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Relationship between Playfulness and Motor Creativity in Preschool Children

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Previous research has noted a corresponding relationship between young children's play and divergent thinking ability. This study examined how far fluency and flexibility in movement patterns' production, as indicatory elements of divergent thinking and critical thinking, are related to a variety of psychological elements (physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy, sense of humor) that compositely contribute to playfulness, an internal personality characteristic. A total of two hundred and fifty preschool-aged children participated in this study. Their teachers completed the Greek version of Children's Playfulness Scale. The Divergent movement ability test was used to rate children's motor creativity. The data indicated a significant correlation between total playfulness and (a) motor fluency and (b) motor flexibility. This means that playfulness and motor creativity are interconnected because movement during preschool age is the primary way of action, expression, learning and development.

Keywords: Playfulness; Creativity; Motor fluency; Motor flexibility; Preschool children

INTRODUCTION

The importance of play for young children has long been established in terms of developing a child's ability to think divergently, including the capacity for critical thinking. Theory and research approach children's play as a personality trait and as a child's predisposition to engage in playful activities and interactions in a certain and individual way (Boyer, 1997). The research approach also studies play as an internal characteristic that is expressed in a stable and a reproducible manner within every environment (Barnett, 1990, 1991; Cattell, 1979; Lieberman, 1965, 1966; Singer and Singer, 1978; Singer, Singer, and Sherrod, 1980). According to this approach, children's playful behavior is guided by internal motivation towards a process with self-imposed goals, with a tendency to attribute their own meanings to objects and behaviors, to create fictional characters and to acquire a freedom in producing roles and activities, regardless of externally imposed enforcements (Rubin, Fein, and Veindeberg, 1983).

Lieberman (1965, 1966) was among the first to examine play by focusing more on the child rather than the setting. She clearly postulated the existence of the playfulness trait in young children and she identified five factors of this playfulness quality: (a) physical spontaneity, (b) social spontaneity, (c) cognitive spontaneity, (d) manifest of joy, and (e) sense of humor.

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Further support for the existence and the examination of the playfulness as a personality trait was provided by studies conducted by Singer and his colleagues, gathering data for children's behavior (Singer and Singer, 1978; Singer, Singer, and Sherrod, 1980). This research found that a playfulness factor could be identified and that children who scored high in this factor also scored high on positive affect, were physically active, showed a high degree of social and imaginative play, and were more verbal than less playful preschool age-mates.

However, environment and individual characteristics contributed in the modulation and the expression of playfulness. Research has shown that playful behavior was correlated with social and cultural factors (Parker, 1984), with personality characteristics (Athey, 1984; Barnett, 1991; Cattell, 1979; Lieberman, 1977; Roger, Meeks, Impara, and Frary 1991), with individual and family characteristics (Anderson, 1981; Barnett, 1991; Barnett and Kleiber, 1984; Carvey, 1977; Freyburg, 1978; McLoyd, 1980), and with parental attitudes and behaviors towards play (Baurmind, 1973; Barnett and Kleiber, 1984; Poel, Bruyn and Menk, 1991). This consideration for children's playful behavior is based on children's individual differences, which is the most common parameter that is ignored in education concerning decision-making and curriculum planning.

As research has indicated, playfulness as a personality trait was related to several personality factors, most of which have a cognitive profile, such as imagination, humor, curiosity, novelty-seeking, receptivity, communicativeness and persistence (Athey, 1984; Barnett, 1990; Cattel, 1979; Singer and Rummo, 1973).

When somebody observes children, he can note that they are usually more flexible and imaginative or exhibit creative thinking to a high degree during their play than they do during any other activities. Because of that, play is an important and encouraging field for stimulating creative thinking in children. Piaget (1962) pointed the important role of play in child's development, observing that play provides a creative imagination that can be used in later thought and reason. Flexibility and imagination exhibited by children in some types of play have value for creative thinking in other activities (Yawkey, 1986).

