



Comparative Study of Theories Related to Drawing in Pre-primary Students

Dinesh Chand and Dr. Rajendra Kumar Shrimali***

**Department of Education, Singhania University, Jhunjhnu, Rajasthan*

*** Department of Education, Sh Jain Adarshkanya T.T. College, Nokha, Bikaner (Rajasthan).*

(Received 10 August, 2012 Accepted 10 September, 2012)

ABSTRACT

This action research study examined the selection of colour used in eight object drawings of young children. Study sample size consisted of twenty Pre Primary school students from Gyan Sarover Bal Niketan, west Karawal Nagar, Delhi-110094, INDIA. This study was organized into three phases. Each phase asked student participants to draw eight familiar objects (tree, house, boy, dog, girl, car, cat, fan) while limiting the amount of colour selection in each phase. The use of logical colour and expressive colour was investigated and scores were given to each drawing in order to compare logical colour usage. Colour trends were also documented to show possible colour associations in young children's representation of everyday objects. The results found that there was an increase in the use of logical colour as the selection of colour in each phase was minimized. Strong colour trends were shown in the representation of the tree and boy images.

I. INTRODUCTION

An extensive amount of research has been recorded on the topic of children's drawings. Theories regarding the drawings of young children have been established by leading figures in the fields of art education, psychology, and child development. Many past theories that have been generated concerning the development and analysis of children's drawings are pertinent in education today. Three leading researchers in the topic of children's drawings will be discussed in this chapter. Viktor Lowenfeld, Rhoda Kellogg, and Jean Piaget have each contributed to the understanding and appreciation of child development as demonstrated through drawings. The theories established by each researcher will be presented throughout the first section of this chapter.

II. THEORIES

Throughout the course of many decades, there have been various individuals known for their research, analysis, and writings about the development of young children as seen through the drawings they produce. The following three individuals and their theoretical perspectives of children's drawings will be presented: Viktor Lowenfeld, Rhoda Kellogg, and Jean Piaget.

A. First Theory

In the field of art education, Viktor Lowenfeld is well - known for his attention to the importance of children's drawings in determining a progression of developmental levels. He has developed a theory of stages of drawing development which defines appropriate drawing activities according to the age level of children. In his text, *Creative and Mental Growth*, Lowenfeld (1987) outlines these various stages of development and suitable art activities for each stage of personality growth (Kelly, 2004). The stages of artistic development, as referred to by Lowenfeld, consist of the Scribbling Stage (occurring 2 to 4 years of age); Preschematic Stage (4 to 7 years); Schematic Stage (7 to 9 years); Drawing Realism (9 to 12 years); and Pseudo - Realistic Stage (12 to 14 years) (Lowenfeld&Brittain, 1987).

Throughout his text, Lowenfeld (1987) describes his belief that individual self - expression in art promotes cognitive development and personal growth, stressing the importance of encouraging spontaneous self - expression and thus, discouraging the formal teaching of drawing which Lowenfeld believes would inhibit children from using their art

for the purpose of self - expression (Thomas & Silk, 1990). Lowenfeld's model of artistic development also suggests that the personal growth of children is a naturally unfolding process that is constant and cannot be essentially changed (Freedman, 1997). Lowenfeld addresses in his developmental stages the topic of schemas in children's drawings. Freedman (1997) states that Lowenfeld describes schemas as symbolic forms that children make to represent many generic types of objects. Objects such as a person, tree, or flower, for example are popular schemas of children and can be observed in many of their drawings (Freedman, 1997). According to Lowenfeld (1987), schemas are stable concepts that remain constant and unchanging until a child requires another mode of representation, at which time, through experimentation and observation of the environment a new schema will be developed (Freedman, 1997). Until the end of the Preschematic stage (age seven), children will have established schemas and as a result will create drawings with less flexibility (Lowenfeld & Brittain, 1987).

In addition to the development of children's drawings through artistic stages, Lowenfeld also is known for his visual - haptic expressive theory, referring to the mode of perceptual organization and conceptual categorization of the external environment. At age twelve, it becomes possible to see examples of these two types within a child's development (Lowenfeld & Brittain, 1982). According to Lowenfeld (1982), a visually minded person would be classified as one who acquaints himself with his environment through the eyes, whereas a haptic child is one who concerns himself with personal body sensations, experiences, and emotions.

