order of presentation is shown on the score sheet. "A" represents the easiest level of difficulty or the nearest target distance, and "E" represents the hardest level of difficulty or the farthest target distance.

Each child's performance is recorded in terms of the target distances he chooses (A or B, C or D, etc), the number of balls he uses (1 or 2), and whether or not he succeeds in hitting the target (0 or 1). The performance of Child F-595 is illustrated on the score sheet. She first chose the nearest target distance (A), and she succeeded in hitting the target on her first try. She then chose the farther distance (B). She succeeded in hitting the target, but she used two balls in the process.

Scoring

The scoring of the target game takes into consideration the skill with which the child actually plays the game, and thus, provides an additional adjustment for ability. The score (B+D-S) is calculated from the number of balls the child uses (B) and the number of times he chooses the difficult (D) in relation to the number of successes (S) he experiences while playing the game.

Target game data and derived scores for several children are presented in Table I. The logic of the scoring method can be seen when these data are compared. For example, Child M-670 and Child F-598 chose the difficult target the same number of times (8) and succeeded in hitting the target the same number of times (15); but a difference in the ability of the two children is indicated by the number of balls used by each in obtaining these successes. Child M-670, whose score for the target game was 24, used more balls and demonstrated greater willingness to try the difficult than did Child F-598, whose score for the game was 20.

The final adjustment for ability, which is provided by the scoring of the target game, gives added strength to the game as an instrument which can be used to measure young children's willingness to try difficult tasks.

Evaluation of the Target Game

The target game is adjusted for the ability of each child on the basis of a pretest. This adjustment has been re-evaluated in terms of the skill demonstrated during the game by a group of 52 children. An ability score, the distance in feet at which each child actually had a 50 percent chance of success, was calculated; and a comparison of these scores, using the Kruskal-Wallis one-way analysis of variance, indicated

TABLE I

TARGET GAME DATA AND DERIVED SCORES

Child	Number of Balls	Number of Difficult	Number of Successes	Score B+D-S
M-670	31	08	15	24
F-598	27	08	15	20
M-708	27	13	16	24
F-679	27	04	16	15
F-595	30	06	13	23
F-064	30	06	17	19

that the abilities of the children in the three groups were significantly different. Median ability scores were 5.96' for Group I, 4.40' for Group II, and 3.76' for Group III. ($H = 11.675$; $p < .01$). When the children's abilities were expressed in terms of the target range, rather than in feet, the scores for the three groups were approximately the same, indicating that a reliable adjustment for ability had been made. The median adjusted ability score for each of the three groups placed the point of 50 percent success between the second and third target distances. The median adjusted ability scores were 2.48 for Group I, 2.20 for Group II, and 2.38 for Group III. ($H = 0.983$; n.s.).

The target game was developed as an instrument which could be used to measure preschool children's willingness to try difficult tasks, and to measure this characteristic independent of ability. Statistical evidence that the target game met this criterion was obtained by correlating the children's target game scores (B+D-S) with their ability scores (the distance in feet at which they had a 50 percent chance of success). A Spearman rank order correlation coefficient of +0.115 (n.s.) indicated that the target game successfully measured the children's willingness to try difficult tasks independent of their ability.

The internal consistency of the target game was demonstrated by means of a split-half correlation (Spearman-Brown formula). A coefficient of +0.876 ($p < .01$) indicated that the instrument was reliable.

Further analysis indicated sex and age differences in the expected direction. Boys were more skillful than girls, (Mann-Whitney $U = 245$; $p < .05$); and older children were more skillful than younger children, (Kruskal-Wallis analysis of variance, $H = 9.315$; $p < .01$).

Unpublished manuscript
Revised: June 1971

STARKWEATHER TARGET GAME

FOR PRESCHOOL CHILDREN

Name Child F-595 Sex F Number 595

Date 4-3-65 Birthdate 2-23-61 Age 4:1

Testing Place Stillwater

SCORE: B+D-S
23

	# Balls	Success		# Balls	Success
1. (A) - B	1	1	6. (A) - C	1	1
A - (B)	2	1	(A) - C	1	1
2. (C) - D	2	0	7. B - (E)	2	1
(C) - D	1	1	(B) - E	2	0
3. A - (E)	2	0	8. (A) - D	1	1
(A) - E	1	1	(A) - D	1	1
4. B - (C)	2	1	9. (C) - E	1	1
(B) - C	1	1	C - (E)	2	0
5. D - (E)	2	0	10. (B) - D	2	0
(D) - E	2	0	(B) - D	1	1

Pretest: 4

Group: II

Balls: 30

Difficult: 6

Successes: 13

APPENDIX E

STARKWEATHER MASCULINITY-FEMININITY TEST

FOR PRESCHOOL CHILDREN*

developed by
Elizabeth K. Starkweather

Oklahoma State University
Stillwater, Oklahoma

The Starkweather Masculinity-Femininity Test (M-F Test) measures the masculine and feminine preferences of preschool children. The test is designed so that the evaluation of what is masculine and what is feminine is based on the actual choices of the children being tested. The assumption underlying this design is that the behavior of boys is boy-behavior (masculine) and the behavior of girls is girl-behavior (feminine).

The materials for the M-F Test include a picture booklet of 20 to 24 pages and individually mounted pictures, identical to those used in the test booklet. The pages in the test booklet are of colored hi-gloss paper approximately 3" x 8" in size. Hi-gloss paper comes in a variety of colors and no color needs to be used for more than two pages in the test booklet. On each page there are three pictures (gummed seals) which are arbitrarily selected as masculine, feminine, and neutral. This placement of masculine and feminine pictures on each page is done for the purpose of maximizing the power of the test to discriminate between the preferences of boys and girls. The pictures themselves are commercially produced gummed seals and are selected to include a variety of objects such as animals, cars, babies, flowers, cowboys, and Mother Goose figures. The individually mounted pictures are placed on small pieces of hi-gloss paper, approximately 2" x 3", which are the same color as the test booklet pages on which the pictures appear.

Administration

Each child is introduced to the M-F Test by being told that he is going to make a picture booklet of his very own. He is then shown the first page of the test booklet and is asked, "Which one of these pictures do you want?" The child makes his selection and is then given an identical picture, one of the individually mounted pictures, as

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*The Starkweather M-F Test was developed as part of a creativity research program supported by the Research Foundation at Oklahoma State University.

the first page of his own picture book. This procedure is repeated until the child has chosen one picture from each page in the test booklet.

Scoring

Each picture in the M-F Test booklet is assigned a score, a masculine or feminine value, which is determined by the specific choices of all the children in the study. For example, a picture chosen by a majority of the boys and by few of the girls is weighted heavily as masculine. The M-F score for an individual child is then figured by adding the masculine and feminine values of all the pictures he has chosen. This method of scoring provides a measure of masculinity-femininity which is based on the actual choices of the children themselves rather than being based on the judgments of adults.

The method of calculating the masculine and feminine values of individual pictures is illustrated in Figures 1 and 2. The page shown in Figure 1 is from an M-F Test booklet used in several studies in which an equal number of boys and girls participated. When this is true, the score values assigned to the pictures are figured by subtracting the number of girls from the number of boys who chose each picture. In the 1968 DKM Study, the colt, chosen by 63 boys and 23 girls was assigned a masculine value of +40; and the baby, chosen by 15 boys and 46 girls, was assigned a feminine value of -31. These assigned values were only for use in scoring the M-F Tests of the children who participated in that study. In the 1969 KGM Study, the assigned numerical values for these same pictures were smaller because fewer children participated in that study; nevertheless, the relative values remained the same. The colt was masculine (+20) and the baby was feminine (-17).