Creativity is a multi-dimensional construct and, as such, may be measured as a personality trait or "creative style". Creative activity has been described as involving the mental and physical process of remembering, organizing, imaging, expressing, and evaluating. It is how individuals interact with their environment and often entails new ways of seeing old problems or becoming aware of new problems (Cornelius and Casler, 1991). The creativity criteria are: (a) fluency (total number of different responses to a stimuli), (b) flexibility (variety of responses based on the changes in meanings, in interpretation, in an object usage, in understanding of a text, etc.), and (c) originality (uniqueness of the response in relation to the responses of the whole sample) (Irvin, 1976; Johnson, 1977; Wyrick, 1968).

Divergent play experiences positively affect preschool children's responses to creativity tasks (Pepler and Ross, 1981) and serve as one basis of our understanding of the relatedness of playfulness and creativity with young children. Helson (1965) studied the artistic creativity in female students who completed the IA-Index. Findings showed that the element, which generated the critical or determinant difference, was the frequency of activities that were playful in nature, the frequency of symbolic play and frequent daydreaming during childhood. Tegano (1990) found a high correlation between playfulness of early educators and their "tolerance of ambiguity", which is a critical element in creativity and indicates the tendency and the willingness to be involved in ambiguous and difficult situations and to find alternate solutions.

In most research, the nature and the relation of children's creativity were studied with playfulness behavior and it was thought to be the creative thinking ability or divergent thinking ability using both verbal and pictorial batteries (Barnett and Kleiber, 1982; Barretta

and Privette, 1990; Katiyar and Jarial, 1985; Liebernan, 1965, 1977). The examination of the relationship between playfulness behaviour and motor creativity, which was assessed through children's divergent movement ability, was the focus of this study. Motor creativity has been defined as the combination of perceptions into new and fresh motor patterns that can be either a solution to a pre-established problem, or the expression of an idea or emotion by means of the human body (Wyrick, 1968). Movement during preschool age is the primary and dominant way of action, expression, learning, communication and children's overall development (Gruber, 1986). According to Cleland (1994), children have the inherent ability not only to learn fundamental movement patterns, but also to control their movements and to express them creatively through the performance of different fundamental movement patterns. Children's efforts to produce different fundamental movement patterns on movement problems or tasks (divergent movement ability) involve aspects of both critical thinking and motor creativity (Cleland, 1994).

Motor creativity is the final product of a creative process that supposes cognitive action for production of movement ideas and for criteria usage (critical thinking). These criteria are used for the formation of logical decisions about motor responses. McBride (1992) was the first physical educator to define critical thinking relative to the psychomotor domain. He defined critical thinking in physical education as "reflective thinking that is used to make reasonable and defensible decisions about movement tasks or challenges" (p. 64), and he proposed a four-phase model that includes cognitive organizing, cognitive action, cognitive and psychomotor outcomes. According to critical thinking schema of McBride (1992), during the first step, when a problem requests the discovery of a movement or an idea, the cognitive organization is activated, as long as the child is able to focus on the problem-challenge and asks questions. The second step is cognitive action and refers to the ability to use the information generated during the previous step, to make judgments and to formulate hypotheses (cognitive action in movement – knowledge of how various locomotor, stability, and manipulative patterns were executed and modulated. During the third and fourth steps, the production of cognitive and psychomotor outcomes is activated. During these steps, critical thinking is required to decide whether a solution is different and to use criteria (knowledge of movement elements: space, effort, and relationship) for the planning of novel or modified movement patterns.

Ennis (1987) stated that formulating hypotheses, alternative ways of viewing a problem, questions, possible solutions and plans for investigating something are creative acts come under the definition of critical thinking. Generally, it is accepted that we should view creative and critical thinking holistically and describe them as complementary constructs. Swartz (1987, p. 116) states that "There is danger, though in separating critical thinking from creative thinking, and separating each into sets of skills, then structuring lessons that involve students using these skills piecemeal". Thus, both modes of thinking can be used in combination (Swartz, 1987). For example, when children solve fundamental or divergent movement tasks in as many different ways as possible, they must not only generate alternative ideas (*i.e.*, creative fluency), but also act on those ideas (judgments/critical thinking) using specific criteria to modify and change each movement pattern.

