

## AN INVESTIGATION OF VISUAL PERCEPTION LEVELS OF PRE-SCHOOL CHILDREN IN TERMS OF DIFFERENT VARIABLES

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### Abstract

Pre-school ages, which is the period of rapid development of all developmental areas, is the stage in which children acquire visual perception ability and this ability acquisition process accelerates between the ages of three and seven. Visual perception that accelerates during childhood, is an important factor for academic and motor skills which are essential for school success. In this research, it is aimed to examine visual perception levels of preschool children according to various variables. The research was conducted through the survey model. The study population is consisted of children aged 5-6, who are attending preschools affiliated to the Ministry of National Education in Kadıköy, Maltepe, Beşiktaş and Sarıyer districts on Anatolian and European sides of Istanbul. The sample of the study consists of 114 children aged between 5-6 years and who study in preschools affiliated to the Ministry of National Education in these districts. The "Visual Perception Scale for Preschool Period" and personal information form were used to collect data for the study. Data were analyzed with Mann Whitney U test and Kruskal Wallis one-way analysis of variance. According to the results of the findings, while preschool children's visual perception levels do not differ according to the gender, age and duration of education variables; there is a significant difference in favor of high-middle socio-economic level based on the socio-economic level variable. The findings are discussed in the framework of the relevant literature.

*Keywords:* Visual Perception, Visual Perception Level, Preschool Period, Preschool Children.

### 1. Introduction

Perception means comprehending something by directing attention to it (Turkish Language Association, 2017). When an individual receives stimuli, his or her perception creates

sensations and he/she starts to work on these sensations. Sensations are formed through a mental process after being affected by various individual factors like perceptions of sensory organs, mental states, past experiences, mental processes and knowledge and motivation. Therefore, it can be claimed that perception is not defined as an assimilation of truth (Clark, 1999; Slavin 2015).

Perception process that takes place with our senses shows a very complicated development during the first years of life. There are studies and theories that advocate the view that the process of perception develops in a gradually complex way. The most well-known theory is the Gestalt approach (Zaporozhets, 1965). When the definition of Gestalt approach is considered by its verbal meaning, it refers to mental actions such as regulation and organizing; when it is considered as a noun, it refers to concepts such as shape, form, structure, picture are encountered (Sabar, 2013). Holistic approach was the prevailing view at the time people started to discuss about Gestalt (Clark, 1999; Han et al., 1999; Pinna, 2010; Rock & Palmer, 1990).

The pioneers of the Gestalt approach Wertheimer, Koffka and Köhler carried out studies on how the human perceives and what influences this perception process (Luccio, 2011; Wagemans et al., 2012). According to these psychologists, perception is giving meaning to what is perceived by eyes through grouping, simplifying and regulating by the brain automatically (Golombisky & Hagen, 2010). The Gestalt approach is a theory that attempts to understand how visual perception is occurred, the effective factors in the process of perception, and how these effective factors contribute (Luccio, 2011; Sabar, 2013; Soff, 2012; Wagemans et al., 2012).

It is an indisputable fact that interaction of all senses is essential for the full perception of the environment and the world. As 80 percent of the information we perceive is visual, it can be said that visual perception is the most effective one among other senses (Sarp, 2013). Preschool ages, which is the period of rapid development of all developmental areas, is the stage in which children acquire visual perception ability and this ability acquisition process accelerates between the ages of 3-7 (, Bangir-Alpan & Özbalcı, 2015; Turan, 2006; Yukay-Yuksel & Yurtsever-Kılıçgün; 2012).

The increase in the level of visual perception is important for the development of social skills. Eye contact, body language, facial expressions and gestures are non-verbal ways of communication and they are also visual clues for the child and through these clues, the child interprets the body language and gestures of the other person. In this way, the child initiates and maintains social relations with his friends (Kurtz, 2006).

Cognitive processes are also significantly influential in the realization of visual perception (Goodale & Milner, 1992; Luccio, 2011; Teleb et al., 2016). Thus, visual perception accelerating during childhood supports academic and motor skills which are necessary for school success (Brown & Gaboury, 2006; Dankert et al., 200;). At the same time, visual perception helps developing skills necessary for mathematics, literacy preparation and school success and which are acquired during preschool (Duru, 2008; Erdem, 2006; Harmankaya Maraşlı, 2010; Memiş & Harmankaya, 2012; Yukay-Yuksel & Yurtsever-Kılıçgün, 2012).

