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Strategies for Depicting Space in Drawings by Children Aged 4 to 6 Years

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Abstract

In the study, we monitored ways of interpreting space in drawings by children at the age of 4 to 6 years. We sought to determine the strategies of space interpretation in the target group. The research aimed to deepen our understanding of development in the depiction of space and thereby influence the development of the artistic didactics for those of preschool age. The overall research sample included eight hundred and seven children. The survey found that children between the ages of 4 and 6 mostly depict space in the top-bottom relation, that the rendering of space at the level of 3D is almost non-existent, with non-observance of space still quite present, but that the earlier modes decline, while more complex ones are developing. We also found that gender differences in spatial distribution do not occur within this age group. We also sought to enable the field of art pedagogy to develop new didactic principles and approaches based on the results.

Key words: *artistic development; drawing; pedagogy; preschool child.*

Introduction

Survival of living beings depends on successful adaptation to the environment and knowledge of the laws governing it. Perception and understanding of the environment begin with the child's birth and are most intensively developed in the preschool stage. "It is perfectly true that such a sensory-motor space begins to evolve right from the child´s birth, and together with perception and motor activity it undergoes considerable development up until the appearance of speech and symbolic images" (Piaget & Inhelder, 1971, p. 3). Although Piaget has been criticised in relation to the stage-led, progressive nature of children's drawings (MacRae, 2008; Cox, 1991; Golomb, 1992), preschool artistic didactics, at least in part, still takes into account his model of the development and understanding of space in the preschool child, while considering other aspects.

Piaget closely linked cognitive development with the development of drawing and regarded children's early pictorial work as evidence of their cognitive deficit (Kindler, 2004, pp. 237-238) despite Freeman's (1995, acc. to Kindler, 2004, p. 238) suggestion that it was not the lack of knowledge about the world, but rather of the ability to translate it to a drawing.

The child perceives space with the senses, primarily with sight, hearing and touch. Art educational science is interested in visible and tactile impressions and analyses of the child's symbolic images. By means of vision, the child becomes acquainted with shapes, light, light-dark relationships, shadows, colours and the relationships between them, and of course, with the three-dimensionality of space, its height, width and depth (Arnheim, 2009). For the survival of the human being, the perception of forms is more important than perception of and distinguishing between colours (Trstenjak, 1978), and the perception of space is of vital importance. Living in a three-dimensional Euclidean space requires an understanding of the complex laws that govern it.

Spatial intelligence (Gardner, 1997), with which the child tackles the understanding of space, is an inseparable part of the child's general logical development. The child's development of perceptions and the understanding of space can be intensively monitored after about two years of age through the study of artistic expression. Children's artistic expression, especially at the preschool stage, is an "expression of our search for order in a complex world, as examples of communication, as indices of the type of society we live in, as signs of intellectual development" (Goodnow, 1977, p. 10). Developmental psychology and fine pedagogy define the stages in the development of three-dimensional space rendering.

Development of space rendering

The problem of rendering space is as old as humankind. From the first cave paintings fifty thousand years ago, humans have faced the same problem as every child in his or her artistic expression. The artistic expression is primarily flat and takes place on a two-dimensional surface (Matthews, 2004), a rock, a canvas or a sheet of paper, and on this two-dimensional surface are depicted scenes from a world of three dimensions.

How to depict depth on a two-dimensional plane is a question pondered by former civilizations and that still concerns the preschool child today. Not only in the problem but also in its solutions, phylogeny is repeated in ontogeny. "We find striking analogies to children´s art in the early stages of so called primitive art all over the world" (Arnheim, 2009, p. 162). When displaying space in certain segments, children use the same principles that we recognise from the prehistory of fine arts. The ancient Egyptians used a vertical perspective when displaying space. What was more distant in space was higher on the plane, what was closer appeared lower down. There were three representations, and five or more strips or layers. Arnheim (2009) calls the similarities between the method of past civilizations and children's techniques the Egyptian method. The development of artistic expression is carried out according to

a model, which is at least partially true for the method of depicting space. "Children draw in predictable ways, going through fairly definite stages, starting with the first marks on paper and progressing through adolescence" (Lowenfeld & Brittain 1970, pp. 25-26, acc. to Atkinson, 2009, p. 140). The development in the depiction of space was defined by Lowenfeld and Brittain (1970), Piaget and Inhelder (1948; 1971), Goodnow (1977), Arnheim (2009), Belamarić (1987), Tanay (1988), Karlavaris (1991), Karlavaris and Berce Golob (1991), Grgurić and Jakubin (1996), Zupančič (2001), Duh and Zupančič (2003), Barnes (2015), etc. At the beginning of artistic expression, around the age of two, children do not take into account or imitate space, or the relations and circumstances that rule it. "Awareness of space is often confused in young children´s mind and they may solve problems by working all round their paper … so we have no firm idea of where the top and bottom of the room is" (Barnes, 2015, p. 35). This most elemental form of (non)imaging of space is called a conglomerate (Gerlovič & Gregorač, 1976; Tanay, 1988; Karlavaris, 1991). At this stage, space and its components in the child's artwork are not defined. All depicted elements are scattered around the page. Based on what is not visible below and what is above (Matthews, 2004; Gerlovič & Gregorač, 1976), children attribute the same importance to all edges of the art space: they have not yet established relationships to the centre of gravity (Karlavaris, 1991). While creating art, they constantly turn the sheet in different directions. As a result, elements in the conglomerate are scattered around the art space and can be turned in all directions (Tanay, 1988). This stage shows a lack of preoperational thinking, which is the understanding of space. It is not unusual for a child to have floating figures, or no ground for their figures. If they do have a ground, the figures might not be on it. The images may appear random in their placement, but may have an emotional content that the child is expressing (Stolley, 2012, p. 12).

The conglomerate represents the first of the nine criteria for depicting space in the analysis of artworks in the empirical part of our study.

Figure 1. The elemental form of space - a conglomerate (A; girl, 3y8m) and defined format (B; girl, 3y11m)

The defined format

The defined format is the next level. In the understanding and rendering of space, it does not represent a qualitatively higher level, since the objects are still scattered across the plot and turned in all directions, but they are all inside an outlined square. This

is mostly adapted to the boundaries of the substrate. Children first draw a frame of the format in which they are articulated (Tanay, 1988). The appearance of a rectangle, in which the child draws objects and persons, often acts as a house without a front wall and occurs in later stages of development, except that at that time all figures are equally oriented vertically. This phenomenon is known as X-ray pictures. "A child may wish to express the total concept of a structure that has an outside and an inside" (Hickman, 2010, p. 18). "The drawing of the house is neither a transparent view nor a section. It is the two-dimensional equivalent of a house" (Arnheim, 2009, p. 200). The appearance of the defined format was used as the second criterion in the study.

Base line

The appearance of the floor line represents the first beginning of spatial orientation in the child's drawing. The child perceives a two-dimensional surface on which he/she draws as a symbolic art space (Muhovič, 1990), and on this surface the child indicates only what is below and what is above, but does not try to depict the third dimension: depth. This appears in the middle of the figurative phase (Lowenfeld & Brittain, 1987) when children begin to see the relationship between things in the environment and themselves; this is indicated by the use of a ´base line´; things may stand on the bottom edge of the page, or on a drawn line (Hickman, 2010, p. 16).

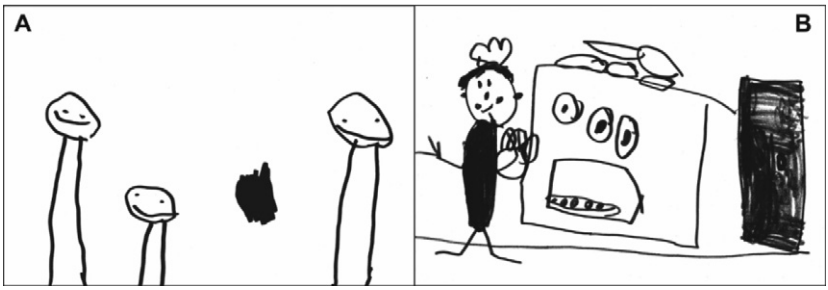

Figure 2. The bottom line is the edge of the paper (A; boy, 4y2m) and groundline is drawn (B; boy, 4y6m)

The bottom line is the edge of the paper

Within a certain period of time, children begin to place the elements on the lower edge of the sheet. This represents a floor line and separates the surface of the floor from the background surface. As a rule, children put on the floor line those elements that are placed on the floor even in their actual surroundings. In addition, children can draw elements (persons, objects) even above the ground line (such elements float in the air). This may indicate a wish to fill the surface (Gerlovič & Gregorač, 1976) or a feeling that they lack enough space on the ground floor. It is important that from this moment all the drawn elements are oriented in the same vertical axis. The basic definition of the space, top-bottom, is given, and depth is not yet present. "Nothing distinguishes at first between depthlessness and depth, or between a flat object and

a voluminous one. The spatial qualities of a dinner plate are treated no differently from those of a football" (Arnheim, 2009, p. 199). We used this phenomenon as the third criterion.

Groundline drawn

This phenomenon is the same as above, except that the depiction of the space is not based on the lower edge of the paper; instead, the children draw a floor line. This horizontal line is drawn a centimetre or so above the lower edge of the format and is parallel to it. The motifs placed on the floor are now attached to the drawn floor line, but there are still people or objects that, although in the same vertical orientation to the top and bottom, float in the air. We used this phenomenon as the fourth criterion.

Base line is the bottom edge of the paper, plus a skyline

This criterion is a sub-stage of the elementary vertical plane orientation. In this case, children emphasize their understanding of the spatial orientation below-above by adding a line of the sky below the upper edge of the paper (Hickman, 2010). This never touches the floor line (Gerlovič & Gregorač, 1976); there is an empty space between the floor line and the line of the sky. Children create a line of the sky with different motifs. They represent the sun, the clouds, the sky, snowflakes, raindrops, the moon, and the stars. If they draw, for example, the interior of a house, most often there are ceiling lamps (Schrader, 2000). We used this phenomenon as the fifth criterion.

Figure 3. Base line is the bottom edge of the paper, plus skyline (A; girl, 5y2m) and base line and the line of the sky (B; girl, 4y2m)

The base line and the line of the sky

This is similar to the above, in that the children emphasize their vertical orientation in the space by drawing themselves both a floor line and a line for the sky. We used this phenomenon as the sixth criterion.

For criteria three to six, this is the same way of imaging spatial relationships in the child's symbolic art space. All these levels fall into the part designated the "horizontal-vertical stage" by Arnheim (2009, p. 207). The space is understood as a flat plane. The child realizes depth in the real space, while still drawing on the principle of flatness (2D). The space perception is topological (Piaget & Inhelder, 1971). The top-bottom orientation prevailing in the preschool period was divided into the subgroups described in the study.