Cleland and Gallahue (1993) studied the divergent movement ability in the psychomotor domain, given the first data for this ability for young children (aged four, six and eight years) to produce divergent motor responses on three fundamental movement tasks. The results of this preliminary study showed that the older children (aged six and eight years) were able to create and produce more movement patterns than the younger children (four years old), and that previous motor experiences were an important factor in determining the divergent movement ability.

Barnett and Kleiber (1982) re-examined Lieberman's aspect (1965, 1977), which supports the idea that most of the cognitive variables associated with play concern the divergent thinking processes of young children. Results were consistent with those found in the original investigation, that is high correlation between the five factors of playfulness and the two of the three dimensions of divergent thinking, fluency and originality.

The present study focused on how far fluency and flexibility in movement patterns' production, as suggestive elements of creative and critical thinking, are related to the variety of psychological constructs that are embodied as a whole in playfulness; that is, the predisposition for play and expression of young children.

METHOD

Subjects

A total of two hundred and fifty children (one hundred and thirty-two girls and one hundred and eighteen boys) participated in this study, which was from eight kindergarten centers. Children's mean age was 5.3 ± 0.4 years and they did not participate in any type of organized physical activity. All of them were Greek, of normal intelligence, and had families where both parents had been continually present since the child's birth. Parents of all children were asked to give parental permission for their children to participate in the study.

Measures

The Children's Playfulness Scale (CPS) (Barnett, 1990) was used by the teachers to evaluate children's behavior. This five-point Likert scale has twenty-three items and was designed to measure the following playfulness factors: physical spontaneity, social spontaneity, cognitive spontaneity, manifest joy and sense of humor. The measurement of playfulness was accomplished by posing statements and asking the rater to respond to each statement by choosing one of five response alternatives, varying from sounds exactly like the child to does not sound at all like the child. The rating for each playfulness factor was determined by summing the ratings given for each item in the factor. The total playfulness rating was achieved by summing the scores in each of the five factors.

The CPS instrument has been shown to be reliable and valid (Barnett, 1990). The Greek version of the CPS was used for this study. It was examined for its construct validity and showed adequate psychometric features (reliability and validity) (Zachopoulou, 2002).

The subject's creative movement was assessed using the Divergent Movement Ability Test (Cleland and Gallahue, 1993), which includes three movement tasks. The first task included four stations. Equipment located in this station was used to elicit a variety of locomotor movement patterns. A second task evaluated the subject's ability to make shapes on, below or beside a padded bench and to execute a variety of stability movements. Manipulating a playground ball nine inches in diameter was evaluated as the third task.

The criterion measures of motor creativity are motor fluency and motor flexibility. Fluency is a dimension of divergent movement since subjects are asked to execute as many movement responses as possible. The second dimension of divergent movement is flexibility since each movement response has to be different from any previous motor response (Barron and Harrington, 1981) and it can be achieved when the movement concepts (space, relationships, etc.) are used to modify fundamental movement skills (Cleland and Gallahue, 1993). Motor fluency was calculated by summing the different responses recorded on score sheets. Each

TABLE I Means and Standard Deviations on the Five Playfulness Factors

Playfulness factors	*Mean*	*Standard deviation*
Physical spontaneity	14.64	3.18
Social spontaneity	11.41	2.58
Cognitive spontaneity	16.61	1.82
Manifest joy	15.75	2.02
Sense of humor	14.26	4.33
Total playfulness	64.82	17.52

different pattern and the variations of these represented "different" responses. If a subject performed a movement pattern that was not a response included on the scoresheet, that different response was added to the subject's scoresheet. Motor flexibility was the number of thematic changes, which means changes in the effort exerted, in the spatial aspect or by changing one's relation to another person or object.

