

An Investigation of Color Preferences of Students with Special Needs

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Abstract

The purpose of this study was to examine the primary and secondary color preferences of students with special needs as well as their color preference for an object regarding their disability types, school levels, and gender. The study employed a survey research design with quantitative methodology. It was conducted with the participation of 549 students with Intellectual Disability, Autism Spectrum Disorder, Down Syndrome and Learning Disability. The researchers collected the data by using a car visual together with the geometric shapes used by Ece and Çelik (2009). The collected data were entered into the Excel program, and the frequency and percentage values were obtained. The results revealed that according to their school level, students' primary and secondary color preference changed. When the geometric shape was changed, students' color preferences changed, accordingly. With respect to their disability types, students preferred red as the primary color and blue as the secondary color, and they chose blue for the car visual. It was found that while primary and secondary color preferences of male and female students differed but they preferred blue for the car visual.

Keywords: Colors; Color Preference; Students With Special Needs

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INTRODUCTION

Colors are defined as the forces that exist in the perception limits of individuals and that being lived together at all times, but the effects of which are often not noticed (Koca & Koç, 2008). Colors can be a visual expression of an individual's mental state, emotions and character by affecting all areas of life especially in the produced color form. Based on the culture, age (Adams-Osgood, 1973), gender, development level, the studied topic, and the activity conducted, colors have a direct impact on the moods, emotions, behaviors and performances of individuals (Daggett, 2008). The low or high vibrational energies of colors affect the physical, emotional, and mental reactions of individuals, and yet, the individuals' reactions to colors can differ. While some colors have a stimulating effect on individuals, some others have a calming effect. On the other hand, some colors have a relaxing effect, whereas some others may cause anxiety.

As colors are the perceptions constructed by the brain (Kümmerling-Meibauer, 2019), they are perceived primarily sensorially (Etike, 2001). The reason behind the perception of colors is that each individual sees a color differently because the same color appears differently on a textured or reflective surface. There is a direct connection between the brain and the body, and the reactions related to colors appear independently of thoughts (Daggett, 2008). Bright and intense colors receive a response from the primitive brain called the limbic system. This is a response associated with biological color inheritance. The role of the left brain is to name colors, label them with qualifications (lemon yellow), transforming words or colors into emotional responses, and enumerate the steps in color creation. On the other hand, the role of the right brain is to specialize in the perception of color associations and the discovery of consistency patterns. Because of the fact that a child's brain connections are not completed by the age of five or six, and s/he needs another year to mature, the child employs visual materials to communicate with the environment. Therefore, colors become one of the most effective means of communication for children.

Colors can be defined through the terms used for color temperatures. These color temperatures show that vibrant colors, known as warm colors, exist in the red range, and cool colors, representing silence and relaxation, exist in the blue range (Ballast, 1992). Since warm colors can be noticed and seen quickly in the visual order, they create the feeling of closeness (Uçar, 2004). While red, orange, and yellow, known as warm colors, increase joy, creativity, energy and dynamism, they can cause the feelings such as excitement, tiredness, violence, aggression and the concentration difficulty (Becer, 1999). Cool colors, on the other hand, create a withdrawal effect by generating a feeling of avoidance in individuals (Çeken, 2005; Uçar, 2004). Green, blue, and purple are defined as cool colors, and these colors fall on the retina of the eye a little bit later than others, and they are perceived as stagnant (Hidayetoğlu, 2010). In addition, they create comfort and relaxation effect on individuals (Artut, 2004; Sağocak, 2005). Within this context, it can be stated that individuals approach warm colors psychologically in a positive way, whereas they react to cool colors negatively (Akkin et al., 2004; Cyr et al., 2010; Engelbrecht, 2003; Koçak & Paksoy, 2004).

Even though the contextual and learning dimensions are effective in the color preferences, liking also plays an important role, which is completely under control of an individual (Amsteus et al., 2015). Individuals tend to choose the color which is closest to them in a painting activity. In general, it may be the case that the individuals prefer to use the color which is closest to them all their paintings. It has been emphasized that it is difficult to make fixed judgments about colors as the psychological meanings of colors change from child to child (Gier, 2015; Schultz, 2007; Yavuzer, 1993). As such, children can associate colors with an object they have learned or loved. It has been well-recognized that children prefer their most preferred colors for the objects they like and describe as beautiful, whereas they choose their least preferred colors for the objects they dislike and describe as bad. On the other hand, children prefer neutral colors for the objects they are neutral (Burkitt et al., 2003).

The age, level of education, gender, and level of culture of individuals have an impact on their color preferences, and these variables can change their color preferences. Zemach et al. (2007) concluded that while newborn babies prefer dark stimuli, 3–4-month-old babies prefer red and blue

colors. Having examined the packaging color preferences of preschool children in product selection regarding their age and gender, Marshall et al. (2006) found that pink, purple and yellow are the most popular colors among these children. Frielig (1979) investigated the liked and disliked colors by showing twenty-three colors to children and teenagers between the ages of five and nineteen. The researcher (1979) reported that individuals like the colors such as grey and black in their upcoming, which were disliked in childhood, whereas although colors such as violet and purple were liked in childhood, these colors were disliked after adolescence. Though it is stated that children like and prefer common colors in certain age periods, color preferences may differ according to their emotional states, feelings, or the way they express themselves. In addition, it is expressed that personal preferences, cultural and social norms are also effective in the interpretation of the colors that individuals prefer to use (Malchiodi, 2013; Schulz, 2007).

Individuals with ID usually choose colors unconsciously or they choose colors with the help of someone. It has been reported that these individuals prefer to use vivid and warm colors that attract their attention more in color preference. As individuals with ID have more difficulty in expressing themselves verbally, colors play an important role in expressing their feelings and thoughts. It was found that individuals with ID tend to choose the same color as individuals who are mentally healthy but younger than themselves (Çelik, 2009).

