THE RELATIONSHIP OF MATERNAL TEACHING BEHAVIORS AND CREATIVITY IN PRESCHOOL CHILDREN

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This article is based on the Doctoral thesis research of the author conducted under the direction of James D. Moran III. The author wishes to thank the parents and children from the Oklahoma State University Child Development Laboratories who participated in this study. Thanks is also extended to Supra Wimbarh for her help in collecting and coding data.

Abstract

The purpose of this research was to investigate interaction patterns between young children and their mothers which foster creative thought. This study focused on the relationship between the strategies that mothers use when they play with and teach their children and the children's creativity. Mothers' behavior was assessed with the Maternal Teaching Observation Technique. The Multidimensional Stimulus Fluency Measure was used to measure children's creativity. The subjects for this project consisted of 20 mother-child dyads from a University Laboratory school. Children were between the ages of 46 and 66 months. Results indicate a negative correlation between children's original scores and mothers' use of visual cue. Children's original scores were also found to be correlated with maternal negative feedback and positive physical control. Analyses revealed that children who continued to play had mothers who used less modeling. These findings have direct implications for early childhood education programs, teacher training programs, and parenting.

The Relationship of Maternal Teaching Behaviors and Creativity in Preschool Children

Creativity has been defined as the natural mental process for which there is no learned solution, the combining of previous knowledge to generate possible solutions, and evaluating those solutions for implementation (Torrance, 1978). The study of creative children can be traced to the work of Terman (1925) which spanned more than fifty years and helped to establish the study of human development as a science. Despite its historical place of prominence as a topic in child development and education, creativity has remained illusive, defying the scrutiny of researchers.

Although the importance of identifying and enhancing original thinking in children has been recognized throughout the educational community, there have been relatively few studies on creativity in young children (Arasteh & Arasteh, 1976). Several researchers (Miller & Gerard, 1979; Moran, Milgram, Sawyers & Fu, 1983; Torrance, 1962; Albert & Runco, 1987) have suggested that certain contextual variables impact the development and expression of creativity in children. One contextual issue involves how and to what extent do early family experiences contribute to the development of creativity. The behaviors and attitudes of parents in relation to have received considerable research attention (Dewing &

Taft, 1973; Fu, Moran, Sawyers & Milgram, 1983; Miller & Gerard, 1979; Albert & Runco, 1987) but often with inconsistent or mixed results.

Miller and Gerard (1979) reviewed studies linking children's creativity to family background characteristics and parent-child relations. Such studies tend to present findings based on general attitudes rather than specific behaviors. For example, Miller and Gerard's review of research indicates that creative children and their parents tend to have relationships that are neither overly close nor hostile or detached, but characterized by freedom, independence and respect (Dewing, 1970; Dewing & Taft, 1973). Other studies (Domino, 1969; Getzels & Jackson, 1961) in the review suggest that parents who are highly competent and personally secure have children who are more creative. Likewise it is suggested that a family's social class is related to verbal creativity in children (Ogeltree & Ujlaki, 1973). Many of these studies are not conclusive and others are contradictory. It is interesting to note that of the sixty-one studies reviewed by Miller and Gerard (1979) only four involved preschool children and their parents.

Research on specific contextual variables and preschoolers' creativity is likewise sparse. Moran, Sawyers and Moore (1988) investigated the effects of structured and unstructured materials on the creativity scores of preschool children. Findings indicated that

the use of structured materials may limit preschool children's production of ideas. Other contextual variables, yet uninvestigated, may also impact the development and expression of creativity in young children.

Research (Bomba, Goble, & Moran, 1988) investigating parental attitudes concerning rewards with young children found such attitudes to be generally unpredictive of children's creativity. However, research of actual reward behavior (Groves, Sawyers, & Moran, 1987), has found that rewards decrease the flexibility of thought. Thus research studies investigating attitudes and not actual behavior may have different findings. The investigation of direct parental behaviors may be a more effective means of identifying those contextual variables that actually impact creativity in children.

In other areas of cognitive development, early home environment and quality of stimulation have been found to be positively correlated with cognitive competence (Bradley & Caldwell, 1980; Bradley, Caldwell, Rock, & Harris, 1987; Gottfried & Gottfried, 1987). Likewise, in related research, differences have been found in the types of teaching strategies mothers use with their young children as a function of the mother's socioeconomic level and educational background (Brophy, 1970; Laosa, 1978; Laosa, 1980).