Lowenfeld's artistic stages of development are concerned with children ranging from two to fourteen years of age. In order to focus on the developmental stage which defines the behaviors of the five year old child, the Preschematic Stage (the developmental stage in which Kindergarten - age students are classified) will be presented in detail. Prior to the Preschematic Stage, Lowenfeld (1987) believes that children begin their drawing experience by making random marks on paper until approximately the age of four where recognizable objects begin to appear in their drawings. It is at this time that children make their first recognizable attempts and this occurs until children reach the age of seven (Lowenfeld & Brittain, 1987).

This stage is the beginning of graphic communication where Lowenfeld (1987) indicates a child of high intellectual ability on the basis of detailed drawings which reflect the child's awareness of the world around him. During this stage, the first representational symbol attempted by children is a human/person which consists of a head - feet image (Lowenfeld & Brittain, 1987). According to Lowenfeld (1987), when children make this head - feet representation of a person, they are not trying to copy the environmental world so much as they are drawing the parts that they know and see of themselves. However, this may not be a visual representation at all. Therefore, the first attempts of the drawing of a person should be viewed as an abstraction or schema from a large array of complex stimuli which demonstrates the beginnings of an ordered process. It is not to be looked at as an immature visual representation (Lowenfeld & Brittain, 1987).

An interesting point that Lowenfeld makes reflects a universal view of the child's first drawings of a human. All children make the shapes of a circle to represent the head and two vertical lines representing legs in drawing a person (Lowenfeld & Brittain, 1987). There may be no differences between children of different socioeconomic or cultural influences (Golomb, 1992). On the topic of colour in children's drawings, Lowenfeld (1987) states that there is often little relationship between the colours children select and the objects they attempt to represent and that the conventional use of colour (green grass, blue sky) may not appear in children's drawings until age eight (Schematic stage). According to Lowenfeld (1987), being critical of the use of colour or pointing out the correct or realistic colour for objects would interfere with a child's freedom of expression. Children's use of colour is for colour's sake in which the colour chosen is not for the purpose of imitating subject matter because they do not grasp an exact colour relationship (Lowenfeld & Brittain, 1987). Therefore, children's choice of colour may not be realistic in its imitation of their environment, but rather meaningful and expressive to the individual child. Throughout the Preschematic stage, children are anxious to express themselves in creative ways which may not be characteristic of the manner which adults may deem logical. The drawings that children make in this stage are considered a reflection of their growth and development where children portray relationships and thoughts about the real world (Lowenfeld & Brittain, 1987).

Lowenfeld (1987) states that a child's flexibility and frequent changes in concepts and schemas are vital factors of this developmental stage in which meaningfulness in the subject matter drawn by young children emphasizes the emotional impact of an experience. An emotional reaction to a meaningful experience or object may result in an exaggeration of a particular part of their drawing which focuses on their experience (Lowenfeld & Brittain, 1987). The drawings of children in this developmental stage generally contain images that are perceived as important to the child.

In the Preschematic stage and all of Lowenfeld's stages of artistic development, the emotional, physical, and social growth of the child are evident in the drawings they create. Lowenfeld (1987) describes art and the drawings of

young children as a process. It is through this process that changes in behaviour and growth patterns develop and meaningful changes occur in the products that children make (Lowenfeld & Brittain, 1987).

B. Second Theory

Known for her extensive collection of children's drawings, Rhoda Kellogg has produced a detailed analysis of the shapes and patterns found in the drawings of young children throughout the course of many years (Thomas & Silk, 1990). Her drawing collection contains the products of children ranging in age from approximately two to five years. Although Kellogg studied a large number of drawings, her research is unsystematic and may not clearly define the progressions and orders of complexity of the drawing development of individual children (Thomas & Silk, 1990).

Kellogg (1970) believed that there is a universal pattern of development in the drawings and art of young children. It is suggested by Kellogg (as cited in Thomas & Silk, 1990) that the simple forms and shapes that children make in their drawings can be found in the drawings of children from diverse cultural backgrounds. However, because of a possible lack of clarity in her analysis and system of data collection, the number of examples of children's art from primitive cultures in her collection is unknown (Thomas & Silk, 1990).

Through the process of analysis of children's drawings and art, Kellogg (1970) creates an investigation which focuses on the characteristics of line formations made by children, particularly in the form of scribbling and drawing. Kellogg's (1970) categorizations of line formations are organized into a system of classification in four stages. These four stages cover the period from which the child's first scribbling occurs until approximately age five, a time at which children often create schemas favoured by society (Kellogg, 1970).