Individuals with ASD perceive colors differently (Franklin et al., 2008) and intensely, and they have obsessions such as the same color and variety (Çetin & Kurnaz, 2017). Studies have indicated that children with ASD have an obsession with the green color (Higashida, 2013; Silberman, 2015). Bright colors and warm colors create a negative effect for these individuals. In an attempt to compare the color perception between children with ASD and children with typical development, Franklin et al. (2008) found that there was no difference in color perception between children in both groups. Although the basic mechanism for the perceptual classification of colors does not differ between children with ASD and the typically developing children, an increased sensitivity to sensory stimulation, which is a characteristic of ASD (Markram & Markram, 2010), affects the color perception.

While some of the students with LD experience active behavior and stimulation problems; others have the characteristics of being calm and introverted. Students who are introverted due to LD prefer yellow, orange, and purple colors that have high energy and increase attention. Students who are more energetic and active choose blue and green colors that have a calming effect. Relatedly, Gregor and Newell (2000) discovered that individuals with dyslexia prefer dirty green-brown and blue-yellow colors. Overall, creating opportunities for the students with special needs (SSN) to choose the color they use gives those students the feeling that they can control their own life, and in turn, the opportunity to act independently is effective in increasing their self-confidence. In other words, SSN can reduce externalization behaviors by expressing their inner feelings. Through colors, it is possible for SSN to express their feelings, which they have difficulty in expressing and sharing by verbal communication.

Due to the inadequacy of their social skills in their daily lives, SSN experience difficulties in expressing themselves. Thus, colors are an important tool for them in expressing their inner world and different emotions, and comprehending the behaviors and emotions of themselves and other individuals around them. In this context, as a reflection of his/her inner world and emotions, the color used by each SSN differentiates the meaning it carries. The colors preferred to be used in their paintings play an important role in handling the difficulties that arise as a result of the lack of communication between SSN and adults. People unconsciously express the world, situations, emotions or moods with the colors they choose. Colors remind different emotions in each person, and they have psychological effects on people. The relationship between color and emotion (Imhof, 2004; Zentner, 2001) is closely related to color preferences, in other words, whether the color evokes a positive or negative emotion in the individual. Research on color psychology has shown that there is a relationship between colors and emotions (Terwogt & Hoeksma, 1995; Uzunboylu & Evram, 2017) and although there is no clear reason to explain how colors can affect emotions exactly, they affect

individuals' emotions, attention, judgments and decisions. (Babin et al., 2003; Noiwan & Norcio, 2006). Therefore, it is necessary to be aware of the color preferences of students with special needs in the organization of learning environments, in the design of tools, materials, and clothes. Considering that the colors preferred by SSN reflect their dreams, conflicts and concerns, and therefore their emotional and psychological characteristics, it is a must to determine their primary and secondary color preferences and their color preference for objects, and to examine the distribution of these preferences according to their disability types, school levels and gender. Considering this gap, this study can contribute to the related literature regarding the color preferences of students with special needs.

METHOD

Research Design

This study adopted a survey research design with quantitative methodology. This type of design aims to describe a past or present situation as it is (Kıncal, 2015). The individual or object that is the subject of the research is tried to be defined in its own conditions and as it is, without any intervention to change or influence it in any way. Investigating a phenomenon without any attempt to change it is central to survey research design (Karasar, 2006). The reason behind adopting this research design in this study is that the researchers attempted to explore the current situation of the color preferences of SSN from different perspectives in its own conditions.

Participants

In this study, as one of the purposive sampling methods, criterion sampling method was employed in the recruitment of the participants. The essence of the criterion sampling method is to study all cases that meet a set of predetermined criteria (Yıldırım & Şimşek, 2016). The criteria in this study are a) the ability of SSN to fulfill the given instructions, b) the sufficient strength of their hand muscles to hold the crayons, and c) their willingness to participate in the study.

The study involved a total of 549 students including 400 students with ID, 85 students with ASD, 56 students with DS, and 8 students with LD. Table 1 displays the demographic information about the students.

Table 1: Demographic background of SSN

School Level									
Disability Type	Pre-school		Primary		Secondary		Vocational Training		Total
	f	%	f	%	f	%	f	%	
ID	15	4%	93	23%	126	32%	166	42%	400
ASD	10	12%	44	52%	28	33%	3	4%	85
DS	11	20%	21	38%	15	27%	9	16%	56
LD	0	0	2	25%	2	25%	4	50%	8
Total	36		160		171		182		549
Disability Type									
Gender	ID		ASD		DS		LD		Total
	f	%	f	%	f	%	f	%	
Male	227	57%	50	59%	36	64%	5	62,5%	318
Female	173	43%	35	41%	20	36%	3	37,5%	231
Total	400		85		56		8		549

With respect to school level, almost half of the students with ID (166; 42%) are trained in vocational training centers while more than half of students with ASD (44; 52%) are from primary school. More than two-thirds of the students with DS (21; 38%) attend primary school whereas half of the students with LD (4; 50%) are educated in a vocational training center. When all types of disability are considered in general, one third of the students participating in the study are trained in a vocational

training center. As for the gender distribution of SSN according to disability types, it is obvious that the number of male students is more than female students in all disability groups. In brief, 318 male and 231 female students participated in the study.

Data Collection Tools

In order to determine the color preferences of SSN according to shapes, geometric shapes used by Ece and Çelik (2008) as a data collection tool were used in this study. In addition, a car picture developed by the researchers was used as the data collection tool. In determining the color preferences of SSN according to shapes, the researchers used square and circle as geometric shapes. A circle divided in half was adopted to identify the primary and secondary color preferences. Moreover, a car visual was used to determine the color preferences of SSN for an object. The rationale behind the use of a car visual is that since there is no specific color for cars, cars can be in all colors. 20 students with special needs did painting activities in the company of 3 experts. At the end of the activity, the opinions of the experts that the two items are valid in determining the change in the color preferences of the students depending on the shape were analyzed by means of Kappa analysis. Three experts, having a degree of doctorate in the field of special education, gave their opinions on the suitability of the items, and the internal consistency of the opinions between the experts was tested using the Cohen Kappa technique. The Kappa value was found to be 0.87 (perfect fit between 0.81 and 1.00). In order to determine the reliability of the items, 20 students repainted the same shapes with an interval of two days, and it was found that 95% of the students painted the same shapes in the same color. As a result, it was concluded that the two items had consistency reliability in determining the color preferences of students.