The purpose of this research was to examine the relationship between the behaviors that mothers exhibit

in both teaching and nonteaching situations with their young children and the children's creativity. It was hypothesized that maternal interaction techniques impact the development and expression of creativity in preschool children.

Method

Subjects

The subjects were 20 3-to 5-year old children from a University Laboratory school and their mothers. All of the children were from middle to upper-middle socioeconomic homes. Nine (45%) of the children were females and eleven (55%) were males. Mothers of children were invited to participate by letter. Those indicating willingness to be part of this study were contacted by telephone to schedule a testing time.

Instruments

Parental Behavior. Each mother's teaching and nonteaching behavior was assessed with the Maternal Teaching Observation Technique (Laosa, 1978). This instrument is designed to measure the occurrence of the following behaviors:

Inquiry - the mother asks the child a question.

Directive - the mother commands the child to do a certain thing.

Negative verbal feedback or disapproval - the mother verbally indicates that she is displeased with the child or the child's activity or product.

Modeling - the mother works on the model either fastening or unfastening two parts while the child observes.

Visual cue - the mother provides a cue to a give aspect of the task by attracting the child's attention by sliding, pushing, or lifting a part or portion of the model being assembled.

Physical affection - the mother expresses favorable a favorable feeling toward the child by making physical contact.

Positive physical control - the mother manually controls the child's motor behavior as an attempt to facilitate the child's solution of the task.

Negative physical control - the mother displays disapproval through nonverbal behavior by restraining the child's motor behavior.

Parental Attitudes. Mothers were also asked to complete a one page Adult Adjective Checklist (Tower, 1980). The questionnaire consisted of three distinct clusters of adjectives designed to elicit self descriptions of resourcefulness, responsibility, and relationships. Instructions asked the participant to indicate how well each word listed described her by entering a number in the blank beside each adjective.

Codes for responding were as follows: (1) Not at all descriptive of me; (2) Slightly descriptive of me; (3) Moderately descriptive of me; (4) Very descriptive of me. Questionnaires were sent to each mother's home to be completed.

Creative Potential. The Multidimensional Stimulus Fluency Measure (Moran, Milgram, Sawyers, Fu, 1983) was used to measure children's creative potential via ideational fluency. The MSFM instrument consists of three subtests designed to elicit verbal responses from young children. In the first subtest, the instances task, children are asked to name all the things they can think of that have a specific characteristic (i.e., round, red). The patterns task requires subjects to look at and handle three dimensional styrofoam shapes and name all of the things each shape could be. Children are asked to name all the uses they can think of for a specific object (i.e., box, paper) in the unusual uses task.

Procedure

Each child's ideational fluency was assessed with the MSFM in a private room away from the regular classroom. MSFM testing was conducted on days that did not coincide with the mother-child interaction sessions.

At scheduled times, mother-child dyads were shown to a designated room. The room was furnished with a small table and two chairs. A microphone was suspended from the ceiling above the table to enable the recording of the mother-child conversation. The researcher made all

possible effort to ensure that the mother and child were comfortable and relaxed in the test setting.

Each mother and child were escorted to room and asked to be seated at a table, which was adjacent to a one way mirror through which the mother and child were videotaped. The researcher then gave the following instructions: Here are some Tinkertoys for you and (child's name) to play with. I will be back in a few minutes." The researcher then left the room for a period of seven minutes, during which time the mother and child were videotaped from another room. The researcher then returned to the room and gave the following instructions to the mother: "I would like for you to teach (child's name) how to build an airplane with Tinkertoys. Here is an airplane that you may look at and use as a model, if you wish." The researcher then placed an airplane model, which had been made with Tinkertoy, on the table. The Tinkertoys necessary for building the airplane model had been on the table when the mother and child began playing. The researcher then left the room for another seven minute period. The researcher then returned to the room and asked the mother to move to another area of the same room to be debriefed. Videotaping continued to assess if the child continued to play with the Tinkertoys without the mother at the table.

During the debriefing each mother was asked if her child had Tinkertoys at home. Mothers' responses of "yes" or "no" were recorded on a score sheet.

The researcher also indicated on the score sheet whether or not each mother-child dyad attempted to make the presented airplane model. It should be noted that all 20 mother-child pairs did attempt to make an airplane like the model, though the instructions did not specify that the exact model needed to be made.