Vertical perspective, base line repetition (elevation)

Although the children still perceive space in the relationship below and above, in their artwork, there is now a desire to refer to the third dimension. They are aware that in their own spatial relations, they are somewhat closer to real space, while others are farther away. Because they still perceive their symbolic art space, they invent the Egyptian method (Arnheim, 2009). They draw several horizontal floor lines on the surface. The objects in the foreground are drawn at the lower part of the drawing, while more distant objects are drawn above these (Hickman, 2010; Bodulić, 1982). Above is used to mean behind, and below means in front (Freeman et al., 1977). We say that children divide the drawing into individual layers and depict the forms one above the other (Grgurić & Jakubin, 1996). We used this phenomenon as the seventh criterion.

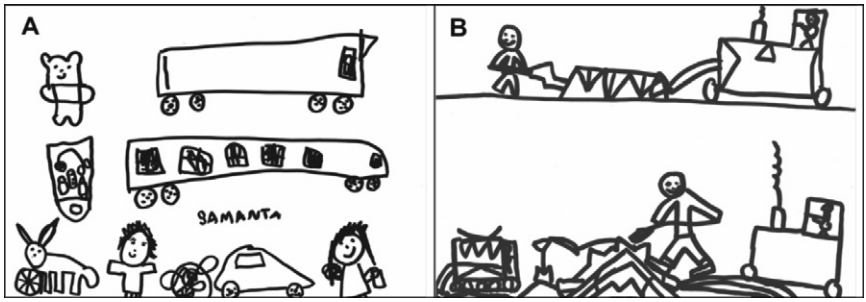

Figure 4. Vertical perspective base line repetition/ vertical space, elevation (A; boy, 5y5m, B; boy, 5y0m)

Horizontal space

At about five or six years of age, children begin to show space according to the principle of maximum clarity. Objects are painted on the surface so that they are all visible and do not overlap. Children want to display each form in its entirety; they do not want to reduce or have overlap, so they lay out the shapes on the paper (Karlavaris, 1991). Because of this, the objects are depicted in such a way as to give the impression that the children are looking from different perspectives, and the drawing acts as a ground plan. "We must remember that at this age (5-6 years) to teach perspective would be inappropriate as perception of space is unlikely to be as we experience it as adults" (Barnes, 2015, p. 35). Arheim (2009) found the following:

> As long as the two-dimensional view is not differentiated from the projective view, the flat pictorial plane serves to represent them both. This can be done in two ways. The child can use the vertical dimension of his picture plane to distinguish between top and bottom and the horizontal for right and left and thus obtain "vertical space" (elevation). Or he can use two dimensions to show the directions of the compass in a ground plan, which produces "horizontal space". (p. 202)

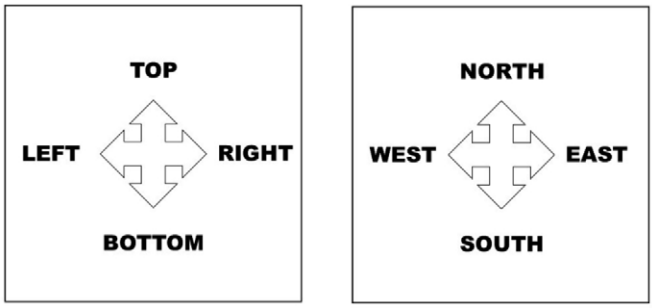

Figure 5. Vertical and horizontal orientation in children's drawing (Arnheim, 2009, p. 203)

The emergence of horizontal space means a maximum qualitative leap in the perception of space in the child's drawing in the preschool period. The difference in children's perception of the surface on which he/she draws as a 2D or 3D space is given in Figure 5. The appearance of the horizontal space was used as the eighth survey criterion.

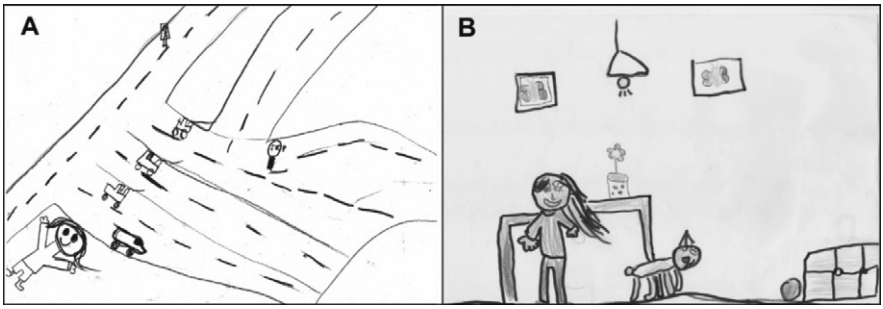

Figure 6. Horizontal space (A; girl, 6y8m) and partial overlapping (B; girl, 6y5m)

Partial overlapping

At this stage, children display space in a way that the drawn elements partially overlap (Hickman, 2010). The space and relations between different objects are illustrated in such a way that objects lying closer can partially overlap more distant objects (Grgurić & Jakubin, 1996). This is a consequence of the child's visual impressions of the environment. Piaget and Inhelder (1971) called this stage Visual Tealism, "when finally appears a type of drawing which endeavours to take perspective, proportions and distance into account all at one" (Piaget & Inhelder, 1971, p. 52). Partial overlap is the first true attempt to translate three-dimensional laws to a two-dimensional surface. For the previous stages, it is true that "nothing distinguishes at first between depthlessness and depth, or between a flat object and a voluminous one" (Arnheim, 2009, p. 199).

However, even though partial overlapping already indicates spatial relations in the third dimension, the depth does not yet represent the child's understanding of the

complexity of Euclidean space. "On the other hand, in the case of Euclidean relationships, it is obvious that intellectual realism marks the appearance of straight lines, angles, circles, squares and other simple geometrical figures, though naturally without any exact measurements or proportions" (Piaget & Inhelder, 1971, p. 51). Although this phenomenon is placed by experts at the age of seven or eight years (Piaget & Inhelder 1971; Grgurić & Jakubin 1996; Karlavaris 1991), it does occasionally appear in drawings by younger children. That is why we used it as the last, ninth criterion in the research. The stages in the development of space drawing that were used in the study are shown in Table 1.

Table 1
Developmental stages for spatial representation in children´s drawings

Stage Name	Description	Top-Bottom Relation
Conglomerate	No space depiction, objects are drawn on and out of the paper	No top-bottom definition
Format definition	Depiction of format boundaries, objects are placed inside drawn boundaries	No top-bottom definition
Base line is the bottom edge of the page	Objects are standing on the lower edge of the paper	Top-bottom definition
Base line is drawn	Objects are standing on the drawn base line	Top-bottom definition
Base line is the bottom edge of the page, plus the sky line	Objects are standing on the lower edge of the paper, the sky line on the top of the page is drawn	Top-bottom definition
Base line is drawn, plus the sky line	Objects are standing on the drawn base line, the sky line on the top of the page is drawn	Top-bottom definition
Vertical space, vertical perspective; base line repetition (The Egyptian method)	Double or multiple base line representing foreground and background	Top-bottom definition
Horizontal space	Ground plan drawing	No top-bottom definition
Partial overlapping	Foreground objects overlapping objects in the background	No top-bottom definition

Methods of rendering space that appear after the sixth or seventh year were not included in the study. In children´s work of the late figurative phase, we might see attempts to depict three-dimensional space, with representations of distant objects being made smaller; the sky is usually filled in to the horizon instead of being a strip of colour at the top of the page (Hickman, 2010, p. 10).

Definition of the research problem

In the study, we monitored ways of interpreting space in children aged 4 to 6 years. We chose this period because it is when the child begins symbolic artistic rendering.

This means that the child's drawing can be used for the research purpose of studying the rendering of space. The child begins to express himself artistically before, around the second year of age, but scribbling becomes the dominant activity between the ages of 2 and 4 (Barnes, 2015, p. 31). Even if children create a figural figure during this period, it is characterized by "synthetic incapability" (Luquet 1927, acc. to Piaget & Inhelder, 1971, p. 46). "One of the principal features of synthetic incapability is that parts of figures are simply juxtaposed instead of being continuously linked together" (Piaget & Inhelder, 1971, p. 49). Piaget and Inhelder call the stage between the ages of 4 and 6 "Intellectual realism" (Piaget & Inhelder, 1971, p. 49). This is a period "which consists in drawing not what the child actually sees of the object … but everything that is there … Here we have a schema that is in part deliberate and undoubtedly systematic and lasting" (Piaget & Inhelder, 1971, p. 50). After six years of age, the perception and rendering of space changes (it passes into other phases). "Real projection begins to be grasped (after 7-8 years) precisely at the point where pseudo-rotation characteristic of the period of intellectual realism begins to disappear" (Piaget & Inhelder, 1971, p. 51). During this period, teachers also observe the first decline of interest in artistic expression. "Around the age of 7, or even earlier, children can become dissatisfied with the symbolic drawings which they have done and are likely to say that they cannot draw properly" (Barnes, 2015, p. 24). "Toward the age of 8 and 9, on the average, there finally appears a type of drawing which endeavours to take perspective, proportions and distance into account all at once" (Piaget & Inhelder, 1971, p. 52).

The purpose of the research was to determine the strategies for space interpretation in a target group of children aged between 4 and 6. Different interpretations of space show how children perceive space in distinct ways. This is conditioned by the age of the children and by individual specifics in the artistic development of the child. The study aimed to deepen our understanding of the development of the depiction of space and thereby to influence the development of artistic didactics for preschoolers.

Research questions and hypotheses

The following research questions with regard to the sample, i.e. children aged 4-6 years, were set in this study:

RQ1 – Is the representation of space in the relation between the bottom and the top predominant (the edge of the paper, the floor line, the edge of the sheet and the line of the sky, the floor line and the line of the sky)?

RQ2 – Does the rendering of space that involves dealing with the third dimension (vertical perspective and partial overlapping) appear to a lesser extent than other modes?

RQ3 – Does the disregard of spatial relationships (conglomerate, defined space) no longer occur?

RQ4 – Do elementary ways of rendering space (conglomerate and defined format) decrease?

RQ5 – Can it be argued that certain degrees represent lower levels when developing space in the relation between the bottom and the top (the edge of the sheet, floor line,

the edge of the sheet and the sky line, the floor line and the sky line), while others have a higher developmental rate?

RQ6 – Is it correct to predict that more complex ways of imaging space (vertical perspective, and partial overlap) increase at the researched age?

The following hypotheses were formulated in the study:

H1 – There are statistically significant differences between individual ways of depicting space according to age in children of 4 to 6 years old.