Data Collection Procedures and Analysis

In the process of data collection, the students were first given a circle and a crayon box of the same type and brand in order to determine whether the color preferences of SSN change according to the shapes. It was ensured that the students were seated in a way that they were not influenced by each other. SSN were asked to choose their favorite color, and the other colors were put in the crayon box. The students were instructed to paint the circles. After the circle was painted, a square was given to the students in order to determine whether the color preferences of them changed when the shape changed, and the same process was repeated.

A circle divided in half was used to determine the primary and secondary color preferences of SSN. To do so, the students were given a circle divided in half by a line and a crayon box of the same type and brand. First, the students were asked to choose their most favourite color and paint the first half of the circle. Next, they were asked to choose their second most favourite color and paint the other half of the circle. At this stage, the other colors that the students did not choose were not put in the box.

In order to collect the data on the color preferences of SSN for an object, they were given a hand-drawn car visual and the same type and brand of crayons, and the students were asked to choose their favorite color and paint the car. It was decided to use geometric shapes as they do not remind SSN of any shape, form or object. The car visual is also drawn in a typical car view. Considering that the cars can be in many different colors, the researchers attempted to determine whether there would be a change in students' color preferences in the transition from a geometric shape to a meaningful object. Taking the disabilities and demographic characteristics of the students into account, the two geometric shapes and pictures of cars painted by the student with special needs were collected by the researchers, separated into color categories, and classified within themselves. The data of the demographic background and color preferences of the students were entered into the Excel program. The data were analyzed through calculating the frequency and percentage values.

FINDINGS

In the first sub-problem of the study, the question "What are the color preferences of SSN for geometric shapes according to their school level?" was answered. The color preferences of the students are shown in Table 2.

Table 2: The color preferences of SSN for a circle

Circle	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
School Level	PS	6	17	4	11	6	17	4	11	1	2,8	3	8,3	3	8,3	4	11	36
	PriS	24	15	26	16	27	17	25	16	12	7,5	4	2,5	11	6,9	17	11	160
	SS	28	16	26	15	31	18	28	16	11	6,4	13	7,6	10	5,8	13	7,6	171
	VT	30	16	25	14	32	18	28	15	15	8,2	10	5,5	13	7,1	20	11	182
Total		88	16	81	15	96	17	85	15	39	7,1	30	5,5	37	6,7	54	9,8	549

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

As Table 2 displays, 6 of the pre-school students (17%) preferred green and red to paint the circle shape. 27 of the primary school students (17%) chose green, 26 (16%) chose yellow, 25 (16%) chose blue, and 24 (15%) chose red to paint the circle. As for the secondary school students, 31 (18%) of them preferred green, whereas 28 (16%) of them chose red and blue to paint the circle. Of the students from vocational training center, 32 students (18%) chose green, 30 students (16%) chose red, and 28 students (15%) chose blue. Overall, it was found that 96 students (17%) preferred green, 88 students (16%) preferred red, and 85 students (15%) preferred blue.

In the second sub-problem of the study, an answer to the question "Do the color preferences of SSN change when the shape changes according to school level?" was sought. The color preferences of the students are displayed in Table 3.

Table 3: The color preferences of SSN for a square

Square	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
School Level	PS	4	11	4	11	8	22	3	8,3	5	14	2	5,6	3	8,3	3	8,3	37
	PriS	18	11	23	14	35	22	19	12	8	5	12	7,5	12	7,5	15	9,4	160
	SS	25	15	20	12	33	19	30	18	18	11	2	1,2	11	6,4	18	11	171
	VT	23	13	31	17	31	17	25	14	10	5,5	13	7,2	9	5	28	15	181
Total		70	13	78	14	107	21	77	14	41	7,5	29	5,3	35	6,4	64	12	549

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

When Table 3 is examined, 8 (22%) of the preschool students painted the square in green; 5 students (14%) in brown; and 4 students (11%) in red and yellow. There was no change in the status of green, red, and yellow. However, it is seen that while 1 student (2.8%) chose brown to paint the circle, 5 students (14%) preferred brown to paint the square. In light of these data, it was found that the color preferences of SSN partially changed in the preschool period.

As for the primary school students, 35 of them (22%) preferred green while 23 students (14%) chose yellow to paint the square. 19 students (12%) used blue color to paint it. There was no change in the status of green, yellow, and blue. It is clear that while 4 students (2.5%) preferred pink to paint the circle, 12 students (7.5%) painted the square in pink. Similarly, 24 students (15%) painted the circle in

red, whereas 18 students (11%) painted the square in red. 12 students (7.5%) chose brown to paint the circle while 8 students (5%) preferred brown to paint the square. It is obvious that there was a change in the color preferences of primary school students with respect to the colors pink, red, and brown.

In the secondary school level, 33 students (19%) preferred green to paint the square whereas 30 students (18%) chose blue to paint it. 25 students (15%) opted red for painting. There was no change in the color preferences of SSN regarding the colors blue and red. It is seen that while half of the students chose yellow to paint the circle, they preferred green more to paint the square. Moreover, there were 13 students (7.6%) who preferred pink to paint the circle, and only 2 students (1.2%) painted it in pink. Overall, it is evident that the color preferences of SSN at the secondary level differed.

As for the students from the vocational training center, 31 of them (17%) opted yellow and green to paint the square, whereas 28 students (15%) painted it in orange. The color green was preferred by 32 students (18%) to paint the circle while 31 students (17%) preferred green for the square. It was found that while red and blue colors are preferred more by SSN for the circle, the colors yellow and orange were chosen for the square. For the circle, 13 students (7.1%) used purple, and 9 students (5%) preferred purple for the square. In light of these findings, it can be stated that there was a partial change in the color preferences of the students. When evaluated in general, it can be stated that 107 of SSN (21%) preferred green and 78 students (14%) chose yellow, whereas 77 students (14%) used the color blue to paint the square.

In the third sub-problem of the study, the question "What are the primary color preferences of SSN according to their school level?" was answered. In order to answer this question, the researchers asked students to paint the first half of the circle first, and then the students were told to paint the second half of it. Table 4 shows the color preferences of the students.