Scoring

The scoring of the maternal interaction behavior, measured by the MTOT, and children's ideational fluency, measured by the MSFM, was done independently to avoid possible bias. For the Multidimensional Stimulus Fluency Measure scoring (Godwin, 1984) each child's responses were written down and scored as popular (given by more than 5% of the normative group) or original (given by less than 5% of the normative group). Bizarre and repeat responses for each of the three tasks were not counted in the scoring.

An observer was trained by using a sample videotape. At that time, baseline reliability levels of at least .90 were established. Mother's behavior scores were obtained by recording the frequency of occurrence in each seven minute session of the following: inquiry; directive; praise; negative verbal feedback or disapproval; modeling; modeling; visual cue; physical affection; and, positive physical control.

Mothers's scores on the adjective checklist were obtained by computing Likert scores in each of the three clusters. Each mother received a score for resourcefulness, responsibility, and relationships.

Results

Correlational analyses demonstrated relationships between children's original scores on the MSFM and mothers' use of visual cue in both the play session, $r = -.56$, $p < .01$, and teaching session, $r = -.44$, $p < .05$, as well as between original scores and maternal negative feedback, $r = .51$, $p < .05$, and positive physical control, $r = -.40$, $p < .05$, during the teaching session.

Additional analyses were conducted to determine which parental behaviors were linked to the continuation of playing with the Tinkertoys by the child after the mother left the table. Separate t-tests were run comparing maternal behaviors for children who continued to play ($n = 15$) and those who did not ($n = 5$). For those children who continued to play, mothers used less modeling, $t\ (19) = .39$, $p < .001$.

Paired t-tests were used to assess changes in maternal behaviors from the play to the teaching session. Specifically, during the teaching session mothers demonstrated more inquiry, $t\ (19) = -3.74$, $p < .001$, directives, $t\ (19) = -4.82$, $p < .001$, praise, $t\ (19) = -2.24$, $p < .001$, visual cues, $t\ (19) = -5.28$, $p < .001$, and positive physical control, $t\ (19) = -2.56$, $p < .05$.

These results are shown in Table 1.

Insert Tables 1 & 2 about here

No significant gender differences were found. Likewise no significant findings resulted from the adjective checklist. Mothers' resourcefulness scores on the adjective checklist had a range of 15 to 33 (M = 25.33, SD = 5). Relationship scores had a range of 20 to 35 (M = 28.44, SD = 4.59). The range of responsibility scores was 14 to 32 (M = 25.67, SD = 4.42).

Discussion

Major findings of the study show that the children with more creative potential tended to have mothers who provided fewer visual cues, less positive physical control, and more negative feedback during the teaching session. These mothers also offered fewer visual cues during the play session.

The use of visual cue by mothers involved providing a demonstration, short of actually attaching toy pieces, of how toy parts should be assembled. Thus it appears that mothers of children with more creative potential provided less structure during the teaching session, allowing their children to construct without cues or demonstration from the mother. Likewise, mothers of children with more creative potential did not attempt to

facilitate their children's solution of the task by manually controlling children's motor behavior. These findings appear to be consistent with previous research results (Moran, Sawyers, & Moore, 1988) indicating that structure limits children's creative potential.

Findings that negative verbal feedback was used more by mothers of children with more creative potential may indicate that these children were less intent on building the presented model. These findings suggest a reciprocal interaction between the more creative children and their mothers' behaviors. Mothers may have attempted to direct these children to build the model by voicing disapproval when the children created on their own. Disapproval with the children's' activity or product may have been used more often by mothers of children with more creative potential because these children tended to build with the toys in a way that was not confined to making a replica of the presented model. The more creative children may not have been fixed on only one correct way to build a toy airplane, even though a model was presented.

The finding that mothers of children who continued to play demonstrated less modeling is interesting in terms of its relation to previous findings. Research (Moran, Sawyers, & Moore, 1988) on the effects of structure on children's creativity suggest that structured instructions, in the form of modeling, when combined with

structured materials limits the child's ideational abilities. In the present study modeling appears to also affect the child's task persistence and intrinsic motivation as evidenced by cessation of play.

An interesting sidelight of this study of original thinking involved how the mothers changed behaviors from the play to the teaching session. Mothers appear to have interpreted teaching as a convergent task (each mother in the study directed her child to make an airplane like the model) with only one correct solution. Mothers exerted more structure on the children's behavior during the teaching session by telling or showing the child what to do to build a replica of the airplane model. These changes of behavior have serious implications for not only parents but also for teachers when one considers research findings in this and other studies showing the negative effects of these behaviors on young children's original thinking.