Inadequacies in the academic field can lead to problems in child's all areas of life, from school life to social life (Aral & Erturan, 1999). Researchers agree upon the idea that if children with perceptual and learning disorders are not diagnosed and treated at an early age, they will develop severe learning difficulties and related disorders in the future. This is also true for visual perception and what is essential in child's learning is the early detection of obstructive disorders rather than waiting for the visual perception to develop spontaneously (Marr et al., 2001; Turan, 2006; Yukay-Yuksel & Yurtsever-Kılıçgün, 2012). For this reason, it is important

to determine the visual perception level of the children who are attending to preschool education institutions and to provide necessary support for the children with deficiencies in this area.

In the visual perception studies prepared for pre-school children, the development and needs of children are taken into consideration. In the process of visual perception studies, worksheets for visual perception are prepared in order to maintain persistence and maintain continuity with visual perception education. These studies help children learn by trial and error (Beery & Beery, 2004; Koç, 2002;).

According to the literature considering visual perception there are studies investigating the relationship between; visual perception-reading rate (Memiş & Ayvaz Sivri, 2016), dynamic visual perceptions and reading skills of dyslexic children (Meng et al., 2011); supporting visual perception of children with learning disabilities (Mona et al., 2015), and comparing visual perception levels of students with mathematical learning disabilities and students with normal development (Pieters et al., 2012). In addition, there are also many studies testing the effectiveness of educational programs that improve visual perception skills in children (Cengiz, 2002; Dibek, 2010; Ercan & Aral, 2011; Kalkan, 2014; Kurtulmuş & Temel, 2013; Mona et al., 2015; Schonberg et al., 2014; Yıldırım et al., 2012; Yukay-Yuksel & Yurtsever-Kılıçgün, 2012; Teleb et al., 2016). The aim of these studies is to support the development of visual perception.

In contrast to the studies conducted on visual perception in preschool children in recent years, in this study it is aimed to examine visual perception levels of preschool children according to age, gender, duration of formal education and socio-economic level variables.

### **1.1. Aim of the study**

The purpose of this study is to determine visual perception levels of preschool children and to identify the differences in the visual perception levels of preschool children according to their gender, age groups, duration of formal education and socio-economic level of the districts where the research was conducted. Within the scope of this research, the following questions are asked:

1. What are the visual perception levels of preschool children participating in the study?
2. Do the visual perception levels of preschool children differ according to gender?
3. Do the visual perception levels of preschool children differ according to age?
4. Do the visual perception levels of preschool children differ according to the duration of formal education?
5. Do the visual perception levels of preschool children differ according to the socio-economic level of their parents?

## **2. Methodology**

### **2.1. Research model**

The research was conducted through the relational survey model. The opinions or characteristics (beliefs, knowledge, attitude, skill, talent, etc.) of participants related to a topic or an event are examined in survey models (Büyüköztürk et al., 2016). General survey models consist of a survey process conducted on a population, consisting of many elements, or a sample of this population so as to make a general judgment about the population. Relational survey models within this group are used for research models aiming at determining the presence of covariance between two or more variables (Karasar, 2016). Since visual perception levels of preschool children attending preschool education institutions in Istanbul province are

aimed to be examined according to different variables, the relational survey model was used in this study.

## **2.2. Population**

The population of the study consists of children aged between 5-6 attending preschools affiliated to the Ministry of National Education in the Kadıköy, Maltepe, Beşiktaş and Sarıyer districts within the Anatolian and European sides of İstanbul and which are considered as having a cosmopolitan structure with regards to socio-economic level.

## **2.3. Sample**

The sample group of the research consisted of 114 children aged between 5-6 years attending kindergartens in the schools affiliated to the Ministry of National Education in Kadıköy, Maltepe, Beşiktaş and Sarıyer districts on Anatolian and European sides of Istanbul. High-middle and middle socio-economic levels were taken into consideration in the study. Beşiktaş-Kadıköy districts were considered to represent high-middle socio-economic level and Maltepe-Sarıyer districts were considered to represent middle socio-economic level. Two schools were selected from each district.