When an unequal number of boys and girls participate in a study, weighting is necessary in calculating the values to be assigned to the individual pictures. In Figure 2, a page from the M-F Test booklet used in the 1967 SKW Study is illustrated. In this study there were 17 boys and 15 girls. Weighting to correct for this inequality was achieved by multiplying the number of girls who chose each picture by 1.133; n.b., $17 \div 15$ equals 1.133. The weighted scores thus obtained for the girls were then subtracted from the scores for the boys. In Figure 2, the picture of the baby was chosen by three of the 17 boys and was chosen by seven of the 15 girls. When the girls' score was weighted, i.e., multiplied by 1.133, it became 7.93, and the assigned value for the picture of the baby was then -4.93.

The M-F Test score sheet, on page 96, illustrates the recording of picture choices and the way in which a child's score is figured from the assigned values of the pictures he chose.

Evaluation of the M-F Test

The reliability of the Starkweather M-F Test was determined by a split-half correlation, using the Spearman-Brown modified formula. Each child's responses to the odd items and the even items on the test provided the two scores necessary for this analysis. A coefficient of +0.936, significant beyond the .001 level, indicated that the M-F Test was highly reliable, i.e., had internal consistency.

The Starkweather M-F Test was designed to discriminate between the picture preferences of boys and girls, and it does achieve this purpose for which it was designed. A Mann-Whitney U test analysis of the scores of 32 preschool children indicated that the boys and girls had significantly different picture preferences. ($U = 1.00$; $p < .002$). The M-F Test was accepted as having face validity.

A unique quality of the Starkweather M-F Test is that the bias of adult judgments is avoided in the scoring, an achievement which has not been possible when researchers have used other measuring devices. For the most part, where young children are concerned, masculinity and femininity are judged on the basis of behavior and appearance. For example, adults judge a girl to be a tomboy if her preferred activities, games, toys, playmates, and clothing are more "appropriate" for boys than for girls. The rather common acceptance of judgments such as this suggested the possibility of designing a validation test which would measure masculinity and femininity as culturally defined. The validity of the M-F Test would be assured if the test scores, free of adult bias, were in agreement with the cultural expectations for young boys and girls.

A validation booklet was constructed similar in design to the M-F Test booklet. It consisted of 15 pages of clothing and 15 pages of toys and activities. Each page contained three pictures which were arbitrarily chosen as masculine, feminine, and neutral. The booklet was shown to 20 middle-class adults (10 men and 10 women) who were asked to indicate the most masculine and the most feminine picture on each page. For example, on one page the three pictures were boys' pajamas, girls' pajamas, and a nightgown. Without exception, the adults chose the boys' pajamas as the most masculine and the nightgown as the most feminine.

The validation booklet was then shown to 20 middle-class children (10 boys and 10 girls). Each child was asked to play a game of "Let's pretend" during which the experimenter told a story as the child made his choices. For example, as the child looked at a page showing three types of outdoor clothing, the experimenter said, "Let's pretend it is time to go out to play. What would you like to wear outside?" Then as he looked at the next page which showed three different toys, the experimenter said, "Let's pretend you are now outside and these toys are in the yard. Which one would you like to play with today?"

The method of scoring the validation test was the same as the method of scoring the M-F Test. Assigned scores for each picture in the validation booklet were figured for the adults and for the children. The adults agreed unanimously on the masculinity and femininity of the majority of the pictures, but the children showed greater flexibility in their choices. Nevertheless, there was extremely high agreement between the two sets of assigned scores. There were 90 individual pictures in the validation booklet, and the adults and children agreed on the masculine, feminine, or neutral rating of 86 of these.

In order to answer the question of whether the M-F Test actually measured masculinity and femininity, the children's scores derived from their choices of pictures in the validation booklet, which were in agreement with cultural expectations, were compared to their M-F Test scores. The children's scores on the validation test ranged from -192 to +198, indicating a range from high feminine to high masculine preferences. (The maximum possible range was from -207 to +208.) The scores for these same children on the M-F Test ranged from -58 to +48, again indicating a range from high feminine to high masculine preferences. (The maximum possible range for these scores was from -73 to +67.)

The two sets of scores for the 20 children who participated in the validation study were compared in order to determine whether the M-F Test, which is completely free of adult bias, actually does measure masculinity and femininity. A Spearman rank order correlation was used in the analysis of the relationship between these two sets of scores. The correlation coefficient was +0.914, significant beyond the .01 level. In view of these results, the Starkweather M-F Test for preschool children is accepted as a valid measure of masculinity and femininity.

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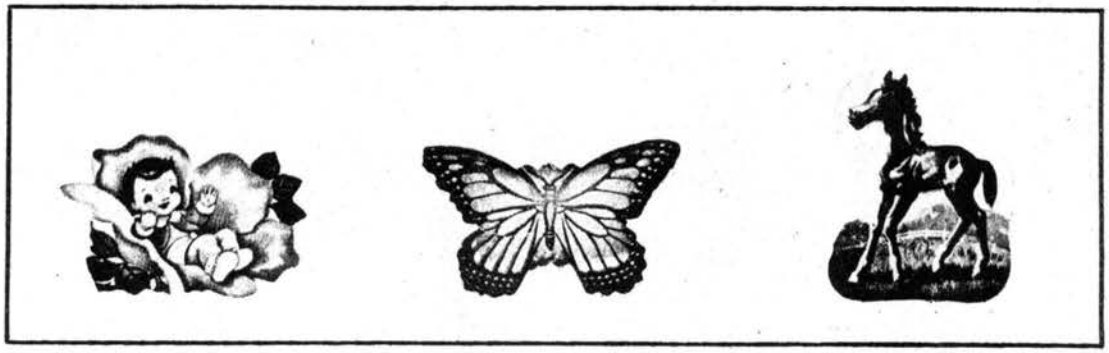
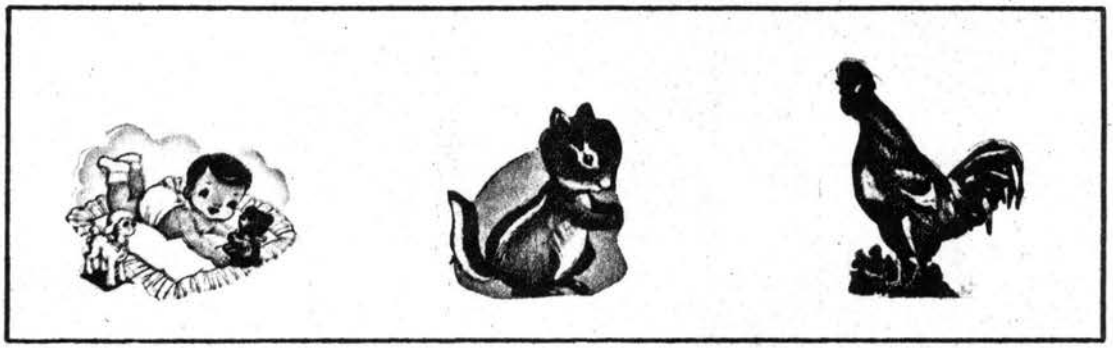
Revised: June 1971



1968 DKM Study	Baby	Butterfly	Colt
Boys (N=90)	15	12	63
Girls (N=90)	46	21	23
Assigned Value	-31	-09	+40

1969 KGM Study	Baby	Butterfly	Colt
Boys (N=48)	04	09	35
Girls (N=48)	21	12	15
Assigned Value	-17	-03	+20

Figure 1. Method of calculating the masculine and feminine values for individual pictures in the Starkweather M-F Test.



1967 SKW Study	Baby	Chipmunk	Rooster
Boys (N=17)	3.00	9.00	5.00
Girls (N=15)	7.00	3.00	5.00
Girls (weighted)	7.93	3.40	5.67
Assigned Value	-4.93	+5.60	-0.67

Figure 2. Method of calculating the masculine and feminine values for individual pictures in the Starkweather M-F Test when weighting of scores is necessary.