H2 – There are no statistically significant differences in the representation of space at the age of 4–5 between girls and boys.

H3 – There are no statistically significant differences in the representation of space at the age of 5–6 years between girls and boys.

Research methods

Respondents

The sample in the survey comprised children aged 4 to 6 years. Eight hundred and seven children were included in the whole sample.

Table 2
Presentation of the sample by gender

Gender	F	f %	Cumulative %
boys	402	49.8	49.8
girls	405	50.2	100.0
Total	807	100.0	

In Table 2, we see that the sample was balanced with regard to gender. The sample was further subdivided into eight age groups. The structure of the sample is presented in Table 3.

Table 3
Presentation of the sample by gender

Age Year-month	f	f %	Cumulative %
4.0-4.3	96	11.9	11.9
4.3-4.6	105	13.0	24.9
4.6-4.9	90	11.2	36.1
4.9-5.0	108	13.4	49.4
5.0-5.3	79	9,8	59.2
5.3-5.6	102	12.6	71.9
5.6-5.9	114	14.1	86.0
5.9-6.0	113	14.0	100.0
Total	807	100,0	

From Table 3, it can be seen that we grouped children by age into three-month groups. Each subgroup included at least 79 children, up to 114 at the most. Children aged 4-5 make up 49.4 % of the sample, and children aged 5-6 years, 50.6 %. The sample is also age-balanced.

Data collection

We acquired the artistic input from the children during the study process, that is, during the pedagogical practice of students at the Faculty of Education, University of Maribor, in the academic years 2016/17 and 2017/18. Children in kindergartens were given the task of drawing themselves playing in the room. The drawings were created under test conditions. The children were provided with A4 paper and something to draw with (pen or pencil).

Data processing procedures

The children's works were evaluated in terms of how they depicted space and relationships therein. In line with the theoretical starting points, we produced a nine-degree scale for the rendering of space (Table 1). The nine stages were as follows: (1) conglomerate, or non-accommodating space, (2) a defined format, (3) the edge of the sheet, (4) the floor line, (5) the edge of the sheet and a line for the sky, (6) the floor line and the line of the sky, (7) base line repetition, (8) horizontal space and (9) partial overlap.

In each piece of art, we determined the dominant way of imaging space. The works of art were evaluated by an expert team of three art teachers and researchers with several years of practice. The data were processed with the SPSS statistical package.

In this research, we followed ethics in all its aspects, namely: voluntary participation in the survey, information about the research, protection of the individual's identity, confidentiality and privacy, and respect for the truth.

Results and interpretation

Interpretation of the rendering of space from the perspective of the whole sample

Table 4

Frequency distribution of the entire sample according to space interpretation

Space Interpretation	f	f %	Cumulative %
Conglomerate	107	13.3	13.3
Format definition	83	10.3	23.5
Base line is the bottom edge of the page	225	27.9	51.4
Base line is drawn	110	13.6	65.1
Base line is the bottom edge of the page, plus the sky line	121	15.0	80.0
Base line is drawn, plus the sky line	112	13.9	93.9
Base line repetition	39	4.8	98.8
Horizontal space	5	0.6	99.4
Partial overlap	5	0.6	100.0
Total	807	100.0	

We first analysed the methods of spatial depiction for the whole sample. We found that the third method prevailed, that is, drawing on the lower edge of the sheet (27.9 %). This way of depicting space illustrates the child's perception of space in the

above – below relation. The following three most common methods of rendering space (the floor line, the edge of the paper and the line of the sky, the floor line and the line of the sky) illustrate the same perception of spatial relationships (top-bottom), but the relationship below-above is depicted in a slightly more sophisticated way. As can be seen from Table 4, there are four top-bottom modes of space rendering, for a total of 70.9 %. On this basis we can confirm the first assumption (RQ1): the perception and rendering of space in relation between the bottom and the top prevails at ages between the fourth and the sixth year, and that the problem of the third dimension is not dealt with.

Furthermore, we found that only 6 % of the drawings appear in the drawing space where the child tries to depict the third dimension (base line repetition, horizontal space, partial overlap) (Table 4). We can confirm the second assumption (RQ2): at the age of 4-6 years, the problem of the third dimension appears to a lesser extent.

It was a surprise that in 23.5 % of the drawings, the space was not indicated even in the top-bottom relation (conglomerate, format definition). We assumed that the drawing mode where the paper is turned in different directions would not appear in this age period (RQ3). We supposed that after the age of four, children are led by an inner voice telling them to portray what they are already aware of; however, it is obviously not so. This is attributed to the various developmental dynamics of individuals and, at least partially, to the appearance of fine arts (Lowenfeld & Brittain, 1987; Karlavaris, 1991; Duh & Zupančič, 2003). In general, there are two different types of learners: visual and haptic. The visual child is concerned with light and shade, tries to represent three-dimensional space, concentrates on the whole rather than on details, and is analytical in approach. The haptic child is more emotional, gives space significance only if it is necessary for the expression of emotions, and concentrates on detail (Hickman, 2010, p. 19).

We cannot confirm the assumption that the disregard of spatial relationships no longer appears (RQ3) in children aged 4-6 years.

Interpretation of space rendering from the perspective of children's age

In the second part of the interpretation, the sample was divided internally into four age groups. In the first group, the children were between 4 years and 4 years and 6 months; in the second from 4 years and 6 months to 5 years old; in the third between 5 years and 5 years and 6 months; and in the last, children were 5 years and 6 months to 6 years old. Methods for interpreting space among a particular group of children are presented in Table 5.

Table 5
Frequency distribution of space interpretation with respect to individual age groups of children.

Space Interpretation	Frequency	Age				
		4.0 – 4.6	4.6 – 5.0	5.0 -5.6	5.6 – 6.0	Total
Conglomerate	F	63	27	10	7	107
	f %	31.3 %	13.6 %	5.5 %	3.1 %	13.3 %
	$\bar{R}$	7,50	5,50	2,75	2,25	
	K-W test		$\chi 2$= 6,114		P= 0,106	
Format definition	F	25	25	14	19	83
	f %	12.4 %	12.6 %	7.7 %	8.4 %	10.3 %
	$\bar{R}$	6,00	5,00	3,50	3,50	
	K-W test		$\chi 2$ =1,500		P= 0,682	
Base line is the bottom edge of the page	F	64	57	41	63	225
	f %	31.8 %	28.8 %	22.7 %	27.8 %	27.9 %
	$\bar{R}$	6,00	4,25	2,00	5,75	
	K-W test		$\chi 2$= 3,416		P= 0,332	
Base line is drawn	F	19	28	31	32	110
	f %	95 %	14.1 %	17.1 %	14.1 %	13.6 %
	$\bar{R}$	1,75	5,25	5,25	5,75	
	K-W test		$\chi 2$= 3,500		P= 0,321	
Base line is the bottom edge of the page, plus the sky line	F	14	36	30	41	121
	f %	7.0 %	18.2 %	16.6 %	18.1 %	15.0 %
	$\bar{R}$	1,50	5,50	4,00	7,00	
	K-W test		$\chi 2$= 5,775		P= 0,123	
Base line is drawn, plus the sky line	F	13	16	41	42	112
	f %	6.5 %	8.1 %	22.7 %	18.5 %	13.9 %
	$\bar{R}$	2,25	2,75	6,50	6,50	
	K-W test		$\chi 2$= 5,440		P= 0,142	
Base line repetition	F	3	8	12	16	39
	f %	1.5 %	4.0 %	6.6 %	7.0 %	4.8 %
	$\bar{R}$	2,25	4,00	5,75	6,00	
	K-W test		$\chi 2$=3,116		P=0,374	
Horizontal space	F	0	1	2	2	5
	f %	0.0 %	0.5 %	1.1 %	0.9 %	0.6 %
	$\bar{R}$	2,50	4,25	5,25	6,00	
	K-W test		$\chi 2$=2,750		P= 0,034	
Partial overlapping	F	0	∪	0	5	5
	f %	0.0 %	0.0 %	0.0 %	2.2 %	0.6 %
	$\bar{R}$	4,00	4,00	4,00	6,00	
	K-W test		$\chi 2$=3,000		P= 0,392	
Total	F	201	198	181	227	807
	f %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

We assumed that the elementary methods for rendering space (conglomerate and defined format) would decrease in the period between 4 and 6 years. The data in Table 5 confirm this. The percentage of conglomerate or undefined space decreased with age from 31.3 % to 13.6 %, then to 5.5 %, and finally to 3.1 %. Results are similar for another elementary criterion, the defined format (12.4 %, 12.6 %, 7.7 % and 8.4 %), although the downward trend here is smaller. Although in the previous table (Table 3) we found that non-alignment of space continues to occur to a considerable extent at the ages of 4 to 6 (23.5 %), we can confirm the assumption (RQ4) that the elementary methods of rendering space (conglomerate and defined format) do decline in the period between 4 and 6 years old.

The most common methods for depicting space in this period, which illustrate the child's perception of space at the bottom-top level (edge of the page, the floor line, edge of the page and the skyline, the floor line and the skyline) show an interesting profile in Table 4. The rendering of space by drawing on the edge of the page is present in similar percentages throughout all four age sub-periods. Similarly, the method of drawing a floor line, while rendering the edge of the sheet and the skyline, and the floor lines and the skyline, is becoming more common. On this basis, we can answer research question five (RQ5) and argue that in the methods of rendering below and above, drawing on the edge of the paper represents an earlier stage, while rendering the floor line joined by the skyline indicates a higher level of development.

More complex modes of space imaging (vertical perspective and partial overlap) are present in very small percentages, and their use occurs only in older subgroups. We assumed that more complex ways of imaging space (vertical perspective and partial overlap) would increase in the period between 4 and 6 years of age. This is true, but in Table 4, we see that the differences between the appearance of different methods of drawing space relative to age are not statistically significant. The assumption that more complex ways of rendering space are increasing (RQ6) is therefore neither confirmed nor discarded. However, on the basis of Kruskal-Wallis tests, we can discard the hypothesis (H1) that the differences in the methods of rendering space relative to age are statistically significant.