While the schools participating in the study group were chosen by random sampling method; in the selection of children in these schools, random sampling was applied by excluding the children with attention deficit and hyperactivity disorder and developmental disorder. In random sampling method, the probability of selection of all individuals is the same and the choice of an individual does not affect the choice of other individuals (Büyüköztürk et al., 2016). The random sampling method is stronger than other methods in providing representation, in this reason this method was used in the study. The demographic information of the children participating in the study group is given on table 1.

Table 1. *Distribution of children in the study group by gender, age, duration of education and socio-economic levels*

Variable	Group	N	%
Gender	Girl	57	50
	Boy	57	50
	Total	114	100
Age	66 Months and Below	46	40
	67 – 72 Months	64	56
	73 Months and Above	39	34
	Total	114	100
Duration of Education	0 - 1 Year	56	51
	1 - 2 Years	54	49
	Total	110	100
Districts	Kadıköy	28	25
	Maltepe	26	23
	Beşiktaş	30	26
	Sarıyer	30	26
	Total	114	100

#### 2.4. Data collection instruments

In the study, "Personal Information Form" was used for collecting demographic data, including age, gender, the period of time spent by the child in formal education, and the district where the schools are located.

In order to determine the visual perception levels of preschool children, the "Visual Perception Scale for Preschool (VPSP)" developed by Kalkan and Arslan in 2015 was used. The Visual Perception Scale for Preschool that was developed by Kalkan and Arslan consists of 20 items. There are three factors. These are "discernment", "figure-background perception" and "matching". Each correct answer given to the scale is scored with "1", and each false answer is scored with "0". The highest score to be taken from the scale is "20", the lowest score is "0"

The reliability of the scale varies between .75 and .84 according to factors and in this study, it was observed to be between .55 and .89.

#### 2.5. Data collection method

Information about the children was obtained from the classroom teachers through the "Personal Information Form". In addition, the "Visual Perception Scale for Preschool" (VPSP) was applied to children participating in the study by individual interviews done by the

researchers at the schools where each child was present. Every interview was conducted in a quiet environment outside the classroom, where the implementer of the scale and the child were seated face to face. Each child was given only one pencil. The scale was applied to cover a maximum of 10 minutes for each child.

## 2.6. Analysis and interpretation of data

Data collected by the "Personal Information Form" and the "Visual Perception Scale for Preschool" (VPSP) were analyzed through the SPSS program. Firstly, the Kolmogorov-Smirnov test was used to check whether or not the data showed normal distribution; it was observed that the data were not normally distributed ( $p < .05$ ). For this reason, non-parametric tests were used. The Mann-Whitney U test was used to investigate whether or not visual perception levels of preschool children differed according to gender, duration of formal education, and socio-economic level (quality of life) of districts. In order to determine whether or not there was a difference in the visual perception levels of preschool children according to their ages, the "Kruskal-Wallis" analysis was applied.

## 3. Findings

The results of the statistical analysis, in accordance with the questions aroused in the study, are as follows:

Table 2. *Visual perception levels of pre-school children's according to mean and standard deviation rate*

Dimansions	N	$\bar{X}$	SD
Differentiation	114	11,20	2,12
Figure-ground perception	114	2,58	1,24
Matching	114	,42	,93
Total	114	14,21	2,62

As shown in Table 2, the average of pre-school children from differentiation the sub-dimension of the scale, 11,20; standard deviation 2,12; the average of pre-school children from figure-ground discrimination the sub-dimension of the scale 2,58; standard deviation 1,24; the average of pre-school children from matching the sub-dimension of the scale; ,42, standard deviation ,93 and mean score from the total of the scale is 14,21; standard deviation 2,62,

Table 3. *Mann-Whitney U test results: Showing visual perception levels of pre-school children according to gender*

Gender	N	Mean Rank	Rank Sum	U	z	p
Girl	57	61,43	3501,5	1400,0	-1,283	,200
Boy	57	53,57	3053,5			

It is evident on Table 3, visual perception levels of preschool children did not differ according to their gender ( $U=1400,0$ ;  $z=-1,283$ ;  $p>,05$ ).