Table 4: The primary color preferences of SSN according to their school level

Primary Color	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
School Level	PS	3	8,3	3	8,3	5	14	7	19	3	8,3	5	14	3	8,3	5	14	36
	PriS	33	21	16	10	16	10	21	13	18	11	11	6,9	10	6,3	19	12	160
	SS	30	18	22	13	24	14	29	17	12	7	16	9,4	13	7,6	14	8,2	171
	VT	27	15	36	20	35	19	30	17	8	4,4	7	3,9	9	5	20	11	182
Total	93	17	77	14	80	16	87	17	41	7,5	39	7,1	35	6,4	58	11	549	

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

As Table 4 indicates, at the preschool level, 7 students (19%) preferred blue, whereas 5 students (14%) chose green, pink and orange as the primary color. As the primary school students, 33 students (21%) opted red, 21 students (13%) preferred blue, and 19 students (12%) chose orange as the primary color. At the secondary school level, 30 students (18%) chose red, 29 students (17%) opted blue, and the primary color was green for 24 students (14%). It is also seen that regarding vocational training level, 36 students (20%) preferred yellow, 35 students (19%) chose green, and it was blue for 30 students (17%) as their primary color. In general, 93 students (17%) preferred red, 87 students (17%) chose blue, and 80 students (16%) favoured green most, whereas only 35 of the students chose purple as the primary color, and purple was the least preferred color.

In the fourth sub-problem of the study, an answer was sought to the question "What are the secondary color preferences of SSN according to their school level?". In order to determine this, the students were asked to paint the first half of the circle and then the second half it. The color preferences of the students are displayed in Table 5.

Table 5: The secondary color preferences of SSN according to their school level

Secondary Color	Red		Yellow		Green		Blue		Brown		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
PS	1	2,8	3	8,3	7	19	7	19	3	8,3	2	5,6	2	5,6	36	
School Level	PriS	17	11	25	16	17	11	32	20	17	11	12	7,5	11	6,9	160
	SS	17	9,9	20	12	34	20	28	16	18	11	13	7,6	20	12	171
	VT	13	7,1	21	12	30	16	43	24	11	6	7	3,8	28	15	182
Total	48	8,7	69	13	88	16	110	20	49	8,9	34	6,2	61	11	549	

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

It is clear in Table 5 that 7 preschool students (19%) used green and blue while 32 students (20%) preferred blue and 25 students (16%) from primary school chose yellow to paint the circle. At the secondary school level, 34 students (20%) opted green, whereas 28 students (16%) favoured blue. Regarding the vocational training level, 43 students (24%) preferred blue as the secondary color, and it was green for 30 students (16%). Overall, 110 SSN (20%) preferred blue, and the color green was chosen by 88 students (16%) as the secondary color to paint the circle. Purple was the least preferred color as the secondary color preference.

In the fifth sub-problem of the study, the question "What are the color preferences of SSN to paint an object according to their school level?" was answered. To do this, students were asked to paint a car visual. The color preferences of the students are shown in Table 6.

Table 6: The color preferences of SSN for the car visual

Car	Red		Yellow		Green		Blue		Black		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
PS	4	11	3	8,3	5	14	6	17	3	8,3	3	8,3	1	2,8	4	11	4	11	36	
School Level	PriS	25	16	9	5,6	24	15	25	16	17	11	11	6,9	13	8,1	10	6,3	16	10	160
	SS	23	13	21	12	26	15	31	18	9	5,3	14	8,2	13	7,6	12	7	14	8,2	171
	VT	28	15	24	13	25	14	38	21	10	5,5	17	9,3	5	2,7	9	4,9	19	10	182
Total	80	15	57	10	80	15	100	18	39	7,1	45	8,2	32	5,8	35	6,4	53	9,7	549	

* PS: Pre-school, PriS: Primary School, SS: Secondary School, VT: Vocational Training

It is clear in Table 6 that the colors blue and green were preferred by 6 (17%) and 5 pre-school students (14%) to paint the car, respectively. At the primary level, while 25 students (16%) favoured red and blue, 24 students (15%) opted green to paint the car. Regarding secondary school level, 31 students (18%) chose blue, and it was green for 26 students (15%). Furthermore, 38 students (21%) from vocational training center preferred blue, and the color red was chosen by 28 students (15%) to paint the car. When evaluated in general, while 100 SSN (18%) preferred blue, 80 SSN (15%) used the colors red and green to paint the car.

In the seventh sub-problem of the study, the answer to the question "What are the color preferences of SSN for the circle according to the disability type?" was sought. Table 7 shows the color preferences of the students.

Table 7: The color preferences of SSN for the circle according to the disability type

Circle	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Disability Type	ID	63	16	62	16	67	17	63	16	30	7,5	23	5,8	29	7,3	43	11	400
	ASD	20	24	10	12	12	14	10	12	6	7,1	4	4,7	4	4,7	9	11	85
	DS	4	7,1	7	13	15	27	11	20	3	5,4	3	5,4	3	5,4	2	3,6	56
	LD	1	13	2	25	2	25	1	13	0	0	0	0	1	13	0	0	8
Total		88	16	81	15	96	17	85	15	39	7,1	30	5,5	37	6,7	54	9,8	549

When Table 7 is looked through, it is seen that of the students with ID, 67 (17%) preferred green, and red and blue were favoured by 63 (16%) to paint the circle. As for the students with ASD, 20 students (24%) chose red, whereas 12 students (14%) opted green in painting the circle. 15 students with DS (27%) chose green while 11 students with DS (20%) used the color blue. Additionally, 2 students with LD (25%) preferred yellow and green to paint the circle shape. In general, 96 students (17%) chose green, 88 students (16%) opted red, and it was blue for 85 students (15%) to paint the circle shape in all disability types.

In the eighth sub-problem of the study, the question "What are the color preferences of SSN for the square according to the disability type?" was answered. The color preferences of students are shown in Table 8.