STARKWEATHER MASCULINITY-FEMININITY TEST
FOR PRESCHOOL CHILDREN

Name Child M-1372 Sex M Number 1372

Date 1-4-68 Birthdate 9-24-63 Age 4:3

Testing Place Stillwater

	Pictures			Score		Pictures			Score
1.			✓	+03	13.	✓			+14
2.	✓			-04	14.	✓			-05
3.			✓	-16	15.	✓			-12
4.			✓	-14	16.		✓		+13
5.	✓			+05	17.	✓			00
6.		✓		+01	18.	✓			-16
7.	✓			+03	19.	✓			+04
8.	✓			00	20.		✓		+07
9.	✓			-05	21.		✓		+20
10.	✓			+17	22.	✓			+40
11.		✓		-15	23.	✓			+15
12.			✓	+02	24.	✓			-14

TOTAL +43

APPENDIX F

STARKWEATHER SOCIAL RELATIONS TEST

FOR PRESCHOOL CHILDREN*

developed by
Elizabeth K. Starkweather

Oklahoma State University
Stillwater, Oklahoma

The Starkweather Social Relations Test is designed to measure a young child's social value within his own peer group. It is more than a test of popularity. It combines a picture interview technique with gift-giving, and each child's value in his group is measured in terms of the extent to which his gift-giving is reciprocated by the children whom he chooses. The assumption underlying the choice of gift-giving as a technique for measuring social relations is that an individual wants to benefit someone he likes.

The Instrument

The materials needed for the social relations test include the following:

(1) A composite picture of the children in the group. A picture is needed to help each child remember the other children in his group and to permit him to indicate each choice by pointing to a picture or by naming a child. Individual pictures of the children can be mounted on heavy mat board or, as is necessary with large groups, a composite picture can be constructed from pictures taken of a few children at a time. An example of a composite picture, constructed from polaroid prints, is presented in Figure 1.

(2) Inexpensive toys, such as small plastic cars, marbles, balloons, and pictures. These toys are the gifts which are given to the chosen children. The number of toys needed depends upon the number of children participating in the study. Sixteen gifts are needed for each child -- four each of four different gifts. Gift-giving as the technique for measuring social relations among young children is of particular value because the child makes his choice of other children in terms of specific criteria (the gifts) which he can understand,

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*The Starkweather Social Relations Test was developed as a part of the creativity research supported by the Research Foundation, Oklahoma State University.

Figure 1. Composite picture of a group of preschool children.

and the actual giving of a gift, as a consequence of the child's naming another child, emphasizes the importance of his choice and thereby increases the probability of the test results being valid.

(3) Envelopes, pre-labelled with the names of the children in the group. In order to insure the privacy of the children's choices of other children, a method of distributing the gifts without identifying the giver is essential. One method that has been most successful has been that of having the child, as he makes his choices, help to place the gifts in pre-labelled envelopes designated as belonging to the children he has chosen. Attractive and interesting envelopes can be easily made from the pages of a wallpaper sample book, preferably a sample book for wallpaper that is clothbacked.

Administration

First, the composite picture of the children in the peer group is shown to the child, and he is encouraged to name all the children, pointing to each one as he does so. "Here is a picture of children you know. Can you find your picture? (Pause) Tell me who the other children are."

The child is then given his choice of several possible gifts, with the understanding that the one he chooses is his to keep. For example, he may choose one of several small plastic toys, such as animals or cars. Three gifts, identical to the one chosen by the child for himself, are then placed on the table before him. "These (cars) are for your friends." The experimenter then touches the toys (cars) one at a time and asks the child to whom he wants each one to be given. As the child makes his choices, he puts each gift in the pre-labelled envelope designated as belonging to the child he has chosen. This procedure of gift-giving is repeated until the child has chosen friends for four different gifts, making a total of 12 choices.

Scoring

The scoring of the social relations test is designed to show the relationship between the child's choice of other children and their choice of him. For example, Child F-1316, as shown in Table I, was chosen by five of the seven children whom she chose. In calculating her social relation (S.R.) score, her relationship to each of the seven children is expressed as a weighted score to show the return that she received on her investment; and then the sum of these weighted scores is divided by seven, i.e., is divided by the total number of children chosen by her. These calculations can be illustrated as follows:

$$\frac{0/2 + 1/1 + 1/1 + 1/3 + 2/1 + 2/3 + 0/1}{7} =$$

$$\frac{0.00 + 1.00 + 1.00 + 0.33 + 2.00 + 0.67 + 0.00}{7} = \frac{5.00}{7} = 0.71$$

In Table I, the scores of three children are presented for the purpose of illustrating the meaning of the social relations score. The first child, F-1316, chose seven of the other children; and in turn, five of them chose her. She chose these children a total of 12 times, but she was chosen by them only nine times and did not receive a complete return on her investment in them. Her score was 0.71. The second child, M-1337, was a child who liked everybody and was very popular. He spread himself in his gift-giving and was frequently chosen by other children. His score of 1.25 shows that he received a large return on his investment in the other children. The third child, M-1318, chose seven of the others, but only two of them chose him. His score of 0.12 shows clearly that he received little return on his investment in the other children.

TABLE I

STARKWEATHER SOCIAL RELATIONS TEST: EXAMPLES OF DATA FOR THE CALCULATION OF S.R. SCORES

	Other Children								
	A	B	C	D	E	F	G	H	S.R. Score
F-1316 is chosen	0	1	1	1	2	2	0	2	
F-1316 chooses	2	1	1	3	1	3	1	0	0.71
M-1337 is chosen	1	4	2	2	1	1	1	1	
M-1337 chooses	1	1	2	2	1	2	2	1	1.25
M-1318 is chosen	0	0	1	1	0	0	0	0	
M-1318 chooses	1	1	2	3	1	2	2	0	0.12

Possible scores on the social relations test range from 0.00 to 4.00. A score of 0.00, which is not uncommon, would be earned by a child who received no return on his investment in other children; i.e., no child to whom he gave a gift would have chosen him in return. A score of 4.00, which is highly improbable, would be earned by a child who received a maximum return on his investment in other children; i.e., he would have given gifts to 12 different children and each would have chosen him four times in return. Thus far, in the testing of several hundred children, the highest score has been 1.89, which was earned by a child who considered everyone his friend and who, in return, was considered a very special friend by almost everyone in his peer group.