The four stages that Kellogg (1970) creates include the Pattern Stage, consisting of the classifications of Basic Scribbles and Placement Patterns; the Shape Stage, containing the Emergent Diagram Shapes and Diagrams classifications; the Design Stage, characteristic of the classifications of Combines, Aggregates, and Balanced Line Formations. The last of Kellogg's four stages, the Pictorial Stage, includes the classifications of Humans and Early Pictorialism (Kellogg, 1970). Each stage and its classifications of line formations will be discussed in further detail in order to show Kellogg's theory of an evolving progression of child growth through drawing.

The first of Kellogg's four stages is the Pattern Stage, a self-taught stage which begins as early as two years of age (Kellogg, 1970). In this stage, Kellogg (1970) addresses the classifications of Basic Scribbles and Placement Patterns. During the period of Basic Scribbles, Kellogg (1970) believes that the visual interest in the simple act of scribbling is an essential component to a child's acquisition of line making capability. There are twenty types of markings each demonstrating movements of variations of muscular tension that do not require visual guidance (Kellogg, 1970). Kellogg (1970) views these twenty basic scribbles as the building blocks of art, important because they permit a detailed and comprehensive description of the work of young children. A child has the ability at age three or four to place a single type of scribble on one piece of paper comprised of spontaneous movements with or without eye control (Kellogg, 1970). This action, according to Kellogg (1970) may demonstrate a child's progression of visual awareness. The earliest evidence that Kellogg (1970) has found of controlled shaping in children's work is during the period of Placement Patterns. When children's markings progress to this classification, they contain their scribbles into a designated space or frame requiring control of the eye to position markings in relation to the edge of the paper (Kellogg, 1970). Occurring by the age of two, Placement Patterns suggest purposeful circles, rectangles, triangles, squares, arches, and various odd shapes (Kellogg, 1970).

The Shape Stage, the second of Kellogg's (1970) four stages, is also a self-taught stage which includes the classifications of Emergent Diagram Shapes and Diagrams. When children are engaged in the classification of Emergent Diagram Shapes (between the ages of two and three), they make marks that consist of single lines employed to form crosses and to outline circles, triangles, and other shapes (Kellogg, 1970). Kellogg (1970) considers this stage as emerging because it provides a transition between the Pattern Stage and the Diagram classification. Developmentally, the Diagrams indicate a child's increasing ability to make controlled lines and employ memory (Kellogg, 1970). In opposition to Basic Scribbles, Placement Patterns, and Emergent Diagram Shapes in which a child's markings are spontaneous and visually stimulating, the Diagrams are evidence of a child's first planning and deliberation of a drawing activity (Kellogg, 1970).

The third stage that Kellogg (1970) distinguishes is the Design Stage, consisting of children between the ages of three and four. Included in this stage are the classifications of Combines, Aggregates, and the Balanced Line Formations of Mandalas, Suns, and Radials (Kellogg, 1970). The Combines are essentially units of two Diagrams in which identifiable circles, squares, triangles, and crosses gradually become irregular and undifferentiated forms (Kellogg, 1970). Combines are created as a result of these shapes and forms becoming superimposed onto another (Thomas & Silk, 1990). Kellogg (1970) refers to Aggregates as larger numbers of scribbles that lie in close proximity (Thomas & Silk, 1990). When a child begins to form Aggregates, Kellogg (1970) believes he begins to function as an artist with a repertory of visual ideas. There is an infinite amount of possible Aggregates and the

characteristic of line formations (bold, subtle, simple, intricate, large, small) can be attributed to the child's attention span occurring at the time of the markings (Kellogg, 1970).

In addition to the Combines and Aggregates that a child creates during the Design Stage, Kellogg's (1970) Balanced Line Formations of Mandalas, Suns, and Radials are significant to the progression of development throughout this stage. The Mandalas, a Sanskrit word for circle, are often Combines that are formed of a circle or square that are divided into quarters by a cross (Kellogg, 1970). This is a frequently occurring Combine that Kellogg (1970) considers inherently pleasing to children (Thomas & Silk, 1990). Kellogg (1970) states that Mandalas are essential not only as a part of the sequence of child art development, but also because they are a link between the art of children and the art of adults. Suns are characteristic of linear lines that form marks moving from the center or outline of the circle, resembling the rays of a sun and, although simple in structure, do not appear before the child has drawn complex Aggregates (Kellogg, 1970). A Radial formation is one with lines that radiate from a point or small area in a shape which can influence the placement of arms and legs in a Human drawing, occurring next in the progression of developmental stages (Kellogg, 1970).