Table 8: The color preferences of SSN for the square according to the disability type

Square	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		White		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Disability Type	ID	50	13	56	14	79	20	61	15	28	7	23	5,8	23	5,8	48	12	1	0,3	400
	ASD	15	18	13	15	13	15	5	5,9	8	9,4	4	4,7	8	9,4	7	8,2	4	4,7	85
	DS	4	7,3	7	13	14	25	9	16	5	9,1	2	3,6	4	7,3	7	13	0	0	56
	LD	1	13	2	25	1	13	2	25	0	0	0	0	0	0	2	25	0	0	8
Total		70	13	78	14	107	21	77	14	41	7,5	29	5,3	35	6,4	64	12	5	0,9	549

As it is indicated in Table 8, of the students with ID, 79 students (20%) chose green, 61 students (15%) preferred blue, and 56 students (14%) used the color yellow to paint the square. With respect to the students with ASD, 15 students (18%) opted red, whereas 13 students (15%) favoured yellow and green to paint the square. While 4 students with DS (25%) preferred green, it was blue for 9 students with DS (16%). Moreover, 2 students with LD (25%) preferred yellow, blue, and orange to paint the square. It is seen that there was no change in the colors preferred by the students with ID, students with ASD, and students with DS to paint the circle and square. None of the students with LD chose the colors brown and pink for either shape. While none of the students with LD preferred orange for the circle, 2 students with LD (25%) chose it for the square. While none of the students preferred white for the circle in all disability groups, 1 student with ID (0.3%) and 4 students with ASD (4.7%) painted the square with white. When evaluated in general, it is seen that 107 of the students (21%) preferred green, 78 of the students (14%) opted yellow, and 77 of the students (14%) used blue.

In the ninth sub-problem of the study, an answer was sought to the question "What are the primary color preferences of SSN according to the disability type?" The color preferences of the students are displayed in Table 9.

Table 9: The primary color preferences of SSN according to the disability type

Primary		Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
Disability Type	ID	71	18	63	16	62	16	64	16	26	6,5	32	8	22	5,5	42	11	400
	ASD	17	20	5	5,9	10	12	8	9,4	9	11	3	3,5	9	11	12	14	85
	DS	5	8,9	9	16	7	13	12	21	5	8,9	4	7,1	2	3,6	4	7,1	56
	LD	1	13	0	0	0	0	3	38	1	13	0	0	2	25	0	0	8
Total		94	18	77	14	79	14	87	16	41	7,5	39	7,1	35	6,4	58	11	549

As it is shown in Table 9, the colors red (71 students (18%)), blue (64 students (16%)), and yellow (63 students (16%)) were preferred by the students with ID as the primary color. Of the students with ASD, 17 students (20%) chose red, 12 students (14%) opted orange, and 10 students (12%) favoured green. In addition, the colors blue (12 students (21%)), yellow (9 (students 16%)), and green (7 students (13%)) were chosen by the students with DS as the primary color. It is evident that 3 students with LD (38%) preferred blue, whereas 2 students with LD (25%) opted purple as the primary color. In general, 94 students (18%) preferred the color red, 87 students (16%) favoured blue, and it was green for 79 students (14%).

In the tenth sub-problem of the study, the researchers tried to answer the question "What are the secondary color preferences of SSN according to the disability type?" The secondary color preferences of the students are shown in Table 10.

Table 10: The secondary color preferences of SSN according to the disability type

Secondary		Red		Yellow		Green		Blue		Brown		Purple		Skin Color		Orange		T
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
Disability Type	ID	31	7,8	53	13	58	15	90	23	36	9	23	5,8	20	5	48	12	400
	ASD	12	14	9	11	18	21	8	9,4	7	8,2	8	9,4	2	2,4	8	9,4	85
	DS	5	8,9	7	13	10	18	9	16	6	11	3	5,4	6	11	3	5,4	56
	LD	0	0	0	0	2	25	3	38	0	0	0	0	0	0	2	25	8
Total		48	8,7	69	13	88	16	110	20	49	8,9	34	6,2	28	5,1	61	11	549

As Table 10 shows, the colors blue (90 students (23%)), green (58 students (15%)), and yellow (53 students (13%)) were chosen as the secondary color by students with ID. As for the students with ASD, they preferred the colors green (18 students (21%)) and red (12 students (14%)). Of the students with DS, 10 (18%) preferred green, whereas 9 (16%) favoured blue as the secondary color. Furthermore, 3 (38%) of the students with LD preferred blue while 2 (25%) of the students from the same group opted green and orange as the secondary color. Overall, 110 students (20%) preferred the color blue, 88 students (16%) chose green, and it was yellow for the 69 students (13%).

In the eleventh sub-problem of the study, an answer was sought to the question "What are the color preferences of SSN to paint an object according to the disability type?". Table 11 displays the color preferences of the students.

Table 11: The color preferences of SSN for the car visual according to the disability type

Car	Red		Yellow		Green		Blue		Black		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
ID	61	15	47	12	59	15	80	20	22	5,5	34	8,5	22	5,5	26	6,5	37	9,3	400	
Disability Type	ASD	14	16	7	8,2	13	15	13	15	11	13	2	2,4	5	5,9	6	7,1	4	4,7	85
	DS	5	8,9	3	5,4	8	14	4	7,1	5	8,9	7	13	5	8,9	3	5,4	10	18	56
	LD	0	0	0	0	0	0	3	38	1	13	2	25	0	0	0	0	2	25	8
Total	80	15	57	10	80	15	100	18	39	7,1	45	8,2	32	5,8	35	6,4	53	9,7	549	

When Table 11 is looked through, it is clear that the colors preferred by the students with ID to paint the car visual were blue (80 students (20%)), red (61 students (15%)), and green (59 students). While 14 students with ASD (16%) chose red, 13 students from the same group (15%) favoured green and blue. Of the students with DS, 10 students (18%) used orange, 8 students (14%) preferred green, and 7 students (13%) chose brown for the car object. It is obvious that 3 students with LD (38%) preferred blue, whereas 2 students from the same group (25%) opted brown and orange. In general, 100 students (18%) painted the car in blue, 80 students (15%) used the color red, and 80 students (15%) preferred green.