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Table 1

Means and Standard Deviations of Maternal Behaviors During Interaction Sessions

Frequency of Maternal Behaviors	Play Session		Teaching Session		
	M	SD	M	SD	T Value
Inquiry	4.05	2.78	13.55	10.26	-3.74**
Directive	5.40	3.11	21.35	13.98	-4.82**
Praise	4.00	3.12	8.00	7.73	-2.24**
Negative Verbal Feedback	0.20	0.52	2.35	5.85	-1.63
Modeling	26.75	14.73	26.05	16.93	0.18
Visual Cue	7.70	4.33	17.15	9.27	-5.28**
Physical Affection	0.00	0.00	0.00	0.00	0.00
Positive Physical Control	0.00	0.00	0.80	1.39	-2.56*
Negative Physical Control	0.00	0.00	0.10	0.45	-1.00

*p<.05 **p <.001

Table 2

Means and Standard Deviations of Maternal Behaviors and Children's Continuance of Play

Frequency of Maternal Behaviors	Children Continued to Play		Children Did Not Continue to Play		
	M	SD	M	SD	T Value
Inquiry	14.60	11.16	10.40	6.91	0.78
Directive	23.67	14.97	14.40	8.02	1.31
Praise	9.40	8.46	3.80	2.28	1.44
Negative Verbal Feedback	3.07	6.65	0.20	0.48	0.95
Modeling	19.20	11.07	46.60	15.11	-4.39*
Visual Cue	17.53	9.08	16.00	10.84	0.31
Physical Affection	0.00	0.00	0.00	0.00	0.00
Positive Physical Control	0.80	1.47	0.80	1.30	0.00
Negative Physical Control	0.13	0.51	0.00	0.00	0.57

*$p < .0001$

APPENDIX A

LITERATURE REVIEW

REVIEW OF THE LITERATURE

The Relationship of Maternal/Child Interaction and Creativity in Preschool Children

In the early 1900's Alfred Binet developed open-ended multiple-solution measures of intelligence which we now call divergent thinking tests (Barron & Harrington, 1981). Although Binet excluded these items from his test batteries, he was successful in producing the first method of measuring intellectual developmental progress in children (Gowan, 1977).

In 1910 a professor at Stanford University, named Lewis Terman, translated and revised Binet's scales into English. Terman multiplied the rate of intellectual developmental progress by 100 and named it the "intelligence quotient" (Gowan, 1977). Terman's interest in intelligence inspired a life-long study of genetic genius which helped set the stage for the developmental study of creativity.

Much has happened in creativity theory and research since Terman's (1925) work first appeared in the literature. In more recent times theorists have attempted to explain creative thought and how such thoughts occur in the human mind. J. P. Guilford (1956) proposed a structure of human intellect composed of factors:

thinking factors and memory factors. Guilford explains thinking as first cognition or discovery (either perceptual or conceptual), followed by the production of some end result (results might be figural, conceptual, or structural). These production factors consist of two types, according to Guilford, one being convergent and the other divergent. Divergent thinking occurs when no one answer or conclusion is clear, the person has to "search" for a solution. On the other hand, convergent thinking consists of channeling thinking in the direction of one correct answer or conclusion.

Guilford (1956) describes thinking in terms of several subprocesses. These processes are described in categories: fluency; flexibility; and novelty. Within the fluency subprocesses, Guilford identified the following factors: word fluency, the ability to produce words that meet particular requirements; associational fluency, the ability to produce words that meet particular requirements of meaning; ideational fluency, the ability to produce ideas which meet particular requirements; and expressional fluency, the ability to put words into a particular sentence structure. It is the ideational factor which has proved to be the most effective means of assessing creativity in preschool children.

Based on the work of Guilford and his colleagues, E. P. Torrance (1966) formulated a definition of creative thinking which includes a sequence of steps, beginning with problem detection and ending with problem solution. To Torrance, creative thinking is the process of problem solving. This definition has been incorporated by other researchers (Moran, Sawyers, Milgram, & Fu, 1983) into specific models of creative thinking and the measurement of that thinking in young children.

Mednick (1962) has approached creativity in associative terms. That is, Mednick proposes that creativity is the ability to form associative elements into new, original combinations which are either useful or meet a specific requirement. Mednick's model is distinguished from original thinking by the inclusion of usefulness of associations. To Mednick, the more mutually remote the characteristics of the new association the more creative.