The remaining stage in Kellogg's stages of child art development is the Pictorial Stage which, according to Kellogg (1970) occurs when children enter the age of four and continues throughout their early childhood years. Included in this stage are the classifications of Humans and Early Pictorialism containing the images of animals, buildings, vegetation, and other subjects (Kellogg, 1970). Kellogg (1970) suggests that the way in which the child combines the Scribbles and the Diagrams determines a particular appearance to the Human image and to all subsequent pictorialism. When the first Human is made, the child joins the face Aggregate with the body parts that from a modified Mandala. The details of hands, feet, and hair show clearly that aesthetics outweighs realism in child art with each mark distinguishing its own story (Kellogg, 1970).

The transfiguration of the Human into the horizontal Animal becomes effective for the four and five year old child (Kellogg, 1970). According to Kellogg (1970), this is the time in which Early Pictorialism would begin to occur and may be grouped into the categories of Animals, Buildings, Vegetation, and Transportation. Kellogg (1970) believes that at this stage five year old drawings are not as pure as nursery school age children because of the influence of school and formal art lessons in providing formulas for copying which lessens the 'purity' of their work. It is to be noted that Kellogg's studies occurred during the decade of the fifties where school art lessons had an impact on the creative development of the young child. In today's society, art education in the early childhood years encourages creativity and models art lessons according to the developmental needs of young individuals.

Kellogg remains consistent in utilizing her classifications in the Early Pictorial images children make. Kellogg (1970) states that Buildings are drawn by combining Diagrams in various ways, not as a result of observing houses on the street. In addition, it is observed by Kellogg (1970) that Buildings or Houses made by children are drawn similarly all over the world, supporting a universal approach to child art development. The popular Vegetation images drawn by children are Trees and Flowers, in which Kellogg's classifications of Scribbles, Diagrams, Combines, Aggregates, Mandalas, Suns, and Radials are all evident. According to Kellogg (1970), Flowers, Trees, and Transportation drawings (boats, cars, trains, airplanes) are not drawn in sizes found in nature or the external world, but in sizes needed to complete Patterns or to achieve aesthetic goals. Transportation images, consisting of Combines and Aggregates, are also made in combination with other classifications in representation of the objects (Kellogg, 1970).

Throughout Kellogg's four stages of child development in art and their subsequent classifications, progression of growth in children ages two to five can be determined through the building and combination of marks. Kellogg (1970) believes that the child relies on the basic shapes of art and arranges them in relation to one another to pictorialize objects and scenes. Like Lowenfeld's model, Kellogg's theory of drawing development corresponds to the belief that children's growth and development cannot be changed because it is a naturally unfolding process (Freedman, 1997).

C. Third Theory

Jean Piaget has dominated for many the world of developmental and cognitive theories of children (Kelly, 2004). Piaget has conducted an extensive amount of research and has created many approaches and explanations of the progression of social, emotional, and cognitive growth in children. On the topic of child development in art, for Piaget, children's drawings were interesting only as a support to his own stage theory of child development (Kelly, 2004). Because there is no distinct analysis of children's drawings made by Piaget (Thomas & Silk, 1990), his cognitive theory of development presents a theoretical approach of child development through drawing.

Piaget's stages of cognitive development are based on maturation and age of the child (Kelly, 2004). The growth of intelligence in childhood progresses through a series of stages which are determined by the age of the child (Thomas

& Silk, 1990). In Piaget's system of cognitive development, learning from experiences in the external world plays a significant role in the development of a child's cognitive ability (Kelly, 2004).

Piaget's theory of cognitive development can be described by attributing the interpretation of an experience by a child. Piaget believed that the environment of children is received by assimilation or accommodation. Through assimilation, the preconceptions of the child are used to understand new stimuli, whereas the accommodation requires an adjustment to these new stimuli (Thomas & Silk, 1990). The process of assimilation occurs when a child utilizes his prior knowledge when confronted with a new experience. The child then addresses this new experience and adapts accordingly. The action of assimilating or accommodating to a situation or experience can be a determining factor in a child's development. In the natural way of things, the young child is faced with accommodating to an external world which he may slightly understand. It becomes necessary for there to be an area of activity that is not externally constraining which also provides opportunities for assimilation (Thomas & Silk, 1990).