Based on the interpretation of the data in Table 5, we found that at the age of 4-6 years, spatial deposition rates do not develop linearly from earlier to later and more complex. We see the reason for this in the next stage of the argument. It is true that phases in depicting space develop in accordance with the child's intellectual development, but in artistic expression to a degree greater than can be explained by developmental stages. Atkinson (2009) refers to this fact, emphasising that:

> metaphor "stages" evoked a picture which suggested that children´s drawing developed incrementally from simple to complex forms … However, when thinking about the universe of a child´s experience, is it the case that children possess an overwhelming interest or desire to represent objects in space from a fixed viewpoint? Such a representation is only concerned with a particular

> experiential orientation within an entire universe of experience. For other experiential orientations – such as fantasizing, map making, relations between objects, playing games, describing action sequences – to be articulated, they will require appropriate representational forms. Furthermore, the variety of such experiences will invoke different cognitive, affective and conative drives which will inform the drawing process. (p. 140)

Given that by the age of 4-6, even though to a minor extent, more complex methods of rendering space do appear, we can confirm: "It is nevertheless possible to see that intellectual realism constitutes a type of spatial representation in which Euclidean and projective relations are just beginning to emerge, though as yet in an inchoate form with respect to their interconnections" (Piaget & Inhelder, 1971, p. 50).

Interpretation of spatial depiction from the perspective of gender at the age of 4-5 years

In determining the gender effect, the sample was divided into two age groups. We decided based on the results review. The first group consisted of children between the ages of 4 and 5, and the second group included children aged between 5 and 6 years.

Table 6
Frequency distribution of space interpretation by gender in children aged 4-5 years

Space interpretation		Gender 4 - 5 years		Total
		Boys	Girls	
Conglomerate	f	55	35	90
	f %	25.2 %	19.3 %	22.6 %
	$\bar{R}$	5,38	3,63	
	M-W test		U= 4,500 P = 0,309	
Format definition	f	29	21	50
	f %	13.3 %	11.6 %	12.5 %
	$\bar{R}$	4,88	4,13	
	M-W test		U= 6,500 P = 0,661	
Base line is the bottom edge of the page	f	62	59	121
	f %	28.4 %	32.6 %	30.3 %
	$\bar{R}$	4,5	4,5	
	M-W test		U=8,000 P = 1,000	
Base line is drawn	f	28	19	47
	f %	12.8 %	10.5 %	11.8 %
	$\bar{R}$	5,50	3,50	
	M-W test		U= 4,000 P = 0,245	
Base line is the bottom edge of the page, plus the sky line	f	25	25	50
	f %	11.5 %	13.8 %	12.5 %
	$\bar{R}$	4,25	4,75	
	M-W test		U= 7,000 P = 0,769	

Space interpretation		Gender 4 - 5 years		Total
		Boys	Girls	
Base line is drawn, plus the sky line	f	12	17	29
	f %	5.5 %	9.4 %	7.3 %
	$\bar{R}$	3,75	5,25	
	M-W test	U= 5,000 P = 0,378		
Base line repetition	f	6	5	11
	f %	2.8 %	2.8 %	2.8 %
	$\bar{R}$	5,50	3,50	
	M-W test	U= 4,000 P = 0,231		
Horizontal space	f	1	0	1
	f %	0.5 %	0.0 %	0.3 %
	$\bar{R}$	5,00	4,00	
	M-W test	U= 6,000 P = 0,0,317		
Total	f	218	181	399
	f %	100.0 %	100.0 %	100.0 %

In Table 6, we see that, at the age of 4-5 years, the representation of the space is mainly made in both sexes by drawing on the lower edge of the page (28.4 %, 32.6 %). The conglomerate is followed by both genders (22.2 %, 19.3 %). Since this is a younger age group of half the sample, growth in the conglomerate method could be expected; however, a fairly large percentage of children surprised us by not adapting in their visual artwork or elemental form. If we look at the conglomerate together with the defined format, we find that at least 35.1 % of children were using the top-bottom relationship. The appearance of other methods for rendering space is similar in both genders (the defined format is 13.3 %, 11.6 %; the floor line is 12.8 %, 10.5 %; the edge of the page and the sky line is 11.5 %, 13.8 %; the bottom line and the line of the sky 5.5 %, 9.4 %, and the air perspective for both sexes 2.8 %). In this period, horizontal space occurs only in one child. The results of Mann-Whitney tests in table 6 also show that gender differences are not statistically significant, which means that there are findings for both genders of a large percentage of non-matching of space and almost zero occurrence of higher forms of aggregation at the ages between 4-5 years. The hypothesis (H2) can thus be confirmed.

Interpretation of the depiction of space from the perspective of gender at the age of 5-6 years

In Table 7, we see that at the age of 5-6 years, as at the age of 4-5 years, the rendering of space by drawing on the lower edge of the paper dominates in both sexes (22.3 %, 28.1 %). In the case of boys, the second line is followed by a linear line and a line of the sky (20.7 %), while it is the edge of the paper and the line of the sky in girls (21.4 %). The drawing of the floor line (17.4 %) is in the third place for boys, while for girls, third is a line for the bottom line and a line for the sky (20.1 %). Other modes

Table 7
Frequency distribution of space interpretation by gender in children aged 5-6 years

Space interpretation		Gender 5 - 6 years		Total
		Boys	Girls	
Conglomerate	f	10	7	17
	f %	5.4 %	3.1 %	4.2 %
	$\bar{R}$	5,00	4,00	
	M-W test		U= 6,000 P = 0,559	
Format definition	f	26	7	33
	f %	14.1 %	3.1 %	8.1 %
	$\bar{R}$	6,13	2,88	
	M-W test		U= 1,500 P = 0,058	
Base line is the bottom edge of the page	f	41	63	104
	f %	22.3 %	28.1 %	25.5 %
	$\bar{R}$	3,25	5,75	
	M-W test		U= 3,000 P = 0,144	
Base line is drawn	f	32	31	63
	f %	17.4 %	13.8 %	15.4 %
	$\bar{R}$	4,50	4,50	
	M-W test		U= 8,000 P = 1,000	
Base line is the bottom edge of the page, plus the sky line	f	23	48	71
	f %	12.5 %	21.4 %	17.4 %
	$\bar{R}$	2,50	6,50	
	M-W test		U= 0,000 P = 0,017	
Base line is drawn, plus the sky line	f	38	45	83
	f %	20.7 %	20.1 %	20.3 %
	$\bar{R}$	3,75	5,25	
	M-W test		U= 5,000 P = 0,384	
Base line repetition	f	12	16	28
	f %	6.5 %	7.1 %	6.9 %
	$\bar{R}$	4,00	5,00	
	M-W test		U= 6,000 P = 0,554	
Horizontal space	f	2	2	4
	f %	1.1 %	0.9 %	1.0 %
	$\bar{R}$	4,50	4,50	
	M-W test		U= 8,000 P = 1,000	
Partial overlapping	f	0	5	5
	f %	0.0 %	2.2 %	1.2 %
	$\bar{R}$	4,00	5,00	
	M-W test		U= 6,000 P = 0,317	
Total		184	224	408

appear to a lesser extent. Compared to the age of 4-5 years, the conglomerate appears in a small percentage (5.4 %, 3.1 %), which is expected. During the experiments in three-dimensional rendering at this age, a vertical perspective (6.55, 7.1 %) appears to a slightly higher degree, the least common of which is the spin and partial overlap. The results of Mann-Whitney tests in table 7 show that gender differences are not statistically significant. The H3 hypothesis can therefore be confirmed.

By comparing the results in Tables 5 and 6, we found the following: the influence of gender on space rendering increases with age. In children under the age of five, gender does not play a prominent role, but the role of gender becomes more important between the ages of five and six. This is at least partly attributed to the fact that girls and boys, as they age, increasingly differentiate themselves in terms of interests, game modes, motivation for work and distinct developmental dynamics. In Table 7, we can see that major deviations between spatial representation patterns in terms of gender occur in the form of lower incidence of the definition format (boys 14.1 %, girls 3.1 %) and in the highest-performing mode, i.e. partial overlapping (boys 0.0 %, girls 2.2 %). We found that the first criterion, conglomerate as a complete non-representation of space, is declining in both boys and girls. The second criterion, the format definition, decreases as the age of the girls decreases. Moreover, in boys 5-6 years old, compared to those of 4-5 years, it has an even slightly higher percentage (13.3 % - 14.1 %). The ranking criteria for the top-bottom relation appear in a similar number for both genders and both ages. For the last criterion in top-bottom relation, base line repetition was observed in both genders by age (boys 4-5 years - 2.8 %, girls 4-5 years - 2.8 %, boys 5-6 years - 6, 5 %, girls 5-6 years - 7,1 %). Given that the last criterion, partial overlapping, does not appear at all among those aged 4 to 5 years, we can conclude that the more complex 3D modelling is based on developmental conditions and begins to appear to a greater extent only at the end of the sixth year.

Conclusion

The study of the development of visual expression, as carried out in our research, helps us to understand those cognitive processes in the child that are reflected in her art productions. The survey found that children aged 4-6 years mostly depict space in a top-bottom relation, 3D space rendering is almost non-existent, non-observance of space is still quite present, but also that the earlier modes decline, while more complex ones increase. We also found that gender differences in spatial distribution occur with age; we did not detect these in children between 4 and 5 years of age, but we did detected them in children at the ages of 5 to 6.

The results of the research have attempted to further clarify certain aspects of the development of artistic expression. At the same time, we have enabled the field of art pedagogy to develop new didactic principles and approaches based on our results. It is also true that the child's development takes place automatically and, according to certain models, it does not progress to the next step when it is maturing. As Hickiman claims:

> What is apparent is that children's artistic development is a complex process of interaction between children's growing awareness of themselves and their environment. The importance of recognising this is that children who do not receive support, direction and guidance are disadvantaged; development might well occur without adult 'interference', but potential will be unrealised. (p. 20)

Finally, we would like to emphasize that it is difficult to interpret a child's artistic development in a uniform and linear manner. Certain theoretically supported findings were confirmed, some of which appeared in a new light, and some were merely touched on. Contemporary art didactics must take into account different aspects in studying the child's drawing, which has been shown through research. For example, it is necessary to consider the influence of artistic types (Lowenfeld & Brittain, 1987; Karlavaris, 1991; Duh & Zupančič, 2003) on the child's expression.

Art educators should also consider the importance of the learning context in early art activities (Matthews, 1999), as well as cultural contexts (Cox, 1998), socio-cultural approaches (Scott Frisch, 2006) and others. The cognitive approach used in the research is just one of them. We also did not get into the creative processes, which could also be one of the viewpoints, especially as an important part of the primary school curricula (Zupančič, 2020).

Nevertheless, with detailed insight into what is currently happening in children's cognitive development, how they perceive space, how they conceptualise it and present themselves, we can encourage, guide and further foster this development with appropriate pedagogical influences.