Based on the work of Guilford (1956, 1957) and Mednick (1962), Wallach and Kogan (1965) formulated a model for the measurement of creativity that proposes: (a) that creativity and intelligence are distinct; (b) that the best single measure of divergent thinking is ideational fluency; (c) that the quantity of ideational

responses is related to its quality; (d) that a response hierarchy exists in which popular responses are usually given early and original responses are given later; and (e) that a nonevaluative atmosphere is most conducive for the assessment of creativity. Recent research findings (Moran, Milgram, Sawyers, & Fu, 1983) have found the Guilford-Mednick model to be applicable to young children.

Tasks of ideational fluency, based on Guilford's work, have been used by Ward (1968, 1969) and Williams and Fleming (1969) with young children that parallel those tasks used by Wallach and Kogan (1965) with older subjects. These tasks are designed to elicit verbal responses to stimuli, thus providing a means of assessing ideational fluency.

Ward (1968) utilized ideational fluency in measuring the divergent thinking abilities of 7- and 8-year old boys. As Wallach and Kogan (1965) had done, Ward emphasized a non-evaluative atmosphere while administering tasks designed to elicit verbal responses. Ward used Wallach and Kogan's uses task, asking the child what a specific of object could be used for; patterns task, the child is asked to interpret figures; and the instances task, asking the child to name objects which have a

certain characteristic. Ward's (1968) study also replicated Wallach and Kogan's previous finding that creativity and intelligence appear to be separate cognitive functions.

Starkweather (1964, 1971) suggested that creativity measures with young children should be based on the cognitive level of the child and also the child's need for tactile exploration. Starkweather designed three-dimensional materials specifically for the assessment of creativity in preschool children.

Starkweather (1971) believed that the search for factors which influence the development of creative abilities should be focused on infants and preschool children. Starkweather suggested that children are born with the potential to express themselves freely. This freedom of expression could either be encouraged, stifled, or remain dormant depending on the child's experiences, Starkweather proposed. Starkweather (1971) designed several instruments in her attempt to measure creativity in young children. Theses instruments incorporated Starkweather's belief that young children should be allowed to handle three dimensional materials during the testing situation.

Most recently, the Multidimensional Stimulus Fluency Measure (MSFM) (Moran, Milgram, Sawyers & Fu, 1983) which was adapted from materials by Wallach and Kogan (1965), Ward, (1968), and Starkweather (1971) has been found to be

a valid, reliable instrument for the assessment of creativity in young children. This instrument allows children to manipulate three dimensional materials designed to elicit verbal responses, in addition to asking for the uses of objects readily familiar to young children and for responses to other common stimuli.

The Multidimensional Stimulus Fluency Measure uses tasks of ideational fluency that parallel those used by Wallach and Kogan (1965) with older children. These ideational fluency tasks are called unusual uses, pattern meanings, and instances. The unusual uses task asks children to name all the uses they can think of for a stimulus item. In the patterns task children look at and handle a three dimensional starofoam shape and name all the things that the pattern or shape could be. The instances task asks children to name all the things they can think of that have a particular feature.

Moran and colleagues (1983) have incorporated the special needs of young children into the design and administration of the MSFM. The MSFM uses ideational fluency as a measure of young children's divergent thinking and elicits these responses with three dimensional objects that the children may handle. In addition, the MSFM imposes no time restraints on responding. When scoring MSFM responses a distinction is made between popular and original (those given by less than 5% of the sample) thus giving a more accurate measure of children's divergent thinking abilities.

Divergent thinking research (Pezzullo, Thorsen, & Madaus, 1972) comparisons of fraternal and identical twins suggest weak genetic influences. Thus, it appears that there may be a wide environmental margin in which creative thinking can be enhanced by experience.

In recent years creativity research with young children has focused on contextual variables that possibly impact the development and expression of creativity (Miller & Gerard, 1979; Moran, Milgram, Sawyers, & Fu, 1983; Albert & Runco, 1987). Many of these investigations have researched the behaviors and attitudes of parents in relation to young children's creativity (Dewing & Taft, Fu, Moran, Sawyers, & Milgram, 1983; Miller & Gerard, 1979). These studies have often produced inconsistent or mixed results.

Miller and Gerard (1979) reviewed studies linking children's creativity to family characteristics and parent-child relations. Comparisons of the available research was difficult given differences in samples and measurement instruments. Miller and Gerard (1979) proposed that reviews of the research suggested a positive correlation between parental social class and children's verbal creativity. In addition, the review indicated that no gender differences were exhibited in young children's abilities. However, older girls tended to have higher verbal and older boys higher figural creative abilities.