As stated by Piaget (1969), play is the core activity involving assimilation. Piaget regarded the early scribbles of the very young child as being pure play (Thomas & Silk, 1990). In addition to the act of scribbling, Piaget (1969) considered the early scribbles of young children as exercise. From the progression of scribble making to the onset of drawing images, the activity of recreating personally important incidents would also serve as an assimilative function (Thomas & Silk, 1990).

Piaget's view that cognitive development proceeds through a series of distinct stages led him to adopt the classification of stages in children's drawings. Piaget's theory of children's drawing development, originally proposed by Luquet in 1913, is classified by organizational and graphic skills of the child as well as the child's realistic intentions (Thomas & Silk, 1990). Piaget's theory focused on the idea that cognitive development occurs throughout a set of sequenced universal stages. These stages are influenced by the chronological age in which the child attains each state (Newton & Kantner, 1997). The child is assumed to progress throughout the drawing stages as he matures cognitively in his development.

Piaget used drawing as evidence in his theory of the child attempting to create a representation of the real world (Thomas & Silk, 1990). A child's drawing was centralized around mental images and the understanding of space (Piaget & Inhelder, 1967). Piaget assigned to drawing a level of status positioned between symbolic play and mental images. Although Piaget occasionally utilized the drawings of young children to illustrate his theory, studies of drawings were never central in his theory development (Thomas & Silk, 1990).

Piaget proposed that children's drawings were essentially realistic in intention and that the child intended to produce a representation of an object in a recognizable and realistic fashion (Thomas & Silk, 1990). The colour usage, shapes, and formation of lines used in the drawings and images of children can be attributed to an attempt to create a true representation of the real world, as opposed to an expressive interpretation. The drawings of young children classified as schematic and unorganized are associated with an inability to construct precise relations to space between objects (Reith, 1997).

Because Piaget (as cited by Thomas & Silk, 1990) believed that children as they advance chronologically in age will mature in their cognitive ability, drawing instruction was not deemed a necessary tool. A child's maturation in age will result in a mental image which is more developmentally advanced as opposed to formal instruction of drawing techniques to create a similar outcome (Thomas & Silk, 1990).

Piaget's theory of drawing development parallels his theory of cognitive development with the basis of age and maturation predicting the outcomes and products created by the child. As Piaget attributes the drawings of young children as a developmental process, it can be noted that it is a progression from stages determined by chronological age in addition to a child's ability to assimilate and accommodate to new stimuli in the real world. Although children's drawings were beneficial only to Piaget in sustaining his own theory of child development (Kelly, 2004), his theory supports a succession of sequential stages which contribute to the overall understanding of the child's intellectual growth and development.

III. RELATING THREE THEORETICAL PERSPECTIVES

Within the theories presented by Viktor Lowenfeld, Rhoda Kellogg, and Jean Piaget on the topic of child development through drawing, there has surfaced commonalities as well as differences in the theoretical perspectives proposed by each theorist. Although each shares the belief in the importance of children's drawings in predicting the development of the child, Lowenfeld, Kellogg, and Piaget each have established models of analyzing the products of children with the intended purpose of determining the growth and progression of the child. Each theorist attributes different characteristics and trends in the images young children make to distinguish a level of attainment of cognitive and behavioral status. Comparisons will be made in the developmental theories of Lowenfeld, Kellogg, and Piaget in order to relate three theoretical perspectives.

On the topic of proposing a developmental theory of drawing for young children, it can be assumed that both Lowenfeld and Kellogg began their process with the collection and analysis of children's drawings. Inclusions of illustrations from sample child images gave clear definitions and examples of their stages of child art development. Kellogg's approach to the analysis of children's drawings may be deemed unsystematic in nature (Thomas & Silk, 1990). However, it is evident from her text that the drawings from her collection are included and adequately labeled. Lowenfeld, in addition to Kellogg, has referenced the images produced by children in his studies throughout his text. Piaget, although interested in children's drawings, may lack concrete evidence in the collection and analysis of specific elements in the drawings of young children in support of his theory.

Evident throughout each theory presented by Lowenfeld, Kellogg, and Piaget is their common perspective on a universal trend in the development of young children as seen through their drawings. Each theorist states that children develop in similar ways throughout the course of their young lives through experiences and chronological order.