Table 4. *Kruskal Wallis one-way ANOVA results showing visual perception levels of preschool children according to age*

Months	N	Mean Rank	Sd	$X^2$	p	Meaningful Difference
66 months and below	23	64,35				
67-72 months	52	52,68	2	2,344	,310	-
73 months and above	39	59,88				

It is evident on Table 4 that there is not a significant difference between visual perception levels of preschool children according to their age ( $X^2(2)=2,344$ ,  $p>,05$ ).

Table 5. *Mann-Whitney U test results showing visual perception levels of pre-school children according to duration of formal education*

Duration of Formal Education	N	Mean Rank	Rank Sum	U	Z	p
0-1 year	56	52,76	2954,5			
1-2 years	54	58,34	3150,5	1358,5	-,927	,354

As indicated in Table 5, there is not a significant difference between duration of formal education and visual perception levels of preschool children ( $U=1358,5$ ;  $p>,05$ ).

Table 6. Mann-Whitney U test results showing visual perception levels of pre-school children according to socio-economic levels of districts

Districts	N	Mean Rank	Rank Sum	U	Z	p
Beşiktaş-Kadıköy	57	65,07	3709,0	1193,0	-2,471	,013*
Maltepe-Sarıyer	57	49,93	2846,0			

\* $p < ,05$ 

As shown in Table 6, visual perception levels of preschool children differed according to socio-economic levels of the districts where the study was conducted ( $U=1193,0$ ;  $p < ,05$ ).

#### 4. Result and discussion

According to the results of the study examining visual perception levels of preschool aged children with respect to their gender, age, period they received formal education and socio-economic status of the district the study was conducted in;

**1. In this study, visual perception levels of preschool aged children were observed to be slightly above average.** In order to dwell on this finding, based on the fact that the variety of stimuli that children are exposed to shows development in the other senses of children, it can be assumed that the children participating in the study are exposed to sufficient number or more stimuli and this positively affects visual perceptions of these children. However, there are also studies underlining that children with low socio-economic level (poor) have a lack of stimulus (Şener & Ocağcı, 2014). Because the economic status of the districts the study was conducted in are at medium and high-medium level, the type of stimulus that the children living in these areas receive is affected by their economic status and this may have affected their visual perception levels.

**2. Visual perception levels of preschool aged children do not differ according to their gender.** That there was no difference in the study based on gender can be related to brain development and brain volume. It is assumed that brain development will be similar in male and female children up to a specific age and thus, so will their visual perception levels. However, according to a study there are small differences in brain volume with respect to children between ages 5-17 (Reiss et al., 1996). The result of this study is parallel with results of various other studies (Arı, 2007; Duru, 2008; Harmankaya, 2010; Memiş and Harmankaya, 2012). But these studies were conducted on primary school children. In addition, in the study where Değirmenci (2014) examined the relationship between visual perception levels and perceptive-taking skills of 48-60 months old children, a difference was found between visual perception and gender: Female children were observed to be more successful in visual perception development than male children. In the study conducted by Cheung et al. (2005) on primary school aged children, a difference on visual perception was observed with respect to gender. Thus, visual perception levels of female children were found to be higher than male children. Pittorf, Lehmann and Huckauf (2014) conducted a study and examined visual working memory and perceptual speeds of 3-6 year old children. It was observed that there is a difference between the visual working memories of male and female children. This difference was in favor of male children and visual working memories of males are at better level than females. In addition, it was found that there is a difference in visual information processing

speeds of female and male children and this difference is in favor of male children. Visual information processing speed of male children is higher than female children.

**3. It was observed that visual perception levels of preschool aged children do not statistically differ according to their age.** The reason for this may be because the ages of the children in the study group were close to each other. This result is similar with other studies. According to previous studies, visual perception levels of children of older age are higher than children of smaller age (Cheung et al., 2005; Değirmenci, 2014; Erdem, 2006). Öztoklu-Durmuş (2014) state that 49-60 months old children's visual perception scores are at expected level; and 61-70 months old children's visual perception states are below expected level. The reason why older age children have higher visual perception levels than smaller children can be due to the education they receive. When previous studies (Cheung et al., 2005; Değirmenci, 2014; Erdem, 2006) are considered, it is evident that the children are at primary school level or an educational program supporting visual perception is carried out on children. Difference in gender may not have been observed in this study because it approached early childhood period and because visual perception is not fully developed in this period. Although visual perception is matured during primary school; it may not have a development area to mature on its own during early childhood. However, Arıkök (2001) states that children who recently begin primary school are not mature enough to solve problems related to visual perception.