In the twelfth sub-problem of the study, the question "What are the color preferences of SSN for the geometric shapes according to their gender?" was answered. The color preferences of the students are shown in Table 12.

Table 12: The color preferences of SSN for the circle according to the gender

Circle	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Gender	Male	53	17	44	14	61	19	51	16	22	6,9	14	4,4	21	6,6	30	9,434	318
	Female	35	15	37	16	35	15	34	15	17	7,4	16	6,9	16	6,9	24	10,39	231
Total	88	16	81	15	96	17	85	15	39	7,1	30	5,5	37	6,7	54	9,836	549	

As it is displayed in Table 12, male students preferred the colors green (61 students (19%)), red (53 students (17%)), and blue (51 students (16%)) to paint the circle. On the other hand, female students chose the colors yellow (37 students (16%)), and red and green (35 students (15%)) to paint the circle. When it is evaluated in general, it is seen that 96 students (17%) painted the circle in green, 88 students (16%) used red, and 85 students (15%) preferred blue to paint it.

In the thirteenth sub-problem of the study, the researchers tried to answer the question "Do the color preferences of SSN change when the shape changes according to their gender?" The color preferences of the students are shown in Table 13.

Table 13: The color preferences of SSN for the square according to the gender

Square	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Gender	Male	40	13	52	16	61	19	44	14	25	7,9	19	6	16	5	31	9,8	318
	Female	30	13	26	11	46	20	33	14	16	6,9	10	4,3	19	8,2	33	14	231
Total	70	13	78	14	107	21	77	14	41	7,5	29	5,3	35	6,4	64	12	549	

According to Table 13, male students preferred the colors green (61 students (19%)), yellow (52 students (16%)), and blue (44 students (14%)), whereas female students chose the colors green (46 students (20%)), and blue and orange (33 students (14%)) to paint the square. It was found that male students preferred green more to paint the circle and square. There was no change in the status of green and blue. It can be seen that while there was no change in the preferences of female students in terms of green color, there was a partial change in their choice of other colors. While 24 female students preferred the color orange to paint the circle, the same color was preferred by 33 female students to paint the square. Similarly, the color pink was preferred by 16 female students to paint the circle whereas the same color was chosen by 10 female students to color the square. Overall, it is seen that 107 students (21%) preferred green, 78 students (14%) opted yellow, and the color blue was favoured by 77 students (14%).

In the fourteenth sub-problem of the study, the question "What are the primary color preferences of SSN according to their gender?" was answered. The color preferences of the students are displayed in Table 14.

Table 14: The primary color preferences of SSN according to their gender

Primary	Red		Yellow		Green		Blue		Brown		Pink		Purple		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Gender	Male	51	16	53	17	45	14	48	15	28	8,8	24	7,5	20	6	30	9,4	318
	Female	43	19	24	10	34	15	39	17	13	5,7	15	6,5	15	7	28	12	231
Total		94	18	77	14	79	14	87	16	41	7,5	39	7,1	35	6	58	11	549

As it is indicated in Table 14, while male students preferred the colors yellow (53 students (17%)), red (51 students (16%)), and blue (48 students (15%)), female students chose red (43 students (19%)), blue (39 students (17%)), and green (34 students (15%)) as the primary color. In general, 94 students (18%) preferred red, and 87 students (16%) chose blue as their primary color. It was the color green for 79 students (14%).

In the fifteenth sub-problem of the study, the answer to the question "What are the secondary color preferences of SSN according to their gender?" was sought. Table 15 shows the color preferences of the students.

Table 15: The secondary color preferences of SSN according to their gender

Secondary	Red		Yellow		Green		Blue		Brown		Purple		Skin Color		Orange		T	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
Gender	Male	30	9,4	39	12	51	16	60	19	30	9,4	20	6,3	17	5,3	37	12	318
	Female	18	7,8	30	13	37	16	50	22	19	8,2	14	6,1	11	4,8	24	10	231
Total		48	8,7	69	13	88	16	110	20	49	8,9	34	6,2	28	5,1	61	11	549

When Table 15 is looked through, it is seen that male students preferred the colors blue (60 students (19%)), green (51 students (16%)), and yellow (39 students (12%)), whereas female students chose blue (50 students (22%)), green (37 students (16%)), and yellow (30 students (13%)) as the secondary color. In addition, it was found that both male and female students had the same color preference as the secondary color. In general, 110 students (20%) preferred the color blue while 88 students (16%) chose green as the secondary color. The color yellow was favoured by 69 students (13%) as the secundar color.

In the sixteenth sub-problem of the study, an answer was sought to the question "What are the color preferences of SSN to paint an object according to their gender?". The color preferences of the students are given in Table 16.

Table 16: The color preferences of SSN for the car according to their gender

Car		Red		Yellow		Green		Blue		Black		Brown		Purple		Orange		T
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
Gender	Male	47	15	33	10	43	14	55	17	24	7,5	27	8,5	20	6,3	31	9,7	318
	Female	33	14	24	10	37	16	45	19	15	6,5	18	7,8	15	6,5	22	9,5	231
Total		80	15	57	10	80	15	100	18	39	7,1	45	8,2	35	6,4	53	9,7	549

As Table 16 indicates, while male students preferred the colors blue (55 students (17%)), red (47 students (15%)), and green (43 students (14%)), female students used the colors blue (45 students (19%)), green (37 students (16%)), and red (33 students (14%)) to paint the car visual. Overall, 100 students (18%) used the color blue, whereas 80 students (15%) opted red to paint the car visual. The color green was preferred by 80 students (15%).

In the seventeenth sub-problem of the study, the researchers attempted to answer the question "What are the color preferences of SSN according to all cases?". The color preferences of the students are shown in Table 17.