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Strategije prikazivanja prostora u likovnim djelima djece u dobi od četiri do šest godina

Sažetak

U istraživanju smo pratili načine izražavanja prostora na crtežima djece u dobi od 4 do 6 godina. Nastojali smo odrediti strategije interpretacije prostora u ciljnoj grupi. Cilj istraživanja bio je produbiti naše razumijevanje razvoja dječjega prikaza prostora i time utjecati na razvoj likovne metodike predškolske dobi. Istraživanje je provedeno na uzorku od osamsto sedam djece. Istraživanje je pokazalo kako djeca u dobi od 4 do 6 godina uglavnom prikazuju prostor u odnosu gore-dolje. Također je utvrđeno da prikazivanje prostora na razini 3D prikaza gotovo i ne postoji. Djeca uglavnom ne pokazuju interes za prikazivanjem prostora u svojim crtežima, razvojno raniji modusi prikaza prostora nestaju, dok se složeniji razvijaju. Također smo otkrili da nema statistički značajne razlike u prikazivanju prostora u ovoj dobi s obzirom na spol. Uz to, na području likovne pedagogije pokušali smo razviti nova didaktička načela i pristupe koji se temelje na rezultatima statističkih analiza.

Ključne riječi: *crtanje; dijete predšolske dobi; pedagogija; umjetnički razvoj.*

Uvod

Opstanak živih bića ovisi od uspješnoga prilagođivanja na okoliš i poznavanju prirodnih zakona koji u tom okolišu vladaju. Percepcija i razumijevanje okoline započinje rođenjem i najintenzivnije se razvija u predškolskom razdoblju. „Potpuno je točno da senzorno-motorički razvoj počinje s djetetovim rođenjem, a zajedno s percepcijom i motoričkom aktivnošću prolazi kroz značajan razvoj sve do pojave govora i simboličkih slika" (Piaget i Inhelder, 1971, str. 3). Iako je kritiziran Piagetov stav o progresivnosti razvoja dječjega crtanja (MacRae, 2008; Cox, 1991; Golomb, 1992), predškolska likovna didaktika bar djelomično još uvijek uvažava njegov model razvoja i razumijevanja prostora kod djece predškolske dobi, naravno uz uvažavanje i drugih aspekata.

Piaget je usko povezao kognitivni razvoj s razvojem crteža i rani likovni rad djece smatrao dokazom njihova kognitivnoga deficita (Kindler, 2004, str. 237-238), dok Freeman (1995, pema Kindler, 2004, str. 238) dodaje da se u tom primjeru ne radi o nedostatku znanja o svijetu, već nedostatku sposobnosti da se to prevede u crtež.

Dijete doživljava prostor osjetilima, prvenstveno vidom, sluhom i opipom. Likovno-pedagoška struka proučava vizualne i taktilne dojmove i analizira dječje simboličke slike. Kroz vid dijete se upoznaje s oblicima, svjetlošću, svijetlo-tamnim odnosima, sjenama, bojama i odnosima između svih njih te naravno s trodimenzionalnošću prostora, visinom, širinom i dubinom (Arnheim, 2009). Kao što je percepcija oblika za opstanak čovjeka važnija od percepcije i razlikovanja boja (Trstenjak, 1978), tako je i percepcija prostora od vitalne važnosti. Život u trodimenzionalnom euklidskom prostoru zahtijeva razumijevanje složenih zakona koji vladaju u tom prostoru.

Prostorna inteligencija (Gardner, 1997), pomoću koje dijete razumijeva prostor, sastavni je dio djetetova cjelokupnoga logičkog razvoja. Razvoj percepcije i razumijevanja prostora može se intenzivno pratiti kod djeteta nakon otprilike druge godine života pomoću proučavanja njegova likovnoga izražavanja. Dječji likovni izraz, posebno u predškolskom razdoblju, jest „izražavanje naše čežnje za redom u složenom svijetu, način komunikacije, pokazatelj društva u kojem živimo i znak intelektualnog razvoja." (Goodnow, 1977, str. 10). Razvojna psihologija i likovna pedagogija određuju faze u razvoju prikaza trodimenzionalnoga prostora.

Razvoj prikazivanja prostora

Problem likovnoga prikazivanja prostora star je koliko i čovječanstvo. Još od prvih pećinskih slika prije pedeset i više tisuća godina, čovjek se suočavao s istim problemom s kojim se suočava svako dijete u svojem likovnom razvoju. Vizualni izraz prvenstveno je dvodimenzionalan i nalazi se na dvodimenzionalnoj površini (Matthews, 2004) na stijeni, platnu ili papiru, dok su na toj dvodimenzionalnoj površini prikazani prizori iz svijeta koji ima tri dimenzije.

Pitanje kako prikazati treću dimenziju, dubinu na dvodimenzionalnoj površini pitanje je koje je zanimalo prošle civilizacije i koje još danas zanima svako predškolsko dijete. Ne samo u problemu, već i u njegovim rješenjima, filogenija se ponavlja u ontogenezi. „Možemo uočiti zapanjujuće analogije između dječjega likovnog rada u ranim fazama s takozvanom primitivnom umjetnošću u cijelom svijetu." (Arnheim, 2009, str. 162). Kod prikazivanja prostora, djeca se u određenim segmentima koriste istim načelima koja poznajemo iz pretpovijesti likovne umjetnosti. Drevni Egipćani koristili su vertikalnu perspektivu pri prikazivanju dubine. Ono što je bilo u 3D prostoru dalje, prikazano je više na 2D površini, a ono što je bilo bliže, niže. Prikazi su imali tri, a poneki put i pet ili više traka ili slojeva. Arnheim (2009) naziva sličnosti između izražavanja prostora prošlih civilizacija i djece egipatska metoda.

Razvoj dječjega likovnog izraza slijedi model koji se barem dijelom odnosi na načine kako dijete prikazuje prostor. „Djeca crtaju na predvidljive načine, prolazeći kroz prilično određene faze, počevši od prvih šara na papiru napredujući kroz sljedeće faze razvoja" (Lowenfeld i Brittain 1970, str. 25-26, prema Atkinson, 2009, str. 140). Faze razvoja prikaza prostora kod djeteta definirali su Lowenfeld in Brittain (1970), Piaget in Inhelder (1948, 1971), Goodnow (1977), Arnheim (2009), Belamarić (1987), Tanay

(1988), Karlavaris (1991), Karlavaris i Berce Golob (1991), Grgurič i Jakubin (1996), Zupančič (2001), Duh i Zupančič (2003), Barnes (2015) i dr.

Na početku likovnoga izražavanja, oko druge godine života, dijete ne uzima u obzir prostor i ne prikazuje odnose i datosti koji u njemu vladaju. „Percepcija prostora kod male djece često je zbunjena i zato oni crtaju radeći po cijelom papiru / ... /, tako da ne možemo ustanoviti, gdje se nalazi vrh a gdje dno crteža." (Barnes, 2015, str. 35). Ovaj najelementarniji oblik (ne)prikazivanja prostora naziva se konglomerat (Gerlovič i Gregorač, 1976; Tanay, 1988; Karlavaris, 1991). U ovoj fazi prostor i njegove komponente u dječjem likovnom radu nisu definirani. Svi prikazani elementi rasuti su po cijelom prostoru. Na crtežu nije vidljivo što je dolje, a što gore (Matthews, 2004, Gerlovič i Gregorač, 1976), djeca pridaju isto značenje svim rubovima crtačke površine, odnos prema središtu gravitacije još nije uspostavljen (Karlavaris, 1991). Tijekom likovnoga stvaranja neprestano okreću podlogu u različitim smjerovima. Kao rezultat toga, elementi u konglomeratu razbacani su po čitavom umjetničkom prostoru i mogu se okretati u svim smjerovima (Tanay, 1988).

Ova faza pokazuje nedostatak predoperativnoga razmišljanja (*preoperational thinking*), koji podrazumijeva razumijevanje prostora. Nije neobično da dijete crta plutajuće figure ili ne crta tla za svoje figure. Ako ipak nacrta tlo, figure možda nisu na njemu. Figure mogu izgledati slučajno u njihovoj poziciji na plohi, ali usto mogu izražavati emocionalni stav djeteta. (Stolley, 2012, str. 12). Konglomerat predstavlja prvi od devet kriterija prikaza prostora u analizi likovnih radova u empirijskom dijelu našega istraživanja.

Slika 1.

Definiran format

Definiran format sljedeća je faza u razvoju dječjega prikaza prostora. U razumijevanju i prikazivanju prostora definiran format ne predstavlja višu razinu s obzirom na pitanje kvalitete, jer su objekti još uvijek raštrkani po površini i pozicionirani u različitim smjerovima prema tlu, ali se zato svi nalaze unutar ocrtanoga kvadrata. Taj se uglavnom prilagođava granicama podloge. Djeca prvo nacrtaju okvir formata unutar kojeg se likovno izražavaju (Tanay, 1988). Izgled pravokutnika, unutar kojeg dijete crta predmete i osobe, često djeluje kao kuća bez prednjeg zida i također se pojavljuje u kasnijim fazama razvoja, osim što su tada svi likovi okomito jednako orijentirani. Fenomen je poznat kao rendgenska slika. S tim „dijete možda želi izraziti cjelokupni koncept ili strukturu koja ima vanjštinu i unutrašnjost" (Hickman, 2010, str. 18). „Crtež kuće nije ni prozirni pogled ni presjek. To je dvodimenzionalni ekvivalent kuće" (Arnheim, 2009, str. 200). Kao drugi kriterij u istraživanju korišten je fenomen definiranoga formata.

Linija tla

Crtanje linije tla ili poda predstavlja prvi početak prostorne orijentacije na dječjem crtežu. Dvodimenzionalnu površinu na kojoj dijete crta doživljava kao simbolički

likovni prostor (Muhovič, 1990), u kojem označava ono što je dolje/ispod i ono što je gore/iznad, a ne pokušava prikazati treću dimenziju - dubinu. Taj stupanj pojavljuje se usred figurativne faze (Lowenfeld i Brittain, 1987) kada djeca počinju uviđati odnose između stvari u okolini na jednoj strani i sebe na drugoj, na taj proces ukazuje i crtanje „osnovne linije" – predmeti i figure mogu stajati na donjem rubu papira ili na nacrtanoj horizontalnoj crti (Hickman, 2010, str. 16).

Slika 2.

Rub papira označava liniju tla

U određenoj fazi razvoja djeca počinju crtati elemente na donjem rubu papira. To predstavlja liniju tla i stvara razliku između površine poda i pozadine. Djeca u pravilu nižu na tlo one elemente koji stoje na tlu i u okolini koja ih okružuje. Uz to, djeca mogu crtati elemente (osobe, predmete) također iznad linije tla (takvi elementi lebde u zraku). Time možda žele ispuniti prazan prostor (Gerlovič i Gregorač, 1976) ili im nedostaje mjesta na samoj liniji tla. Važno je da su od ovoga trenutka svi nacrtani elementi orijentirani u istoj vertikalnoj osi. S tim je usvojena osnovna definicija prostora gore-dolje, od vrha do dna, ali još se ne pojavljuje dubina prostora. „Ništa u početku ne razlikuje između ravnosti (plošnost, crtanje u 2D???) i dubine, niti između ravnog predmeta i obimnog. Prostorne kvalitete tanjura ne iskazuju se na drugačiji način od lopte." (Arnheim, 2009, str. 199). Ovaj smo fenomen koristili kao treći kriterij.