Miller and Gerard's (1979) review suggested that parents of creative children were personally secure and highly competent. Parental-child relationships of creative children were based on respect, independence, and freedom. The review offered evidence that background characteristics of families, parental attitudes and behaviors toward one another and their children tend to affect the development of creative potential in children. Socioeconomic status of parents was found to be associated with creativity in preschool children. Middle class boys were found to have higher originality scores on measures of creative thinking.

Although many studies have investigated the relationship between parental attitudes and behaviors and children's creativity, most of the samples consisted of school age children. In Miller and Gerard's (1973) review of research only four studies involved preschool children and their parents. The absence of research literature focusing on the development and enhancement of creativity in young children is indeed ironic given the accumulation of research since the 1960's showing the importance of children's experiences between birth and first grade on cognitive development. Recently researchers (Aoki & Siekevitz, 1988) have suggested that these early childhood experiences actually activate specific neural pathways while allowing other neural pathways to fall into disuse.

In other areas of cognitive development, early home environment and quality of stimulation have been found to be positively correlated with cognitive competence (Bradley & Caldwell, 1980; Bradley, Caldwell, Rock, & Harris, 1987; Gottfried & Gottfried, 1987). Longitudinal research (Bradley & Caldwell, 1980) investigating the early home environment and cognitive competence have findings that suggest significant relationships between stimulation with toys, language stimulation, physical environment, and parental affection, and children's IQ scores. It is possible that other relationships exist between early home environment and other cognitive domains, such as creativity.

It has been suggested (Bettelheim, 1987; Brophy, 1970; Laosa, 1978; Laosa, 1980) that mothers function as teachers in their everyday interactions with their children. Thus children's experiences in the home are mediated by maternal teaching strategies. Bettelheim (1987) has stated:

> I am convinced that while both parents contribute significantly to a child's being raised well (or not so well), it is the mother, particularly in the early years, who is apt to play the considerably more important role in the process. (p.xi)

In related research, differences have been found in the types of teaching strategies mothers use with their

young children as a function of the mother socioeconomic level and educational background (Brophy, 1970; Laosa, 1978; Laosa, 1980). Laosa (1980) found that the higher the mothers' level of formal education the more they used praise and inquiry as teaching strategies with their children. Findings also suggested that the lower the mothers' level of formal education the more they used modeling as a teaching strategy, and for boys the more they used physical control and punishment as teaching techniques.

A few researchers have attempted to investigate the effects of early childhood experiences and specific contextual variables on creativity. One such contextual variable is the use of reward, which is often considered a motivational factor by both teachers and parents. Groves, Sawyers, and Moran (1987) explored the effects of reward on preschool children's ideational fluency. Findings suggest that reward (or the promise of reward in this study) appears to hamper preschool children's ideational fluency. Children who did not receive rewards scored higher on ideational fluency than did rewarded children. Rewards were found to affect the originality, flexibility, and fluency components of ideational fluency.

Bomba, Goble, and Moran (1988) investigated parental attitudes concerning rewards with preschool children. Results indicate that parental attitudes are generally unpredictive of children's creativity. These findings

appear to be inconsistent with those of Groves, Sawyers, and Moran (1987). However, research of actual parental behaviors may produce different findings from research that uses surveys of parental attitudes.

In another study, Fu, Moran, Sawyers, and Milgram (1983) examined the relationship between parental child rearing attitudes, personality, and creativity and preschool children's creativity. No significant findings were found. It is perhaps important to note that this study did not assess actual parental behaviors in regard to child rearing attitudes. The researchers administered a self report assessment of behaviors. It may be that parents tend to report their ideal rather than their actual child rearing attitudes.

In related contextual research, Moran, Sawyers, and Moore (1988) investigated the effects of structured materials and instruction on preschooler's creativity. Findings suggest that structure in both materials and instructions in preschool children's environment effects flexibility scores of ideational fluency, producing less flexibility. It is interesting that in this study structured instructions were little more than modeling by the researcher.

The findings of the present study and those of others suggest that further research investigations should focus on actual behaviors in specific contextual settings. Such

investigations may help to clarify the previous inconsistencies in the literature in regard to the development and expression of creativity in preschool children.

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APPENDIX B

RESEARCH INSTRUMENT

MULTIDIMENSIONAL STIMULUS FLUENCY MEASURE
Ideational Fluency Instrument for Preschool Children

Subject # _____ Date _____

Child's Gender _____ Examiner _____

Instructions: The examiner says "Today we are going to play some games. These are thinking and imagination games. You don't have to hurry. We can play as long as you want." The examiner records the child's responses to each subtest.