Table 17: The color preferences of SSN according to all cases

	Red		Yellow		Green		Blue		Black		Brown		Pink		Purple		Orange	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Circle	88	16	81	15	96	17	85	15			39	7	30	6	37	7	54	10
Square	70	13	78	14	106	19	77	14			41	8	29	5	35	6	64	12
I	93	17	77	14	79	14	87	16			41	8			35	6	58	11
II	48	9	69	13	88	16	110	20			49	9			28	5	61	11
Car	80	15	57	10	80	15	100	18	39	7	45	8			35	6	53	10
Total	379	70	362	66	449	81	459	83	39	7	215	39	59	11	170	31	290	54

* I: Primary Color, II: Secondary Color

As it is displayed in Table 17, SSN preferred the colors green (96 students (17%)), red (88 students (16%)), and blue (85 students (15%)) to paint the circle shape. None of the students painted the circle shape in black. To paint the square shape, while 106 students (19%) preferred green, 78 students (14%) chose yellow. The color blue was favoured by 77 students (14%) to paint it. As it was the case for the circle, none of the students preferred black to paint the square shape. As the primary color, 93 students (17%) preferred red, whereas 87 students (16%) opted blue. The color green was chosen by 79 students (14%) as the primary color. Black and pink colors were not preferred by SSN as the primary colors. With respect to the secondary color, it was found that the colors blue (110 students (20%)), green (88 students (16%)), and yellow (69 students (13%)) were preferred. As it was the case for their primary color preferences, SSN did not prefer black and pink as the secondary color. In addition, the colors blue (100 students (18%)), red (80 students (15%)), and green (80 students (15%)) were preferred to paint the car visual. None of the students painted the car in pink. When it is evaluated in general, while the colors blue (459; 83%) and green (449; 81%) were the most preferred colors, students chose black (39; 7%) and pink (59; 11%) colors the least in all cases.

DISCUSSION, CONCLUSION AND IMPLICATIONS

This study aimed to explore the color preferences of SSN, and the findings were discussed and interpreted in connection with the results of the related studies in the literature. In line with the data obtained from this study and considering the contribution of the knowledge on color preferences of SSN, some suggestions have been made.

The colors preferred by SSN when painting the circle differed according to their school level, and students preferred the colors green and red the most. More specifically, at the pre-school level, students preferred green and red, whereas the color green was favoured by the students from primary school. It was also found that students from both secondary school and vocational training center chose green the most. In the literature, it has been expressed that young children mostly prefer bright colors, but their preference changes to pastel colors and tones in primary school years. Then, in secondary school years, color preference of students turns into cool colors such as green-blue. The color preference of high school students evolves towards darker colors such as claret red, gray, dark blue, dark green, dark turquoise, and violet (Gale, 1933). Corresponding to the related literature on the color preferences, the findings of this study revealed that SSN preferred green, as one of the cool colors, more to paint the circle shape. The green color has the effect of relaxing the nervous system and reducing the feeling of stress. It also contributes to the development of communication and speaking skills of individuals. Çelik (2009) stated that children with ID, who prefer green color, are in harmony with their environment.

With respect to the circle shape, the color green was preferred more by preschool students, primary school students, and secondary school students, and the color yellow and green were chosen more by the students from vocational training center. In light of this, it was found that the primary color preference of the students changed partially when the shape changed, and that students preferred cool colors more as it was the case for the circle shape. According to school level, the study showed that the preference of SSN for some colors changed when the shape changed. When painting the circle and square shapes, preschool students preferred brown; students from primary school chose pink, red, and brown; secondary school students favoured pink; and students from vocational training center used the color purple. That is, there was a change in students' color preferences to paint the circle and square shapes. It is possible to associate this situation with the fact that the colors that SSN prefer to paint geometric shapes are psychologically relaxing. It can be discussed that if the visuals to be hung on the walls and the activities to be prepared are in the form of a circle or square, teachers' preference to use the green color for these can attract students' attention and facilitate their motivation in learning-teaching environments.

Regarding school level, the colors blue (by the students from preschool), red (by the students from primary and secondary school), and yellow (by the students from vocational training center) were preferred as the primary color the most, whereas the colors green (by the students from preschool and secondary school) and blue (by the students from primary school and vocational training center) were chosen as the secondary color the most. Incompatible with the findings of the present study, investigating the drawings of children, Alschuler and Hattwick (1947) found that young children prefer warm colors, whereas older children prefer cool colors. Furthermore, the current study revealed that in the pre-school period, children mostly prefer red, that is, the warm color; and as they get older, their interest in red decreases, and they start to be keen on cool colors more. Studies have indicated that red is the most favorite color for children (Sharpe, 1980), and that the color preference of children changes as they grow up, and their preference moves towards blue (Katz & Breed, 1922). Although it has been underscored that color preference is a situation that changes according to age, it is seen in this study that the colors preferred by SSN are cool colors. It can be claimed that taking into account the cool colors that SSN prefer, like, and have a positive reaction to in teaching contexts can be effective to make it easier for students to recall the knowledge they have learned and keep their attention. Likewise, it is reasonable to express that it may be beneficial for parents to prefer colors such as green and blue when they want to create a calming environment and to create positive mood and an effect to improve the behaviors of SSN in their home. Providing educational environments with

consciously chosen stimulants for students with special needs is important for their healthy development. On the color wheel, red represents movement and vitality. Orange, on the other hand, symbolizes strength, joy, wisdom, creativity, confidence, courage and endurance. At the same time, orange has a relaxing and stimulating feature (Sözen, 2003). However, orange, which has a positive effect on the socialization of individuals, has a negative effect on the nervous system when used excessively. Yellow represents hope, joy, humility, and wisdom. It is inspiring as well. Green symbolizes the hope for life. It has a soothing, confidence and peace giving feature (Bozkurt, 2004). Blue represents talent, beauty, peace, love and freedom. Excessive emotionality, dreaminess, being in constant search are the negative qualities of the blue color. Last but not least, purple symbolizes nobility, self-confidence, spiritual energy, tolerance and intuition (Çağan, 2005).

To paint the car visual, while the color blue was preferred by the students from three different school levels (i.e., pre-school, secondary school, and vocational training center), primary school students chose red to paint it. Colomb (1990) states that five-year-old children usually use one color when painting family or human figures, but when asked to paint a garden, they often use a larger number colors and do not change the existing color, especially when drawing distinctive objects. School age is a very effective period for children to meet various colors and establish emotional bonds (Zentner, 2001). SSN have developed different color preferences at different education levels, and they have learnt the colors and have associated the colors with the objects they like. Within this context, it is highly possible that as SSN may have encountered the cars in blue more in their daily life, they have associated the car with the color blue.