Linija tla podignuta s ruba papira

Taj je fenomen u prikazu prostora isti kao i ranije opisani, osim što oznaka prostora ne predstavlja donji rub papira, već djeca nacrtaju horizontalnu crtu. Ta crta povučena je centimetar ili dva iznad donjega ruba formata papira s kojim je paralelna. Motivi smješteni na tlu sada se nižu na nacrtanoj liniji poda, ali još uvijek ima figura ili predmeta koji, inače u istoj vertikalnoj orijentaciji gore i dolje, lebde u zraku. Ovaj smo fenomen koristili kao četvrti kriterij.

Rub papira označava liniju tla, pored nje je linija neba

Ovaj je kriterij također podrazina elementarne orijentacije gore-dolje. U ovom slučaju djeca naglašavaju svoje razumijevanje prostorne orijentacije odozdo prema gore dodavanjem linije neba ispod gornjega ruba lista (Hickman, 2010). Linija neba nikada ne dodiruje liniju tla (Gerlovič i Gregorač, 1976), uvijek postoji prazan prostor između linije poda i linije neba. Djeca stvaraju liniju neba s različitim motivima. Prikazuju sunce, oblake, nebo, pahulje, kišne kapi, mjesec i zvijezde. Ako crtaju unutrašnjost kuće, najčešće se pojavljuju stropne svjetiljke (Schrader, 2000). Taj smo fenomen koristili kao peti kriterij.

Slika 3.

Linija tla podignuta s ruba papira i linija neba

Ovaj način prikaza prostora kod djece sličan je ranije navedenom opisu prostora jer u ovom slučaju djeca naglašavaju svoju vertikalnu (gore-dolje) orijentaciju u prostoru crtajući i liniju poda i liniju neba. Taj smo fenomen koristili kao šesti kriterij.

Kriteriji tri do šest predstavljaju isti način prikazivanja prostornih odnosa u dječjem simboličkom likovnom prostoru. Sve gore spomenute faze pripadaju dijelu koji Arnheim (2009, str. 207) naziva „vodoravno-okomitim stupnjem". Prostor je zamišljen kao ravni. Dijete je svjesno dubine u stvarnom prostoru, ali i dalje radi na principu ravnosti (2D) prilikom crtanja. Dijete topološki percipira prostor (Piaget i Inhelder, 1971). Gornji kriteriji orijentacije, koji prevladavaju u predškolskom razdoblju, u podskupine podijeljeni su za namjene istraživanja.

Vertikalna perspektiva, repeticija linije tla

Iako djeca još uvijek percipiraju prostor u odnosu gore-dolje, sada u njihovim likovnim radovima postoji želja da prikažu i treću dimenziju. Svjesni su da je u odnosu na njih u stvarnom prostoru nešto bliže, a drugo dalje. Budući da svoj simbolički likovni prostor još uvijek percipiraju plošno, izumili su egipatsku metodu (Arnheim, 2009). Na papiru nacrtaju nekoliko horizontalnih linija tla. Na dnu papira crtaju predmete koji se nalaze u prvom planu, koji su djetetu najbliže, a iznad njih crtaju one, koji su udaljeniji (Hickman, 2010; Bodulić, 1982). Gore znači iza, a dolje znači sprijeda (Freeman, Eiser i Sayers, 1977). Kažemo da djeca dijele crtež u pojedinačne slojeve i slažu oblike jedan iznad drugoga (Grgurić i Jakubin, 1996). Taj smo fenomen koristili kao sedmi kriterij.

Slika 4.

Prevaljivanje oblika

Između pete i šeste godine djeca počinju pokazivati prostor prema principu maksimalne jasnoće. Crtaju predmete okrenute naopako tako da su vidljivi sa svih strana i da se ne preklapaju. Djeca žele svaki oblik prikazati u cjelini, ne žele ga smanjivati ili preklapati, pa zato rastavljaju motive na ravnoj plohi (Karlavaris, 1991). Zbog toga su predmeti prikazani tako, da stvaraju dojam promatranja iz različitih perspektiva, a crtež djeluje kao tlocrt. „Ovdje moramo naglasiti da bi u ovoj dobi (5-6 godina) poučavanje perspektive bilo neprimjereno jer percepcija prostora kod djeteta nije jednaka percepciji prostora kod odraslog čovjeka" (Barnes, 2015, str. 35).

„Dokle god dvodimenzionalni izgled nije diferenciran od projektivnoga izgleda, čista ravan slike služi da predstavlja oboje. Ovo može učiniti na dva načina. Dijete može koristiti vertikalnu dimenziju svoje ravne slike da bi napravilo razliku između gore i dolje, horizontalno za desno i lijevo, i time dobije „vertikalni prostor" (elevaciju, izgled). Ili pak može da upotrijebi svoje dvije dimenzije za prikaz smjera kompasa u tlocrtu, koji stvara "horizontalni prostor" (Arnheim, 2009: 202).

Slika 5.

Pojava horizontalnoga prostora znači kvalitativno najveći skok u percepciji prostora na dječjem crtežu u predškolskom razdoblju. Razlika u djetetovoj percepciji površine na kojoj crta kao dvodimenzionalnoga ili trodimenzionalnoga prostora prikazana je na Slici 5. Kao osmi kriterij istraživanja korišten je fenomen horizontalnoga prostora.

Slika 6. Prevaljivanje oblika (A, djevojčica 6 godina i 8 mjeseci) i djelomično preklapanje (B, djevojčica, 6 godina i 5 mjeseci)

Djelomično preklapanje

U ovoj fazi djeca prikazuju prostor tako da nacrtani predmeti djelomično preklapaju jedan drugoga (Hickman, 2010). Dijete prikazuje prostor i odnose između predmeta na različitim udaljenostima tako da objekti koji leže bliže djelomično preklapaju udaljene objekte (Grgurić i Jakubin, 1996). Do toga dolazi zbog djetetovih vizualnih dojmova iz okoline. Piaget i Inhelder (1971) nazvali su ovu fazu vizualnim realizmom „gdje se napokon pojavljuje vrsta crteža koja nastoji uzeti u obzir perspektivu, proporcije i udaljenost zajedno" (Piaget i Inhelder, 1971, str. 52).

Djelomično preklapanje prvi je djetetov stvarni pokušaj prevođenja trodimenzionalnih zakona u dvodimenzionalnu površinu. Za prijašnje faze možemo tvrditi, da „u početku ništa ne stvara razlike između bez dubine i dubine ili između ravnoga predmeta i obimnoga (Arnheim, 2009, str. 199).

Međutim, ova faza, iako s djelomičnim preklapanjem, već ukazuje na prostorne odnose u trećoj dimenziji, ali još uvijek ne predstavlja djetetovo razumijevanje složenosti euklidskoga prostora. „S druge strane, u slučaju euklidskih odnosa, očito je da intelektualni realizam obilježava pojavu ravnih linija, kutova, krugova, kvadrata i drugih jednostavnih geometrijskih figura, iako prirodno bez ikakvih točnih mjera ili proporcija" (Piaget i Inhelder, 1971, str. 51). Iako stručnjaci fenomen djelomičnoga preklapanja smještaju u razdoblje nakon sedme ili osme godine (Piaget i Inhelder 1971; Grgurić i Jakubin 1996; Karlavaris 1991), povremeno se pojavljuje i na crtežima mlađe djece. Stoga smo ga koristili kao posljednji, deveti kriterij istraživanja. Faze razvoja prostornoga crteža korištene u istraživanju prikazane su u Tablici 1.

Tablica 1.

Načini prikazivanja prostora koji se pojavljuju nakon šeste ili sedme godine starosti nisu obuhvaćeni u ovom istraživanju. U dječjim likovnim radovima kasne figurativne faze mogli bismo dalje istraživati pokušaje prikazivanja trodimenzionalnoga prostora s prikazom smanjivanja udaljenih objekata, s nebom, koje je obično ispunjeno (obojeno) sve do horizonta odnosno tla, umjesto da bude tek traka boja na vrhu stranice i slično (Hickman, 2010, str. 10).

Definicija problema istraživanja

U studiji smo pratili načine prikazivanja prostora kod djece u dobi od 4 do 6 godina. Ovo razdoblje odabrali smo zbog toga što tada dijete počinje sa simboličnim likovnim prikazom. To znači da se dječji crtež može koristiti u istraživačke svrhe za proučavanje prikaza prostora. Dijete se počinje likovno izražavati ranije, oko druge godine života, a pretežna aktivnost u dobi od 2 do 4 godine je škrabanje (Barnes, 2015, str. 31). Čak i ako djeca stvaraju figurativno u tom razdoblju, prikaze karakterizira „sintetička nesposobnost" (Luquet 1927, prema Piaget i Inhelder, 1971, str. 46). „Jedna od glavnih karakteristika sintetičke nesposobnosti jest da se dijelovi motiva jednostavno uspoređuju, umjesto da se kontinuirano povezuju. (Piaget, Inhelder, 1971, str. 49). Razdoblje između 4. i 6. godine Piaget i Inhelder nazivaju „intelektualni realizam" (1971, str. 49). Ovo je razdoblje „koje se ne sastoji od crtanja onoga što dijete zapravo vidi / ... / već svega što je tu / ... / Ovdje imamo shemu koja je djelomično namjerna i nedvojbeno sustavna i trajna" (Piaget i Inhelder, 1971, str. 50). Nakon šeste godine percepcija i prikaz prostora se mijenjaju (prelaze u druge faze). „Prava se projekcija počinje shvaćati (nakon 7-8 godina) upravo na mjestu gdje pseudorotacija karakteristična za razdoblje intelektualnoga realizma počinje nestajati" (Piaget i Inhelder, 1971, str. 51).

U tom su razdoblju odgojitelji primijetili i prvi pad zanimanja za likovno izražavanje. „Otprilike u dobi od 7 godina, ili čak i ranije, djeca mogu postati nezadovoljna simboličkim crtežima koje su napravila i vjerojatno će reći da ne mogu pravilno crtati." (Barnes, 2015, str. 24). „Prema prosjeku 8 i 9 godina napokon se pojavljuje vrsta crteža koja nastoji odjednom uzeti u obzir perspektivu, proporcije i udaljenost." (Piaget i Inhelder, 1971, str. 52).