Experimental Procedure

The children's teacher applied the playfulness ratings. The teachers were familiar with the children across a six-month period and the total number of twenty-two teachers were involved in the current procedure. The teachers underwent a sixteen-hour training course on the use of the CPS. This course used videotaped classroom and playground sequences to help instruct the teachers on how to interpret and rate children's playfulness behaviors. Inter-rater reliability among the trained teachers was found to exceed eighty-seven percent.

During the Divergent Movement Ability Test, the presentation order of the three tasks was counterbalanced. Subjects were individually tested and their performance was recorded on videotape for subsequence analysis. The use of videotape rather than live observation helps to ensure accuracy of transcription and inter-observer reliability. The investigator and an assistant were present during all testing. Standardized verbal instructions were given to each subject to familiarize him/her with the testing environment and described what the children should do. Next, the investigator introduced the first task and demonstrated one movement response on the task. Two trials, each lasting 1.5 minutes, were provided for each task. Rest periods of one minute in length were given between each of the trials and rest periods of two minutes between each of the three test tasks. The divergent movement tasks were independently scored twice by two trained observers. Intra-observer and inter-observer agreements were established at eighty-two percent.

RESULTS

Means and standard deviations for the five playfulness factors are depicted in Table I, while means and standard deviations for motor fluency and motor flexibility for the three movement tasks of Divergent Movement Ability Test are presented in Table II.

Inter-correlation coefficients obtained between the three variables, motor fluency, motor flexibility and total playfulness, are presented in Table III. Pearson's coefficient of determination revealed that there was significant correlation between motor fluency and total playfulness ($r = 0.827, p < 0.01$) and between motor flexibility and total playfulness ($r = 0.942, p < 0.01$).

TABLE II Means and Standard Deviations for Motor Fluency and Motor Flexibility for the Three Movement Tasks of the Divergent Movement Ability Test

	Motor fluency		*Motor flexibility*	
	Mean	*Standard deviation*	*Mean*	*Standard deviation*
First movement task	7.67	2.63	15.71	5.35
Second movement task	7.25	2.98	14.51	7.64
Third movement task	3.11	2.81	14.66	7.16
Total	18.03	6.31	44.88	14.04

DISCUSSION

The results of the present study showed that a child who has a high predisposition for play, communication and joy, is also physically creative, meaning fluency in novel and divergent movement patterns or in ideas production. He/she has, namely, a more developed ability in divergent movement, which is a product of creative and critical thinking, according to Cleland (1994). The child who engages in creative processes with fluency and flexibility in ideas and solutions production shows a number of psychological characteristics, such as positive attitude, high physical and cognitive activation, disposition for communication, joy, imagination, curiosity and humor. This supports McBride's (1992) theory, which viewed fluency and flexibility in motor responses as the ability to generate many and various ideas produced from previous experiences, and to elaborate on them critically based on changes of movement elements (space, effort, and relationship) for the planning, the alteration and their final modulation (McBride, 1992). On the other hand, playfulness is an obvious and intrinsic predisposition for play and expressiveness (Barnett, 1990, 1991) that includes a host of characteristics such as imagination, humor, feelings expression, curiosity, novelty-seeking, tolerance and inventiveness (Athey, 1984; Barnett, 1990; Cattel, 1979; Singer and Rummo, 1973).

Participation in structured play, with dramatic elements, exercises for body sensitization and expression feelings and dispositions through movements, showed capabilities for better communication and activation during play (Smith and Connolly, 1972). Singer and Singer (1978), which is in accordance with the opinions of play theorists, underlines that experiences through playful activities and the ability to practice playfulness are a way of developing and completing one's personality. Furthermore, there activities are also a way to confirm and test the reality of things as well as edifying one's knowledge of the world around one.