Unpublished manuscript
June 1971

APPENDIX G

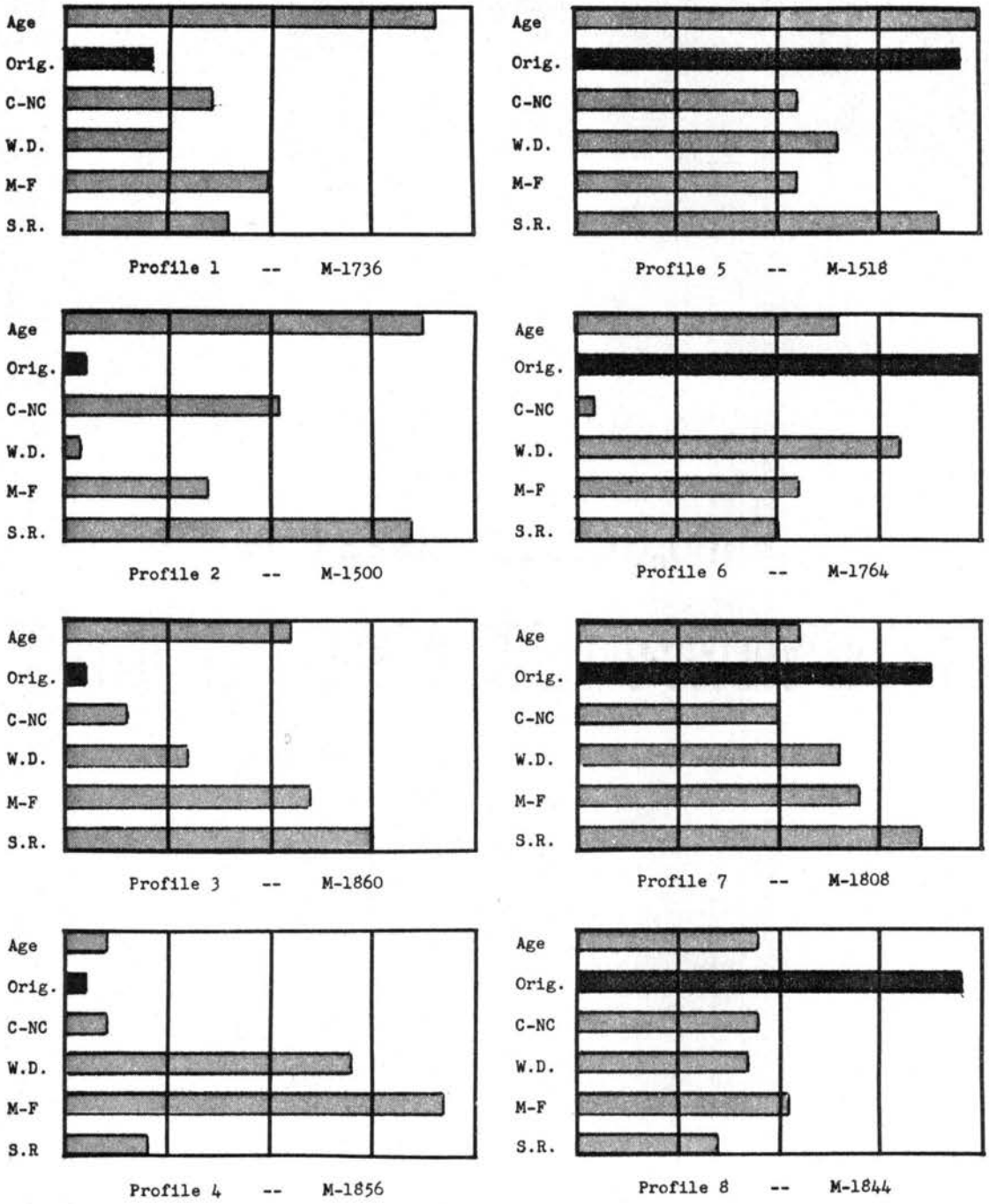

Figure 1. Creativity profiles of boys scoring high and low in originality.

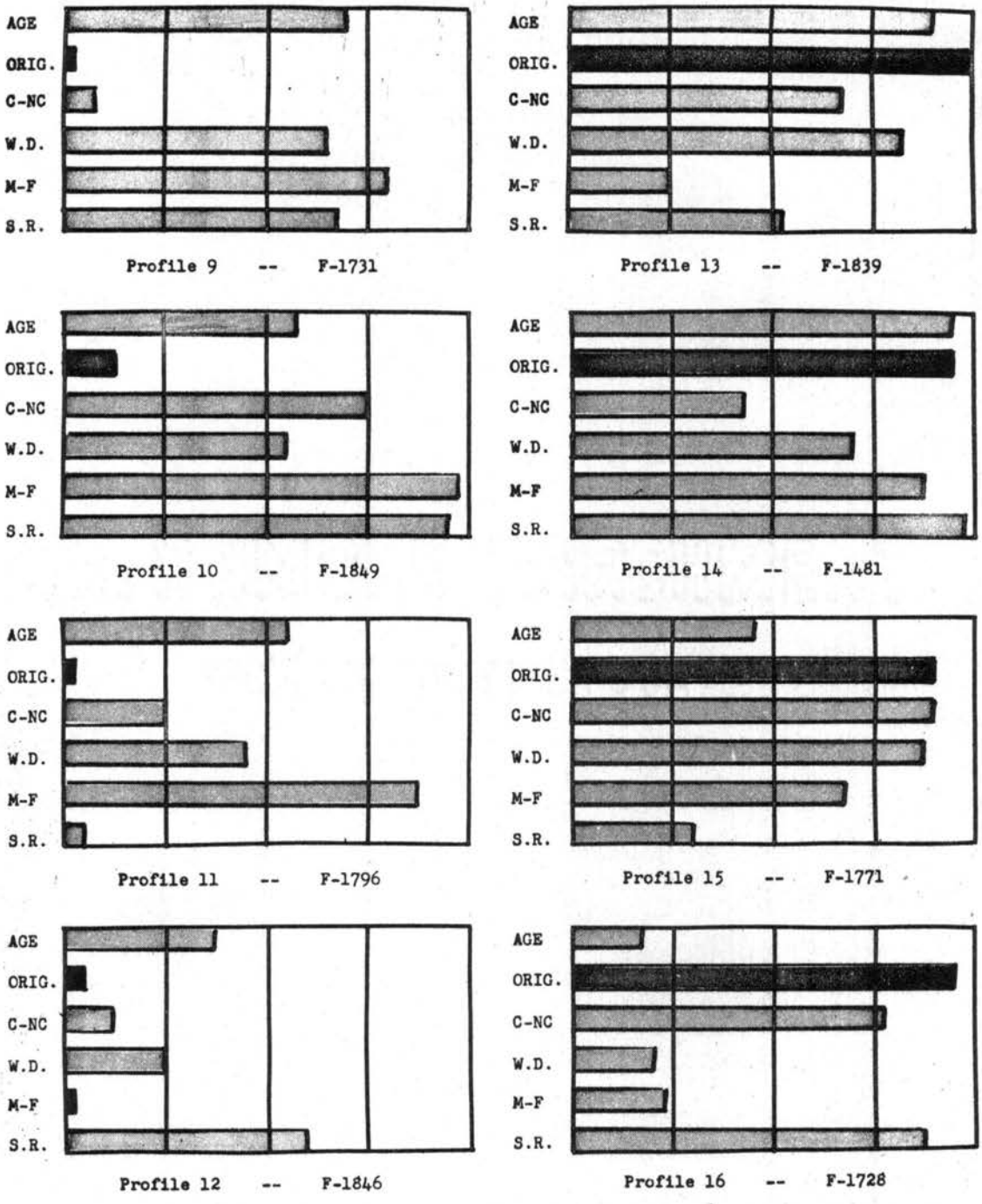

Figure 2. Creativity profiles of girls scoring high and low in originality.