Svrha istraživanja je utvrditi strategije prostorne interpretacije u ciljnoj skupini djece u dobi od 4 do 6 godina. Različita tumačenja prostora pokazuju kako djeca na različite načine percipiraju prostor. To je uvjetovano dobi djece i individualnim specifičnostima u umjetničkom razvoju pojedinca. Istraživanjem želimo produbiti razumijevanje razvoja prikazivanja prostora kod djece i tako utjecati na razvoj metodike likovne kulture predškolskoga razdoblja.

Istraživačka pitanja i hipoteze

U istraživanju smo postavili sljedeća istraživačka pitanja:

RQ1 - Je li ispravno pretpostaviti da u djece u dobi od 4 do 6 godina prevladava interpretacija prostora u odnosu odozdo prema gore (rub papira označava liniju tla, linija tla podignuta s ruba papira, rub papira označava liniju tla, pored nje je linija neba, linija tla podignuta s ruba papira i linija neba)?

RQ2 - Je li ispravno predvidjeti da se kod djece u dobi od 4 do 6 godina prikazi prostora koji uključuju angažman s trećom dimenzijom (vertikalna perspektiva i prevaljivanje oblika) javljaju u manjoj mjeri od ostalih načina?

RQ3 - Je li ispravno pretpostaviti da se kod djece u dobi od 4 do 6 godina više ne javlja zanemarivanje prostornih odnosa (konglomerat, definirani prostor)?

RQ4 - Je li ispravno predvidjeti da se kod djece u dobi od 4 do 6 godina elementarni načini prikazivanja prostora (konglomerat i definirani format) smanjuju?

RQ5 - Možemo li reći da kod djece u dobi od 4 do 6 godina, kada prikazuju prostor u odnosu odozdo prema gore (rub papira označava liniju tla, linija tla podignuta s ruba papira, rub papira označava liniju tla, pored nje je linija neba, linija tla podignuta s ruba papira i linija neba), određene razine predstavljaju niži nivo, dok druge predstavljaju razvojni viši nivo?

RQ6 - Je li ispravno predvidjeti da se kod djece u dobi od 4 do 6 godina povećava složeniji način prikazivanja prostora (vertikalna perspektiva, prevaljivanje oblika i djelomično preklapanje)?

U istraživanju su postavljene sljedeće hipoteze:

H1 - Postoje statistički značajne razlike između pojedinih načina prikazivanja prostora prema dobi u razdoblju od 4 do 6 godina.

H2 - Nema statistički značajne razlike u zastupljenosti prostora između djevojčica i dječaka u dobi od 4 do 5 godina.

H3 - Nema statistički značajne razlike u zastupljenosti prostora između djevojčica i dječaka u dobi od 5 do 6 godina.

Metode istraživanja

Ispitanici

Uzorak u istraživanju predstavljaju djeca između 4 i 6 godina. U uzorak je uključeno ukupno 807 djece.

Tablica 2

Prikaz uzorka prema spolu

U Tablici 2 vidimo da je uzorak uravnotežen prema spolu. Uzorak je dalje podijeljen u 8 dobnih skupina. Struktura podjele uzorka prikazana je u Tablici 3.

Tablica 3.

Ukupan uzorak učenika prema dobi

Tablica 3 pokazuje da smo djecu po dobi grupirali u tromjesečne skupine. U svaku je podskupinu bilo uključeno najmanje 79 do maksimalno 114 djece. U istraživanju bilo je 49,4 %, djece u dobi od 4 do 5 a djece u dobi od 5 do 6 godina bilo je 50,6 %. Uzorak je također uravnotežen prema starosnoj dobi.

Prikupljanje podataka

Likovne uratke djece prikupili smo za vrijeme pedagoške prakse studenata (Pedagoški fakultet Sveučilišta u Mariboru) u akademskoj godini 2016./17. i 2017./18. Djeca su u vrtićima dobila zadatak da nacrtaju sebe kako se igraju u sobi. Crteži su izrađeni u testnim uvjetima. Djeca su imala papir A4 i olovku (flomaster, olovka).

Postupci obrade podataka

Ocjenjivali smo dječja likovna djela prema tome kako su prikazala prostor i odnose u njemu. U skladu s teorijskim polazištima napravili smo skalu prostornoga prikaza od 9 točaka (Slika 2). To su bili: (1) konglomerat ili neprikazivanje prostora, (2) definiran format, (3) rub papira označava liniju tla, (4) linija tla podignuta s ruba papira, (5) rub papira označava liniju tla, pored nje je linija neba, (6) linija tla podignuta s ruba papira i linija neba, (7) vertikalna perspektiva, repeticija linije tla, (8) prevaljivanje oblika i (9) djelomično preklapanje. U svakom smo likovnom djelu odredili prevladavajući način prikazivanja prostora. Likovna djela ocjenjivao je stručni tim od tri likovna pedagoga i istraživača s dugogodišnjom praksom. Podatci su obrađeni statističkim paketom SPSS.

U istraživanju smo slijedili etiku u svim njezinim aspektima, i to: dobrovoljno sudjelovanje u istraživanju, informacije o istraživanju, zaštita identiteta pojedinca, povjerljivost i privatnost te poštivanje istine.

Rezultati i interpretacija

Tumačenje prikaza prostora s gledišta cjelokupnoga uzorka

Tablica 4.

Prvo smo analizirali načine predstavljanja prostora na cijelom uzorku. Otkrili smo da prevladava treća metoda, tj. rub papira označava liniju tla (27,9 %). Ovaj način prikazivanja prostora ilustrira djetetovu percepciju prostora u odnosu gore-dolje. Sljedeća tri najčešća načina prikazivanja prostora (rub papira označava liniju tla, pored nje je linija neba, linija tla podignuta s ruba papira i linija neba i linija tla podignuta s ruba papira) ilustriraju istu percepciju prostornih odnosa od vrha do dna, osim što je odnos odozdo prema gore prikazan na nešto sofisticirani način. Kao što se može vidjeti iz Tablice 3, četiri načina odozgo-dolje zajedničkoga prikazivanja prostora pokrivaju čak 70,9 %. Na temelju toga možemo potvrditi prvu pretpostavku (RQ1) da između četvrte i šeste godine života percepcija i prikaz prostora u odnosu odozdo prema gore prevladava bez bavljenja problemom treće dimenzije. Nadalje smo ustanovili da se načini crtanja prostora na kojima dijete pokušava prikazati treću dimenziju (vertikalna perspektiva, prevaljivanje oblika i djelomično preklapanje) javljaju u samo 6 % analiziranih crteža (Tablica 3). Možemo potvrditi drugu pretpostavku (RQ2) da se rješavanje problema treće dimenzije u dobi od 4 do 6 godina događa u manjoj mjeri.

Iznenadilo nas je da na čak 23,5 % analiziranih crteža prostor nije naznačen ni u odnosu gore-dolje (konglomerat, definiran format). Pretpostavili smo da se način crtanja, kada lebdi iznad papira i okrenut je u različitim smjerovima, više ne događa u tom razdoblju (RQ3). Pretpostavili smo da se djeca nakon četvrte godine vođena unutarnjim glasom koji im zapovijeda da ono što o prostoru već znaju i razumiju i prikazuju. Očito ne. To pripisujemo različitoj razvojnoj dinamici pojedinaca i djelomično, pojavi likovnih tipova (Lowenfeld i Brittain, 1987; Karlavaris, 1991; Duh i Zupančič, 2003). Općenito postoje dvije različite vrste učenika, vizualni i haptični. Vizualno dijete

bavi se svjetlom i sjenom, pokušava predstaviti trodimenzionalni prostor, koncentrira se na cjelinu, a ne na detalje, analitičnoga je pristupa. Haptično dijete je osjećajnije, daje značaj prostoru samo ako je to potrebno za izražavanje osjećaja i koncentrira se na detalje (Hickman, 2010, str. 19). Pretpostavka (RQ3) da se zanemarivanje prostornih odnosa kod djece u dobi od 4 do 6 godina više ne pojavljuje ne može se potvrditi.

Interpretacije prikazivanja prostora iz perspektive dječje dobi

U drugom dijelu interpretacije rezultata, uzorak je podijeljen u 4 dobne skupine. U prvoj su skupini djeca između 4 godine i 4 godine i 6 mjeseci, u drugoj od 4 godine i 6 mjeseci do 5 godina, u trećoj skupini djeca između 5 godina i 5 godina i 6 mjeseci, a u posljednjoj skupini djeca u dobi od 5 godina i 6 mjeseci do 6 godina. Načini interpretacije prostora za pojedinu skupinu djece predstavljeni su u Tablici 5.

Tablica 5.

Pretpostavili smo da se elementarni način prikazivanja prostora (konglomerat i definirani format) smanjuje u razdoblju između 4 i 6 godina. Podatci iz Tablice 4 to potvrđuju. Postotci konglomerata ili nedefiniranoga prostora smanjuju se s godinama s 31,3 %, preko 13,6 %, 5,5% na 3,1 %. Slično je i s drugim osnovnim kriterijem, definiranim formatom (12,4 %, 12,6 %, 7,7 % i 8,4 %), iako je ovdje trend smanjenja manji. Iako smo u prethodnoj tablici (Tablica 3) utvrdili da se nepredstavljanje prostora u dobi od 4 do 6 godina još uvijek događa u značajnoj mjeri (23,5 %), možemo potvrditi pretpostavku (RQ4) da elementarni načini prikazivanja prostora (konglomerat i definirani format) opadaju između 4. i 6. godine.

Najčešći načini prikazivanja prostora u tom razdoblju, ilustrirajući djetetovu percepciju prostora na razini odozdo prema gore (rub papira označava liniju tla, linija tla podignuta s ruba papira, rub papira označava liniju tla, pored nje je linija neba, linija tla podignuta s ruba papira i linija neba), pokazuju zanimljivu sliku u Tablici 4 . Prikaz prostora crtežom gdje rub papira označava liniju tla prisutan je u sličnom postotku kroz sva četiri dobna podrazdoblja. Slično je kada je nacrtana linija tla podignuta s ruba papira, dok se crtanje na način da rub papira označava liniju tla i pored nje je linija neba, povećava. Na temelju toga možemo odgovoriti na istraživačko pitanje (RQ5) i ustanoviti da je u načinima prikazivanja odozdo prema gore crtanje gdje rub papira označava liniju tla predstavlja raniju fazu, a prikazivanje kada rub papira označava liniju tla i pored nje je linija neba predstavlja viši stupanj razvoja.