Instances Subtest:

Item 1

Tell me all the things you can think of that are round.

Item 2

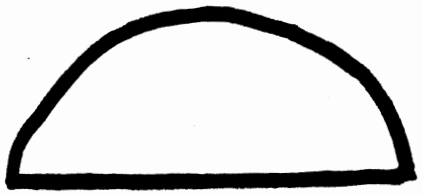
Tell me all the things you can think of that are red.

Patterns Subtest:

Three-dimensional forms are given to the child for tactile exploration.

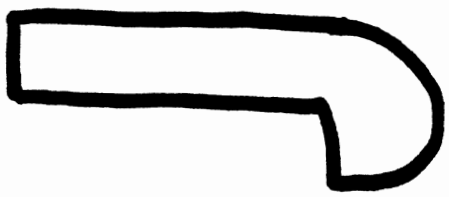
Item 1

Tell me all the things you think this could be.



Item 2

Tell me all the things you think that this could be.



Uses Subtest:

Item 1

Tell me all the things you could use a box for.

Item 2

Tell me all the things you could use paper for.

Scoring: Each response is scored as popular, given by more than five percent of the population, or original, given by less than five percent of the population. Repeat and bizarre answers are not coded.

APPENDIX C

RAW DATA

```
01 2 2 2 1 07 11 07 02 30 06 00 00 00
01 03 12 05 01 37 28 00 01 00
01 30 32 32 02 03 01 05 04 01 07 09 16
02 1 2 1 1 01 01 04 00 22 12 00 00 00
02 07 30 11 04 15 12 00 02 00
02 22 18 34 03 02 00 06 01 02 04 10 14
03 2 2 1 1 06 03 02 00 16 13 00 00 00
03 02 12 00 00 09 40 00 00 00
03 23 25 34 05 02 00 09 02 00 07 11 18
04 1 2 1 1 01 05 00 00 29 06 00 00 00
04 16 35 04 00 35 14 00 00 00
04 26 27 31 24 06 00 11 06 01 30 18 48
05 2 2 1 1 01 04 06 00 13 06 00 00 00
05 00 04 04 00 06 27 00 00 00
05
06 1 2 2 1 00 02 01 00 32 09 00 00 00
06 15 19 07 00 39 15 00 03 00
06 24 25 25 01 04 01 03 01 04 03 11 14
07 1 1 1 1 07 04 02 00 42 03 00 00 00
07 25 37 20 00 12 09 00 03 00
07           02 07 00 04 04 02 06 13 19
08 2 2 1 1 03 06 04 00 42 08 00 00 00
08 12 05 01 01 32 18 00 00 00
08 28 25 32 07 02 01 06 01 06 09 14 23
09 2 2 1 1 05 05 05 00 01 04 00 00 00
09 05 09 05 02 21 14 00 00 00
09 21 23 26 05 02 02 05 26 06 33 13 46
10 2 2 1 1 02 07 12 01 18 09 00 00 00
10 20 17 07 01 37 15 00 00 00
10 32 28 35 04 02 01 07 07 05 12 14 26
11 2 2 1 1 05 08 04 00 24 19 00 00 00
11 17 11 04 00 08 17 00 00 00
11 15 26 29 04 02 04 05 03 02 11 09 20
12 1 1 1 1 09 09 04 00 06 12 00 00 00
12 08 10 02 01 26 27 00 00 00
12 24 32 25 05 02 03 09 06 36 14 50
13 1 2 2 1 04 07 04 00 48 07 00 00 00
13 07 26 03 00 36 26 00 00 00
13 32 28 27 07 10 02 10 05 03 14 23 37
14 1 2 1 1 01 10 03 00 21 12 00 00 00
14 42 33 22 00 04 27 00 00 00
14 28 29 24 08 06 02 06 04 01 14 13 27
15 1 2 1 1 06 05 09 00 16 05 00 00 00
15 14 53 24 06 13 11 00 01 00
15 25 28 20 04 04 04 07 11 05 19 16 35
16 2 2 2 1 06 01 02 00 14 05 00 00 00
16 20 08 03 00 49 04 00 00 00
16 18 26 25 03 04 06 05 10 03 19 12 31
17 1 2 2 1 08 06 01 00 47 05 00 00 00
17 07 07 01 00 72 07 00 00 00
17 21 14 22 04 07 02 06 18 03 24 16 40
18 2 1 1 1 00 01 00 00 45 00 00 00 00
18 25 35 21 26 18 05 00 00 00
18 24 26 29 17 07 03 11 17 09 37 27 64
19 2 2 1 1 04 03 02 01 50 09 00 00 00
19 04 39 03 05 33 16 00 05 02
19 33 28 35 07 04 00 07 07 08 14 19 33
20 2 1 1 1 05 10 08 00 19 04 00 00 00
20 22 25 13 00 19 11 00 01 00
20 30 22 27 16 03 00 05 04 04 20 12 32
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APPENDIX D

VARIABLE CODES