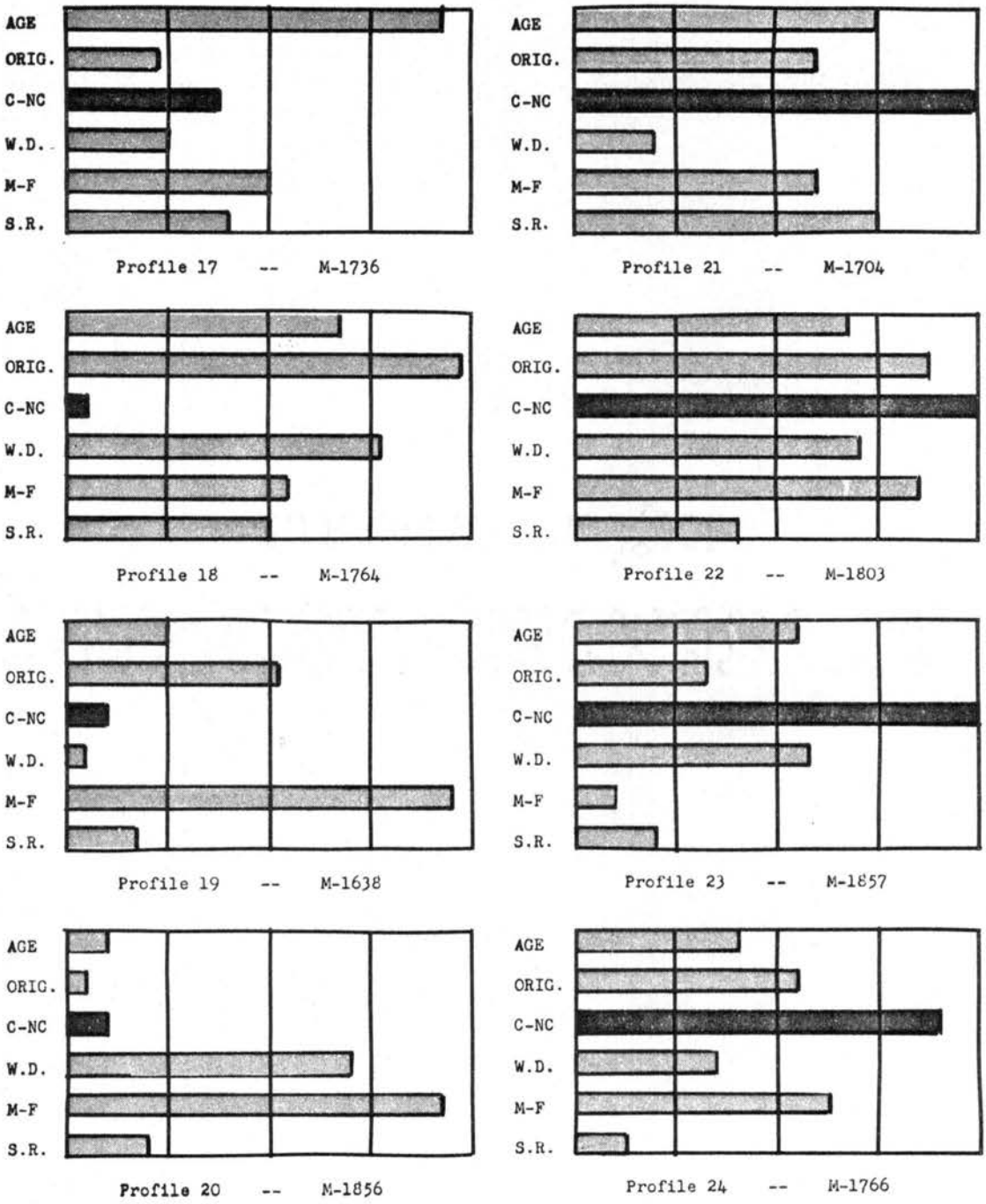

Figure 3. Creativity profiles of boys scoring high and low on the form boards test which measures freedom to use conforming and nonconforming behavior (C-NC).

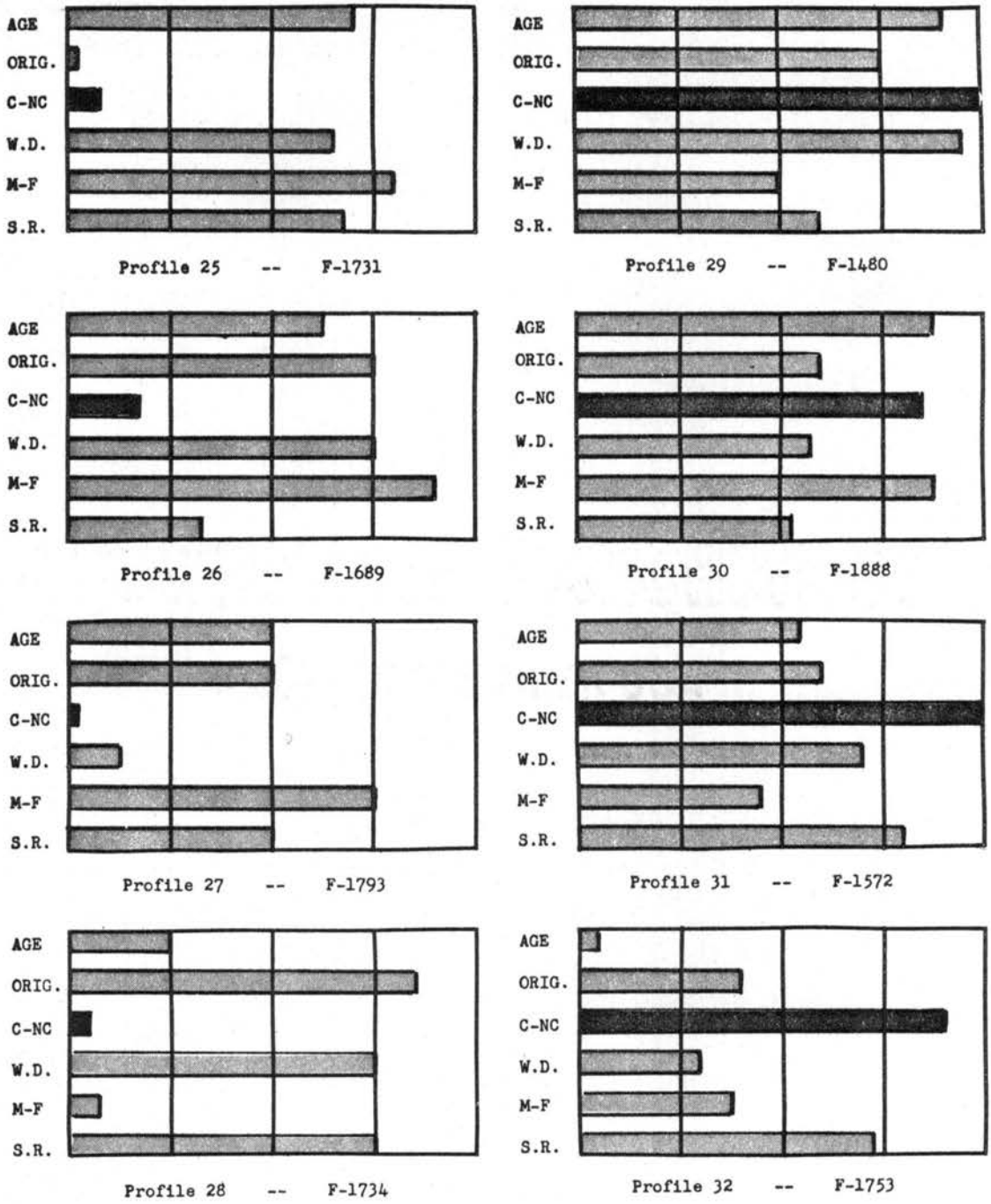

Figure 4. Creativity profiles of girls scoring high and low on the form boards test which measures freedom to use conforming and nonconforming behavior (C-NC).