**4. No statistical and significant difference was observed between visual perception levels of preschool aged children and the period of time they received formal education.** Visual perception activities (hand-eye coordination, figure-ground discrimination, figure consistency, position in space, spatial relations, speed etc.) are included in the preparation activities for reading and writing in the Preschool Education Program; acquisitions and indicators concerning visual perception are also underlined in the program (MEB, 2013). That there was no difference in children who participated in the program and received education for two years can be due to the fact that the program is not as effective as it is expected or is not carried out efficiently. Whereas, visual perception skills should be supported by conducting appropriate education programs rather than expecting them to develop on their own during the preschool period (Görener, 2006).

**5. It was observed that there is a significant difference in favor of high-medium socio-economic level between visual perception levels of preschool aged children and socio-economic status (high-medium, (medium) of the district the study was conducted in.** Socio-economic status is a part of life quality; thus life quality may have led to this difference. People who live in places with high life quality benefit from education, health and social setting opportunities at a higher rate (Şeker, 2015). Life quality is constructed by many factors. These are listed as; benefiting from health and education services, sufficient nutrition and protection, a healthy environment, rights, opportunity and gender equality, participating in daily life, reputation and security. Lack of any of these factors negatively affects a life of good quality (Şeker, 2011). Thus, children living in a high-medium socio-economic level environment may have benefitted more from educational opportunities and this education may have affected their visual perception levels. Families with high-medium socio-economic level may have offered their children more visual stimuli and provided them settings rich in visual stimuli. In their study Pittorf, Lehmann and Huckauf (2014) found that being exposed to a visually presented object for a long time facilitates remembering and observed that visual working memory depends highly on perceptual speed. For this reason, visual perception levels of children with high-medium socio-economic level may be high because they are exposed to objects for long periods of time.

In light of the research results, following suggestions are presented:

### **Suggestions for researchers**

When the studies on the visual perceptions of preschool children are examined, it is observed that there are studies (Cheung et al., 2005; Değirmenci 2014; Pittorf, Lehmann & Huckauf 2013) in which visual perception levels of children vary in accordance with the gender variable. Nevertheless, there are studies (Ari, 2007; Duru, 2008; Harmankaya, 2010; Memiş & Harmankaya, 2012) in which visual perception levels of children do not differ according to gender variable. As current results are differing on gender variable, further researches examining the relation between visual perception levels and gender can be done.

In this research, the birth months of children are close to each other is seen as a limitation. Thus it can be recommended that similar studies with different age groups can be applied.

It is seen as a limitation that this study is conducted with children of upper-middle and middle socio-economic status. In addition, it is not seen in current literature investigating the relationship between visual perception levels of children and their socioeconomic status. Therefore, further researches can be done to identify the relationship between visual perception levels of children and their socio-economic status. In the light of these findings, developmentally appropriate programs can be prepared to enhance the level of visual perceptions of children.

In this research, children from public preschools are included. Further researches can be applied to compare the levels of visual perception of children from both public and private preschools.

### **Suggestions for organizations and institutions**

In this research, the levels of visual perceptions of children were found above the average. Based on this evidence, the following recommendations can be presented:

The levels of visual perceptions of children were not found significantly different by the time period children receive formal preschool education. The reason of this result is interpreted as teachers' failure in implementing the program effectively. For this reason, in-service educations for teachers on methods to study visual perception can be done.

Diversity in visual perception studies in preschools can be achieved. By supporting these studies, the quantity and content of studies can be enhanced.

### **Suggestions for teachers**

Based on the evidence that the ratio of the people living in places with high quality of life benefit from educational, health and social services and the visual perception scores of children living in these districts is above the average, it can be recommended that teachers give more importance to the applications in their programs which improve the visual perception and prepare more visually stimulating environments for children.

### **ENDNOTE**

This study is orally presented at 5<sup>th</sup> International Preschool Education Congress in Gazi University, Ankara.

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