As children develop and progress through stages, there is a sequence of universal patterns that can be observed in the images that young children make. Although each theorist may distinguish different possibilities for growth to occur, it can be concluded that the progression and images that children make are universal in outcome and product. It is interesting to note that there is a distinct contrast between the self - expressive theory of Lowenfeld and that of Piaget's cognitive theory of development. Where Lowenfeld (1987) believes that children create drawings that are inherently important and reflect their desire to express their experiences and emotions, Piaget proposes that the drawings children make are the product of an intentional effort to represent realistic images (Thomas & Silk, 1990). Regardless of which theory proves this assumption, both theories consider the progression of a young child's drawing in migrating from the stage where this occurs to a stage characteristic of their continued growth.

Because the theories of Lowenfeld, Kellogg, and Piaget became popularized during similar times, it can be assumed that each theorist was familiar with and possibly influenced by the beliefs and findings of the others. This particularly lies true for Rhoda Kellogg in reference to Viktor Lowenfeld's (1982) visual - haptic expressive theory. Kellogg (1970) states in her text, *Analyzing Children's Art*, that her primary objection to Lowenfeld's categories is that the haptic and visual aspects of art cannot be separated meaningfully. Kellogg (1970) continues by stating that the haptic aspects which are considered by Lowenfeld as subjective may be in fact found in child art universally, as well as the visual aspects.

In relating the three theoretical perspectives presented by Viktor Lowenfeld, Rhoda Kellogg, and Jean Piaget, it becomes apparent that there are commonalities and differences worth noting between the theories proposed by each. Although there are many current theories concerned with the development of children through drawing and art, these three theorists have created solid and reputable foundations and ideas that some consider valid and true in a society separated from their time by decades. Lowenfeld, Kellogg, and Piaget have influenced the field of education, art, and child development through their distinct theories of children's drawings and development.

Based on the literature in the field of child development through art as presented by Lowenfeld, Kellogg, and Piaget, assumptions made as to the outcomes of colour selection in the drawings of young children are as follows:

- Kindergarten-age children will make expressive colour choices rather than logical colour choices in the drawings they create.
- In relation to gender, girls would use more expressive colour choices than boys.
- Logical colour choices would increase with age.
- Students with a higher level of academic ability would use more logical colour choices.

Students with a higher economic status would use more logical colour choices.

IV. CONCLUSION

The topics of children's drawings and colour studies in young children were presented in order to address these issues as they relate to colour selection in the drawings of young children. Pertaining to the subject of children's drawings, three distinct individuals and their respective theories each provided an understanding of child development through the analysis of children's drawings. Recent studies conducted with young children relevant to colour preference, colour - emotion relationships, and colour choice in object representations were presented in order to examine findings and common colour trends in young children. The results of the studies presented established possible assumptions for the colours children choose according to emotional preferences and/or symbolic associations in representing objects.

REFERENCE

- Gardner, H. (1980). *Artful scribbles: This significance of children's drawings*. New York: Basic Books.
- Gardner, H. (1990). *Art education and human development*. Los Angeles: Getty Center for Education in the Arts.

- Colomb, C. (1981), Representation and reality: The origins and determinants of young children's drawings. *Review of Research in Visual Arts Education*, **14**, 36-48.
- Kellogg, R. (1970), *Analyzing children's art*, Palo Alto, Cal.: Mayfield.
- Lowenfeld, V. & Brittain, W.L. (1982). *Creative and mental growth* (7thed.) New York: Macmillan.
- Lowenfeld, V. & Brittain W.L. (1987). *Creative and mental growth* (8thed). New Jersey; Prentice- Hall.
- Meerum Terwogt, M. & Hoeksma, J.B. (1995). Color and emotions: preferences and combinations: *Journal of Genetic Psychology*, **122**(1), 5-17
- Melkman, R. Koriat A., & Pardo, K. (1976). Preference for color and form in preschoolers as related to color and from differentiation. *Child Development*, **47**, 1045-1050.
- Piaget, J. & Inhelder, B. (1967). *The child's conception of space*. New York: w.w. Norton
- Piaget, J. (1969). *The mechanisms of perception*. New York: Basic Book.
- Piaget, J. & Inhelder, B. (1971) *Mental imagery in the child* New York: Basic books. Pitchford, N.J. & Mullen, K.T. (2001). Conceptualization of perceptual attributes: special case for color :*Journal of experimental Child Psychology*, **80**, 289-314.