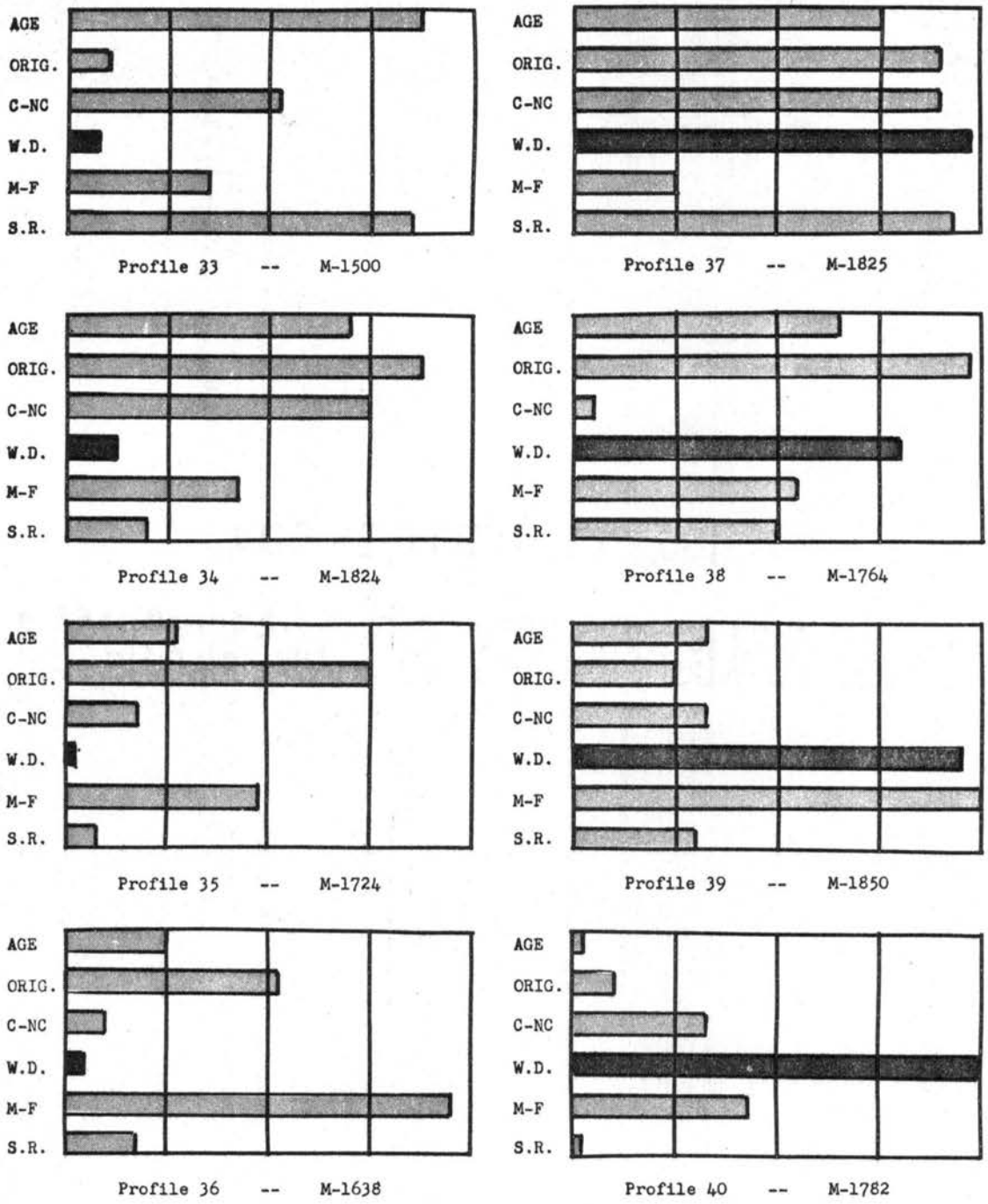

Figure 5. Creativity profiles of boys scoring high and low in the target game which measures willingness to try the difficult (W.D.).

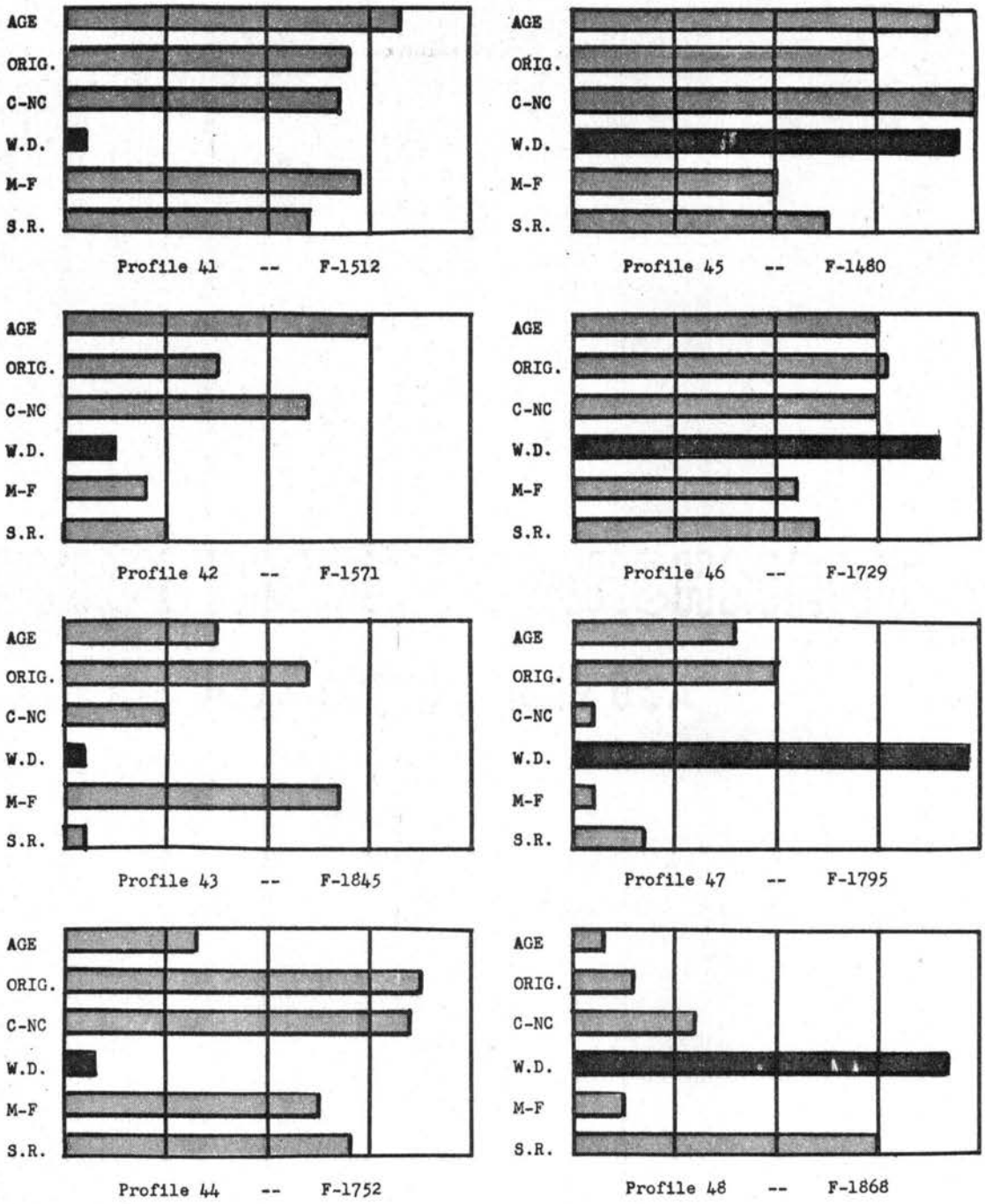

Figure 6. Creativity profiles of girls scoring high and low in the target game which measures willingness to try the difficult (W.D.).