```
VARIABLE LABELS
  V1 'SUBJECT NUMBER' V2 'GENDER' V3 'TOYS' V4 'PLAY'
  V5 'MODEL' V6 'INQUIRY 1' V7 'DIRECTIVE 1' V8 'PRAISE 1'
   V9 'NEG FD BK 1' V10 'MODELING 1' V11 'VISUAL CUE 1'
  V12 'PHY AFFECTION 1' V13 'POS PHY CONTROL 1'
   V14 'NEG PHY CONTROL 1' V15 'SUBJECT NUMBER'
   V16 'INQUIRY 2' V17 'DIRECTIVE 2'
   V18 'PRAISE 2' V19 'NEG FED BK 2'
   V20 'MODELING 2' V21 'VISUAL CUE 2'
   V22 'PHY AFFECTION 2' V23 'POS PHY CONTROL 2'
   V24 'NEG PHY CONTROL 2'
   V25 'SUBJECT NUMBER' V26 'RESOURSEFULNESS'
    V27 'RESPONSIBILITY' V28 'RESLATIONSHIP'
     V29 'OR INSTANCES' V30 'POP INSTANCES'
    V31 'OR USES' V32 'POP USES'
    V33 'OR PATTERNS' V34 'POP PATTERNS'
    V35 'OR TOTAL' V36 'POP TOTAL'
    V37 'TOTAL FLUENCY'
VALUE LABELS
  V2 1 'FEMALE' 2 'MALE'/V3 1'YES' 2 'NO'/
  V4 1 'YES' 2 'NO'/ V5 1 'YES' 2 'NO'/
MISSING VALUES ALL(9999)
FREQUENCIES VARIABLES=ALL/
  STATISTICS ALL
```

APPENDIX E

SELECTED STATISTICAL ANALYSES

PEARSON CORRELATION COEFFICIENTS

	V35	V36	V37
V16	.1339	-.0948	.1229
	(19)	(19)	(18)
	P= .292	P= .350	P= .314
V17	.1271	.0221	.2448
	(19)	(19)	(18)
	P= .302	P= .464	P= .164
V18	.1428	-.0728	.1702
	(19)	(19)	(18)
	P= .280	P= .384	P= .250
V19	.5110	.2759	.6154
	(19)	(19)	(18)
	P= .013	P= .126	P= .003
V20	.1443	.0618	.1614
	(19)	(19)	(18)
	P= .278	P= .401	P= .261
V21	-.4359	.1239	-.4129
	(19)	(19)	(18)
	P= .031	P= .307	P= .044
V22	.	.	.
	(19)	(19)	(18)
	P= .	P= .	P= .
V23	-.3974	-.1538	-.3248
	(19)	(19)	(18)
	P= .046	P= .265	P= .094
V24	-.0406	.0692	.0526
	(19)	(19)	(18)
	P= .434	P= .389	P= .418

PEARSON CORRELATION COEFFICIENTS

	V35	V36	V37
V6	-.0839 (19) P= .366	.2351 (19) P= .166	-.1576 (18) P= .266
V7	-.0927 (19) P= .353	.1135 (19) P= .322	-.1522 (18) P= .273
V8	-.1775 (19) P= .234	-.1328 (19) P= .294	-.2325 (18) P= .177
V9	-.2404 (19) P= .161	-.1576 (19) P= .260	-.2368 (18) P= .172
V10	-.0572 (19) P= .408	-.0464 (19) P= .425	.1426 (18) P= .286
V11	-.5629 (19) P= .006	-.0464 (19) P= .425	-.6056 (18) P= .004
V12	. (19) P= .	. (19) P= .	. (18) P= .
V13	. (19) P= .	. (19) P= .	. (18) P= .
V14	. (19) P= .	. (19) P= .	. (18) P= .

VITA

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