Složeniji načini prikazivanja prostora (vertikalna perspektiva, prevaljivanje oblika i djelomično preklapanje) prisutni su u vrlo malim postotcima, a njihova se upotreba događa samo u starijim podskupinama. Očekivali smo da će se složeniji način prikazivanja prostora (vertikalna perspektiva, prevaljivanje oblika i djelomično preklapanje) povećati tijekom razdoblja između 4 do 6 godina. To je istina, ali u Tablici 4 vidimo da razlike između pojavnosti različitih načina crtanja prostora prema dobi nisu statistički značajne. Pretpostavka da se povećavaju složeniji načini prikazivanja

prostora (RQ6) nije ni potvrđena ni odbačena. Na temelju Kruskal-Wallisova testa odbacujemo hipotezu (H1) da su razlike u načinima prikazivanja prostora s obzirom na dob statistički značajne.

Na temelju interpretacija podataka u Tablici 5 otkrili smo da se u dobi od 4 do 6 godina načini interpretacije prostora u crtežu ne razvijaju linearno od ranijih do kasnijih, složenijih. Razlog tome vidimo u sljedećem. Istina je da se faze prikazivanja prostora razvijaju u skladu s intelektualnim razvojem djeteta, ali u likovnom izrazu ima nešto više od onoga što se može objasniti fazama razvoja. Atkinson se (2009) referira na isticanje „da su faze metafore" izazvale sliku koja je sugerirala da se dječji crtež postupno razvijao od jednostavnih do složenih oblika /…/ međutim, kada se razmišlja o univerzalnosti dječjega iskustva, to je slučaj da djeca imaju neodoljiv interes ili želju za predstavljanjem predmeta u prostoru s fiksnoga stajališta? Takva se reprezentacija bavi samo određenom iskustvenom orijentacijom unutar cijeloga univerzalnog iskustva. Da bi se ostale iskustvene orijentacije - poput maštanja, izrade karata, odnosa između predmeta, igranja igara, opisivanja sekvenci radnji – trebale artikulirati, trebat će im odgovarajući reprezentativni oblici. Nadalje, raznolikost takvih iskustava potaknut će različite kognitivne, afektivne i konativne nagone koji će voditi postupak crtanja"(Atkinson, 2009, str. 140). Pojavom složenijih načina prikazivanja prostora u dobi od 4 do 6 godina, iako u manjoj mjeri, potvrdili smo: „da je ipak moguće vidjeti da intelektualni realizam predstavlja vrstu prostorne reprezentacije u kojoj se euklidski i projektivni odnosi tek počinju stvarati, premda još uvijek u neskrivenom obliku što se tiče njihovih međusobnih veza." (Piaget i Inhelder, 1971, str. 50).

Tumačenje prikaza prostora iz rodne perspektive u dobi od 4 do 5 godina

Pri određivanju učinka spola, uzorak je podijeljen u 2 dobne skupine. Odlučili smo to učiniti na temelju pregleda dobivenih rezultata. U prvu skupinu spadaju djeca u dobi od 4 do 5 godina, a u drugu djecu u dobi od 5 do 6 godina.

Tablica 6.

Tablica 6 pokazuje da u dobi od 4 do 5 godina kod oba spola prevladava zastupljenost prostora crtanjem gdje rub papira označava liniju tla (28,4 %, 32,6 %). Slijedi konglomerat, također kod oba spola (22,2 %, 19,3 %). Budući da je riječ o mlađoj polovini uzorka, očekuje se rast konglomerata, ali i dalje nas iznenađuje relativno velik postotak djece koja nisu slikala prostor u svojem likovnom djelu, čak ni u njegovom elementarnom obliku. Ako zajedno pogledamo konglomerat i definirani format, utvrdit ćemo da čak 35,1 % djece nije prikazalo prostorne odnose, barem u odnosu od vrha do dna. Pojava ostalih načina prikazivanja prostora slična je kod oba spola (definirani format 13,3 %, 11,6 %; linija tla podignuta s ruba papira 12,8%, 10,5 %; rub papira označava liniju tla, pored nje je linija neba 11,5 %, 13,8 %; linija tla podignuta s ruba papira i linija neba 5,5 %, 9,4 % i vertikalna perspektiva za oba spola 2,8 %). Prevaljivanje oblika događa se samo u jednoga djeteta u tom razdoblju. Na temelju Mann-Whitneyeva

testa u Tablici 6, također vidimo da razlike između spolova nisu statistički značajne, što znači da nalazi visokoga postotka ne opisivanja prostora i gotovo nulte prisutnosti viših oblika prikazivanja razmaka između 4-5 godina za oba spola. Hipoteza (H2) se može potvrditi.

Interpretacija prikaza prostora iz rodne perspektive u dobi od 5 do 6 godina

Tablica 7.

Tablica 7 pokazuje da u dobi od 5 do 6 godina, slično dobi od 4 do 5 godina, zastupljenost prostora crtanjem tako da rub papira označava liniju tla prevladava kod oba spola (22,3 %, 28,1 %). Za dječake slijedi crtanje kada rub papira označava liniju tla nacrtana je i linija neba (20,7 %) kao drugi prikaz, dok za djevojčice te dobi pojavljuje se način gdje rub papira označava liniju tla, pored nje je linija neba (21,4 %). Na trećem mjestu za dječake je crtanje linije tla podignute s ruba papira (17,4 %), a kod djevojčica na trećem mjestu crtanje linije tla podignute s ruba papira i nacrtana je linija neba (20,1 %). Ostali modusi javljaju se u manjoj mjeri. U usporedbi s dobi od 4 do 5 godina, konglomerat se kao elementarna stopa javlja u malom postotku (5,4 %, 3,1 %), što je i očekivano. Tijekom pokušaja trodimenzionalnoga interpretiranje prostora u ovoj se dobi pojavljuje vertikalna perspektiva u nešto većoj mjeri (6,55 %, 7,1 %), s najmanje prevaljivanja oblika i djelomičnoga preklapanja. Rezultati Mann-Whitneyeva testa u Tablici 7 pokazuju da razlike nisu statistički značajne. Odbacujemo hipotezu (H3).

Usporedbom rezultata u tablicama 5 i 6 utvrdili smo sljedeće: utjecaj spola na prikaz prostora raste s godinama. Nadalje, u djece do pete godine spol ne igra istaknutiju ulogu, a između pete i šeste godine uloga spola postaje važnija. To barem dijelom pripisujemo činjenici da se s godinama djevojčice i dječaci sve više razlikuju u pogledu interesa, načina igre, motivacije za rad i različite razvojne dinamike. Tablica 7 pokazuje da se veća odstupanja između načina prikazivanja prostora prema spolu javljaju kod definiranoga formata (dječaci 14,1 %; djevojčice 3,1 %) i u načinu najvišega razvoja, djelomičnoga preklapanja (dječaci 0,0 %, djevojčice 2,2 %). Otkrili smo da se prvi kriterij, konglomerat kao cjeloviti ne-prikaz prostora, smanjuje i kod dječaka i kod djevojčica. Drugi kriterij, kada je definiran format, smanjuje se s godinama kod djevojčica, a kod dječaka u dobi od 5 do 6 godina u usporedbi s 4 do 5 godina pojavljuje se čak i u nešto većem postotku (13,3 % - 14,1 %). Kriteriji za prikaz prostora na relaciji odozgo prema dolje pojavljuju se u sličnom broju kod oba spola i obje dobi. U posljednjem kriteriju odnosa odozgo prema dolje, kod nacrtane vertikalne perspektive (repeticija linije tla), primijetili smo porast oba spola prema dobi (dječaci 4-5 godina - 2,8 %; djevojčice 4-5 godina - 2,8 %; dječaci 5-6 godina - 6, 5 %; djevojčice 5-6 godina - 7,1 %). S obzirom na to da se posljednji kriterij, djelomično preklapanje u dobi od 4 do 5 godina, uopće ne pojavljuje, možemo zaključiti da je složeniji prikaz prostora zasnovan na 3D odnosima razvojno uvjetovan i počinje se pojavljivati u većoj mjeri tek nakon dobi od šest godina.

Zaključak

Proučavanje razvoja prikaza prostora u dječjem likovnom izražavanju, kao što smo utvrdili u istraživanju, pomaže razumjeti one kognitivne procese u djeteta koji se odražavaju u njegovim likovnim uratcima. Istraživanje je pokazalo da djeca u dobi od 4 do 6 godina uglavnom prikazuju prostor u odnosu odozgo prema dolje, a da 3D prikazivanje prostora gotovo i ne postoji. Zanemarivanje prikaza prostora u dječjim likovnim uratcima je učestalo. Kako se dijete razvija opadaju raniji načini prikaza prostora, a pojavljuje se složeniji prostor u likovnim prikazima. Također smo otkrili da se razlike između spola u prikazu prostora javljaju s porastom godina, nismo ih otkrili u dobi od 4 do 5 godina, a otkrili smo ih u dobi od 5 do 6 godina. Rezultatima istraživanja pokušali smo dodatno objasniti neke aspekte razvoja likovnoga izraza. Istodobno smo omogućili profesiji likovne pedagogije da na temelju rezultata razvije nova didaktička načela i pristupe. Istodobno se smatra da se djetetov razvoj odvija automatski i prema određenim modelima ono se penje na sljedeći korak tek kad sazrije. „Ono što je očito jest da je dječji likovni razvoj složen proces interakcije između sve veće svijesti djece o sebi i svojoj okolini. Važnost ovoga prepoznavanja je da su djeca koja ne dobivaju potporu i smjernice u nepovoljnom položaju; razvoj bi se mogao dogoditi i bez „uplitanja" odraslih, ali potencijal će biti neostvaren (Hickman, 2010: 20). Na kraju, željeli bismo naglasiti da je dječji likovni razvoj teško protumačiti jednoznačno i linearno. Neke smo teoretski potkrijepljene nalaze potvrdili, neke osvijetlili u novom svjetlu, neke samo dodirnuli. Suvremena likovna metodika mora uzimati u obzir različite aspekte prilikom proučavanja dječjih crteža, što je također prikazano istraživanjem. Primjerice, mora se uzeti u obzir utjecaj vrsta umjetnosti (Lowenfeld i Brittain, 1987; Karlavaris, 1991; Duh i Zupančič, 2003) na djetetov izraz. Likovno obrazovanje također bi trebalo uzeti u obzir važnost konteksta učenja u ranim likovnim aktivnostima (Matthewa, 1999.), kulturnom kontekstu (Cox, 1998.), socio-kulturnim pristupima (Scott Frisch, 2006.) i drugima. Kognitivni pristup koji smo koristili u istraživanju samo je jedan od njih.

Međutim, detaljnim uvidom u ono što se trenutačno događa u djetetovom kognitivnom razvoju, kako ono percipira prostor, kako o njemu razmišlja i kako ga zamišlja, možemo taj razvoj poticati, voditi i dalje razvijati odgovarajućim pedagoškim utjecajima.