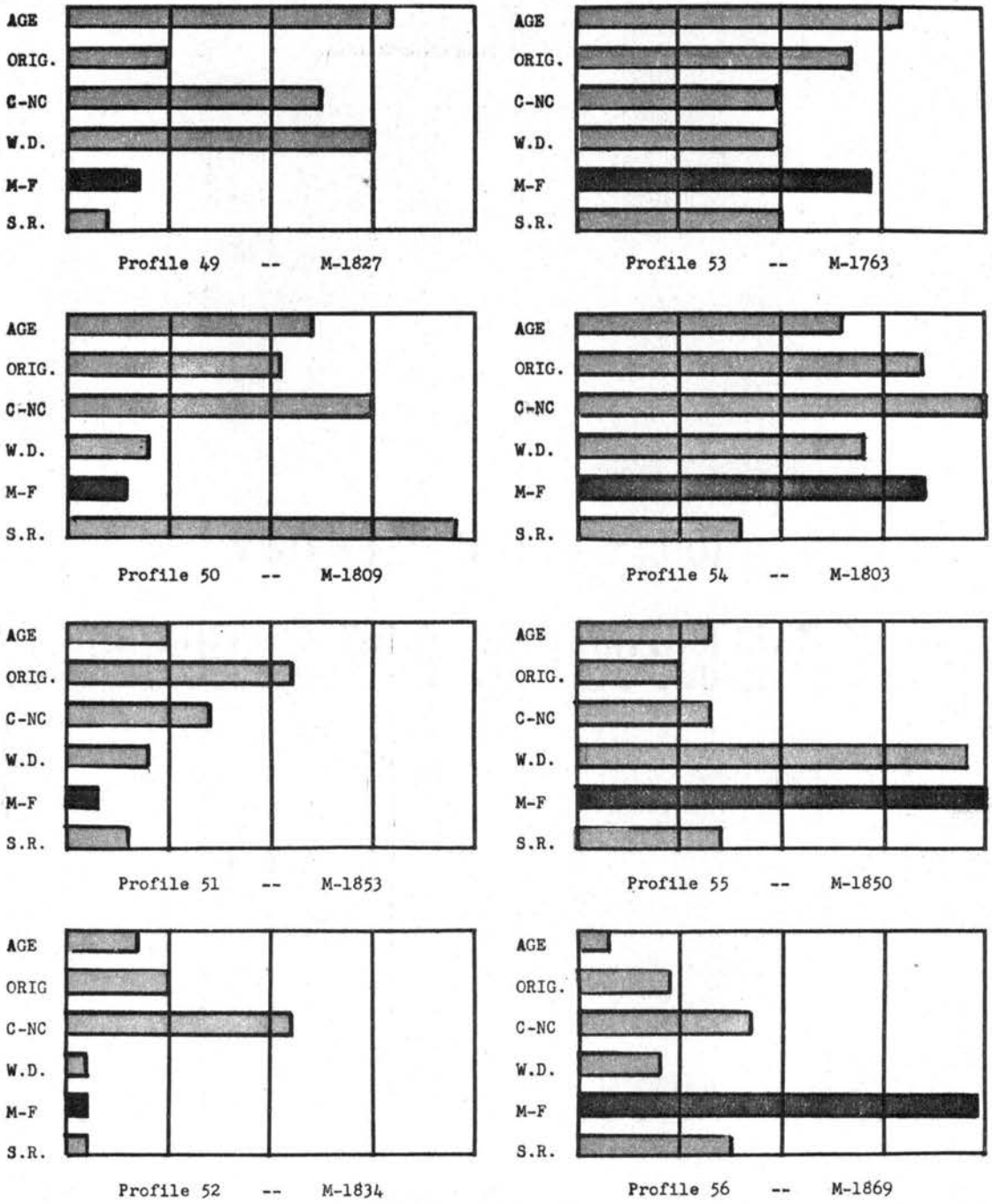

Figure 7. Creativity profiles of boys scoring high and low in masculinity (M-F).

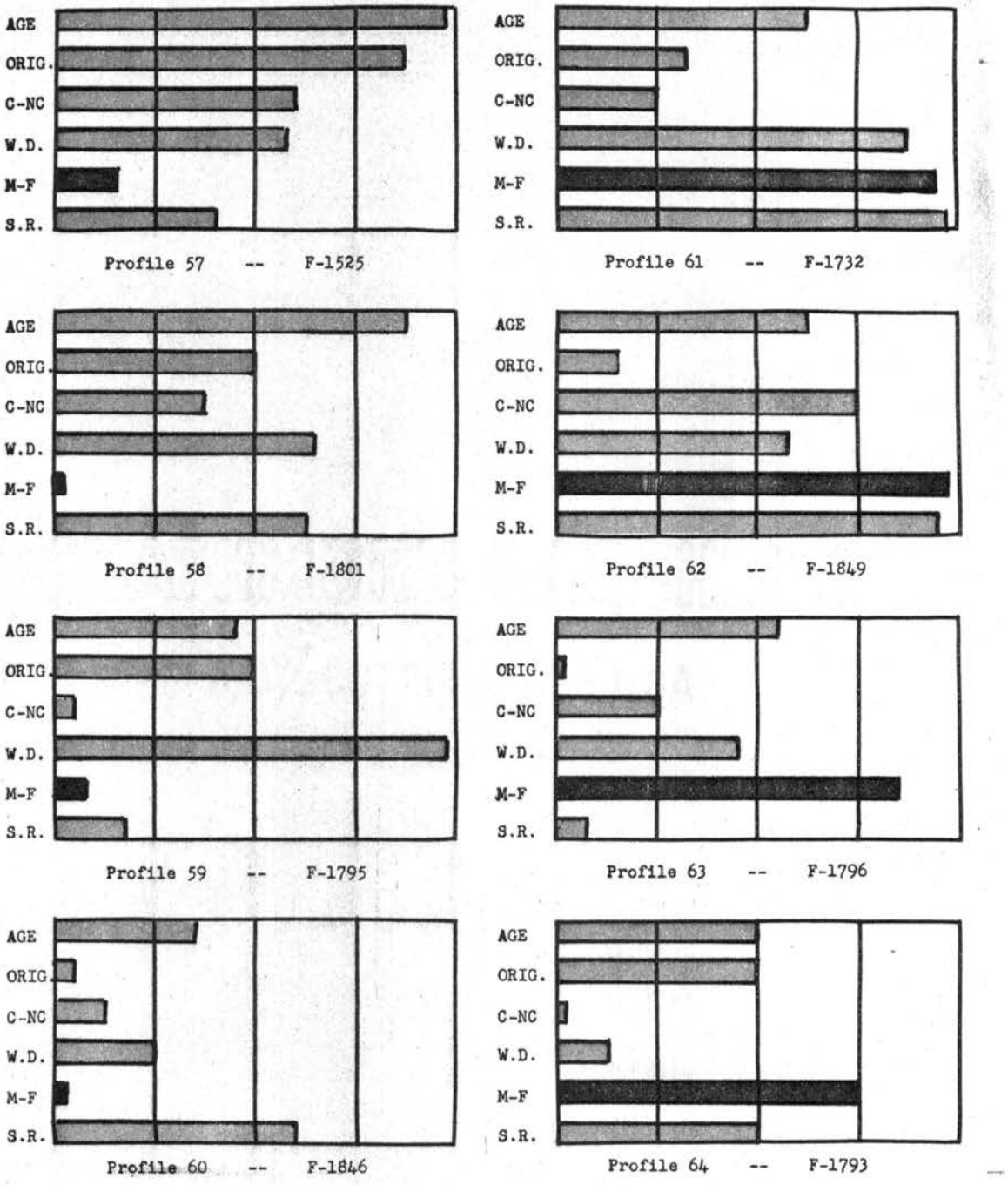

Figure 8. Creativity profiles of girls scoring high and low in femininity (M-F).