TABLE III Correlation Matrix of the Measured Variables

Variable	*Motor fluency*	*Motor flexibility*	*Total playfulness*
Motor fluency	1.00		
Motor flexibility	0.671**	1.00	
Total playfulness	0.827**	0.942**	1.00

Note ** Correlation is significant at the 0.01 level.

Other researchers came to the same conclusion, studying mostly figural creativity scores. They found high correlation between playfulness and creativity (Cristie and Johnson, 1983) or divergent thinking performance (Barnetta and Kleiber, 1982; Kogan, 1983; Lieberman, 1965, 1977).

Sutton-Smith (1979) identified the determining role of play for the child pointing to a variety of psychological elements associated with play, including creative thinking. Kogan (1983) stressed the "Linkages between play behaviors and dispositions on the one hand and divergent – thinking performance on the other hand" (p. 72). Cristie and Johnson (1983) reviewed correlational and experimental research from the early 1960s to the 1980s and found a positive relationship between playfulness and creativity. Lieberman (1977) emphasized the importance of playfulness in creative thinking and imagination. Similrarly, Dansky and Silverman (1973) and Berretta and Privette (1990) found that participation in unstructured and symbolic play facilitates divergent thinking in children.

The important point, as the present study showed, is that these two aspects of personality not only appear, act and are connected to play and movement, but are indeed centered around it during these young and crucial preschool ages, where movement is the primary way of acting, expressing, learning, communicating and developing (Gruber, 1986).

As Jones (1972) supported, children have the need for freedom in the selection and execution of different movements. In the same way, it is obvious that children have to acquire a feeling of self-control. Through creative movement, children have the ability to express their feelings and their thoughts, and to act and communicate using their body. This expressiveness, through the body, manifests itself more prevalently than speech. In this way, many children are able to explore, through movement, experiences that were not approachable to them through words.

Movement activities provide children with the ability to exercise and develop their inventiveness, creativity, and their spirit of adventure (Capel, 1986). Thus, a well-organized program can contribute not only to motor skills development, but also to social and emotional development. Movement, in combination with rhythmic and creative exercises and games, offers a balanced program, like that mentioned by Kraft (1986) that included a physical education program containing creative movement activities, with the appropriate teaching method, thus teaching children to use their creative abilities through the exploration of problems and their solutions.

Also useful are indirect teaching styles, creative thinking skills, and critical thinking strategies that, according to Cleland (1994), significantly improved children's ability to generate different movement patterns. These strategies included asking questions, comparing and contrasting solutions, evaluating solutions based on criteria provided by teacher, and analyzing the quality of their movement responses. Its sensitivity to physical education content and teaching styles suggests that if teachers want children to be able to employ creative thinking and critical thinking skills, then they must teach them how to do this. The challenges and the chances for motor skills and ideas discovery are a powerful motive for voluntary participation of children and for cognitive activation, as long as it is of immediate relevance to them. The experience of personal discovery is a catalytic factor for deep and effective learning, and enhances child's self-confidence.

The physical educator has to accept the view that every child, as every person, is by nature creative in accordance with his/her individual characteristics and their current stage of development (Guilford, 1967). What is important is the appropriate teaching method (indirect teaching styles: divergent and convergent methods, exploratory method, step-by-step method) and the organization of a framework with tolerance, acceptance, freedom and safety, situations that are necessary for a creative process. Saracho (2002) supported that teachers can promote the children's creative-thinking capacities by providing an environment that

contributes to their creative-thinking potentials that will or will not flourish in the children's development of creativity. Such an environment can be managed through play, as educators recognize that play provides the best-supported mode for such processes (Bredekamp, 1987). Play provides children the framework where children can train their acquired skills, take new roles, experiment and explore, and solve complex problems that they are not able to solve in other ways (Hughes, 1999). Educators must have as an aim to support development and learning in all children. This can be achieved through the recognition of children's interests and preferences, their personalities, and their talents, skills, their abilities and inabilities.

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