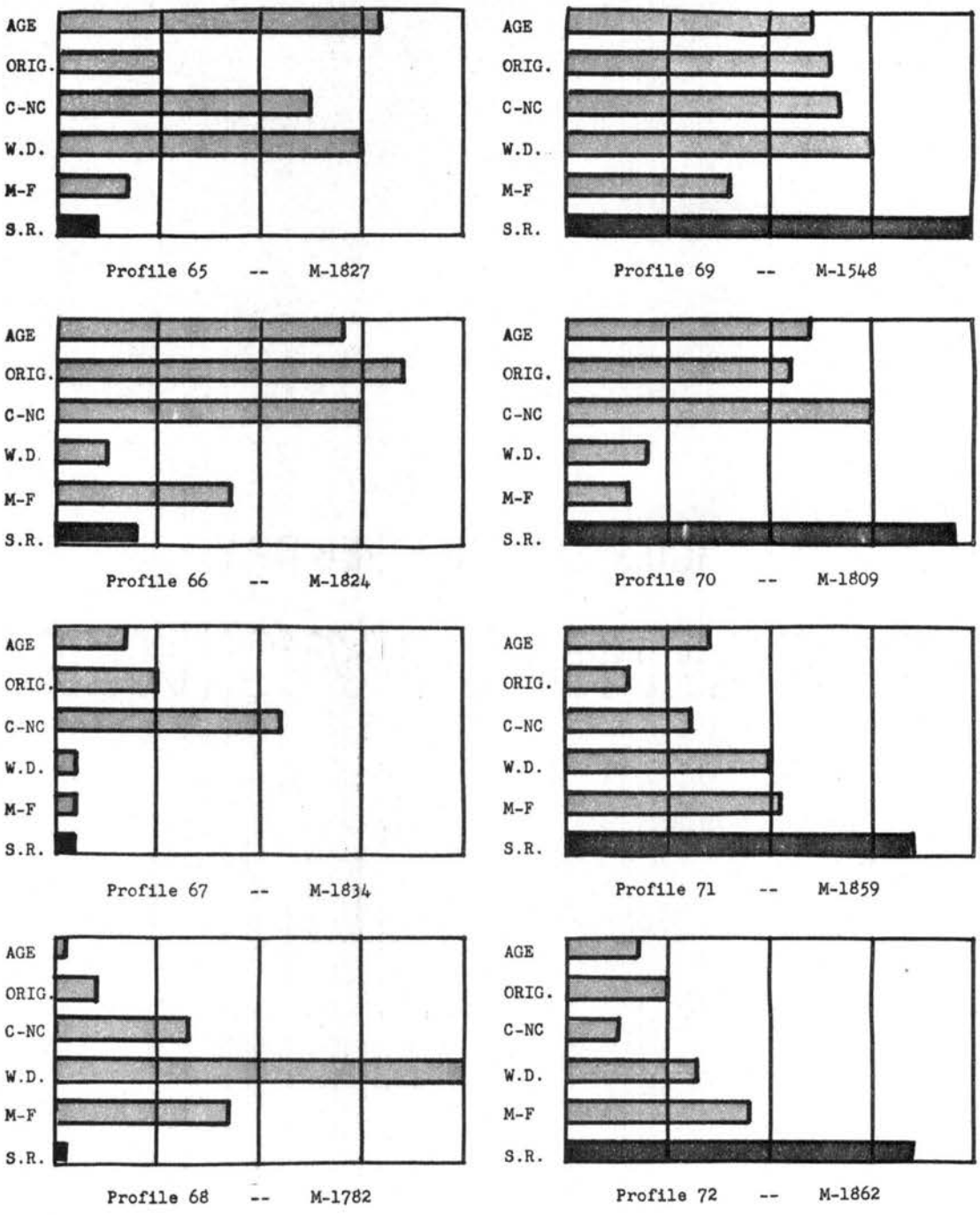

Figure 9. Creativity profiles of boys scoring high and low in social relations (S.R.).

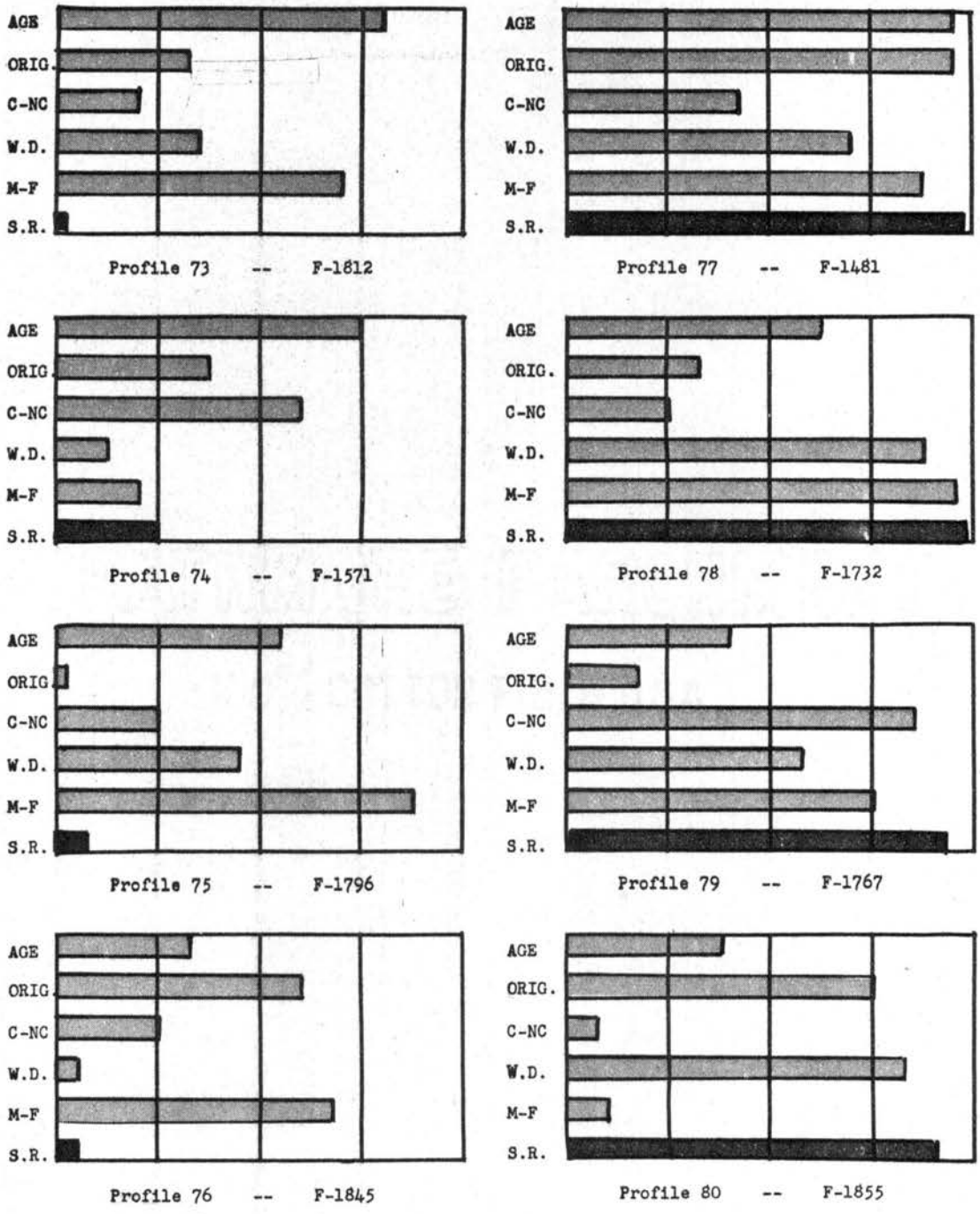

Figure 10. Creativity profiles of girls scoring high and low in social relations (S.R.).

VITA 2

Mona Ann Lane

Candidate for the Degree of

Master of Science

Thesis: CREATIVITY IN EARLY CHILDHOOD: A PROFILE STUDY OF CHARACTERISTICS RELATED TO CREATIVITY

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Professional Experience: Teaching Assistant, Oklahoma University Child Development Laboratory, Norman, Oklahoma, summer, 1965; Head Start Teacher, Oglala Sioux Poverty Program, Pine Ridge, South Dakota, 1966-1968; Graduate Assistant, Oklahoma State University Child Development Laboratories, Stillwater, Oklahoma, 1968-1969; Graduate Research Assistant, Department of Family Relations and Child Development, Oklahoma State University, Stillwater, Oklahoma, 1969-1971.

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