To paint the circle, the color green was preferred by the students with ID and DS, whereas students with ASD used red. Students with LD chose yellow and green to paint it. When the shape was changed, and the students were asked to paint the square shape, the students with ID favoured green while students with ASD opted red as it was the case for the circle. There was no change in the color preferences of students with ID, students with DS, and those with ASD. When the shape was changed, the color preference of the students with LD changed, accordingly. That is, while none of the students preferred orange to paint the circle, there were students who chose orange when painting the square. Even though it has stated in the related literature that students with ID prefer warm colors more (Çelik, 2009), it is salient that SSN preferred green color in the current study. Equally important, although the colors such as red, yellow, and orange can have the effect of causing anger or furiousness for the students with ASD because these colors provide high levels of stimulus, SSN in this study preferred these colors to paint a geometric shape. Having found that pictorial intervention helped SSN focus and develop communication skills, Mirinda (1990) and Winner (1993) explored the effects of strategies such as using familiar pictures such as a tree, cat, dog, and house and employed symbols such as colored circles and especially combined these objects with bright colors to enable students to focus. In this way, it has been reported that students with ASD focus more on their lesson and behave more sensitively (Winner, 1993). The fact that the students with ID and students with ASD chose different colors than expected may be by chance, and it can be interpreted as the students chose the color they saw to paint the objects. In fact, while students with typical development make the color preferences consciously, this preference can be made randomly by SSN. Therefore, further studies should be conducted to determine the color preferences of SSN in order to obtain more general results.

Regarding the primary color preferences of SSN, students with ID and those with ASD preferred red, whereas students with DS and those with LD opted blue. Dutchzak (1985), in his research with students with severe physical and mental disabilities, found that green color contributes to development, and blue color provides relaxation. Çelik (2008) found that students with ID mostly preferred red in their single-color preference, and students with DS chose orange while in a similar study, Ece and Çelik (2008) discovered that students with LD preferred red, and students with DS chose orange the most. In their research on the color preferences of the students with ASD, Grandgeorge and Masataka (2016) explored that students preferred the color red the most. When compared the findings of the abovementioned studies, there is a congruence with the findings of the students with ID in this study, and yet, it was found that the color preferences of the students with other disability types differ. Overall, the color preferences of the students with ID and those with ASD

focused mainly on warm colors, whereas the students with DS and those with LD were dominated by cool colors.

As for the secondary color preferences of SSN, while the students with ID and those with LD preferred blue, the students with ASD and those with DS chose green. It was revealed that there was a change in the primary and secondary color preferences of the students with ID, students with ASD, and those with DS, whereas the color preference of the student with LD was the same. Inconsistent with the findings of the present study, Çelik (2009) found that the colors orange and yellow were preferred the most by the students with ID and those with DS as their secondary color preference, respectively. It can be discussed that the determination of the colors mostly-preferred by SSN and incorporation of these colors into learning environments can guide teachers in planning teaching activities, designing instructional materials and increasing the efficiency of learning-teaching activities.

With regard to the color preferences of SSN to paint the car visual, the color blue was preferred by the students with ID and those with LD. Students with ASD opted red, and students with DS chose orange to paint it. Çağlayan (2014) stated that the inclusion of the works that contribute to affective and psychomotor development of students in the Art lessons help SSN make better preferences in line with their senses and emotions. In painting any object, students make choices based on their past experiences and senses. For example, such information as the sky is blue and the tree is green is reflected in the preferences of students, and this cognitive knowledge combines with the affective ones to form the students' preferences. Cockeril and Miller (1983), in their study to determine the effect of color on the performance of motor skills tasks, asked children to do tasks determined by the researchers by wearing glasses with four different colors in blue, green, yellow and red. As a consequence, they concluded that if the children used their preferred glasses, they could perform the tasks more efficiently, in a shorter time, and with fewer mistakes.

To paint the circle shape, male students preferred green, red, and blue, whereas female students chose yellow, red, and green. This indicates that while male students preferred cool colors, female students preferred warm colors. When the students were asked to paint the square shape, there was no change in the color preference of male students as they chose green and blue again. It was found that female students preferred green as the secondary color. In her study, Çığa (2001) concluded that healthy girls, aged between five and eleven, prefer yellow, red, pink and blue most in their clothes. With respect to gender, it can be expressed that the cool color preferences of male students continued, but female students switched from a warm color to a cool color. In light of these findings, it can be claimed that taking into account the color preferences of male and female SSN for the items such as clothes, jewelry, buckles that they use in their daily lives or for teaching the skills such as letters and numbers in academic fields can facilitate the acquisition of skills.

The primary color preferences of male students were yellow, red, and blue. On the other hand, female students preferred red, blue, and green as the primary color. Regarding the secondary color, male students favoured blue, green, and yellow whereas female students preferred blue, green, and yellow. It was found that there was a partial change in the primary and secondary color preferences of the students in terms of gender. Çelik (2009) discovered that, in the first phase, both male and female students preferred the color red as the primary color preference, and in the second phase, similarly, female students chose red, and male students opted yellow color. In general, it was revealed that female and male students mostly preferred warm colors (yellow and red) as the primary color. It is remarkable that the color preferences of both female and male students were the same as the secondary color preferences, and that they preferred cool colors.

Male students preferred blue, red, and green colors to paint the car visual. Likewise, female students preferred the color blue to paint the car visual, and then they chose green and red colors the most and painted the car visual. The fact that both male and female students preferred blue to paint the car visual can be associated with the students' past experiences or lives. Considering that students can remember an object they know in their daily lives and transfer it to their pictures, it can be thought that

they remember the cars in blue color and reflect it on their color preferences. Given that the color blue is generally attributed to men in social life, the result of the study demonstrated that gender is not an effective factor in the color preference of SSN, as it is the case for typical children.

Overall, in light of the findings of the current study, it was seen that SSN preferred green the most for painting both the circle and square shapes. For both shapes, black was not among the color preferences of the students. The primary color preferences of the students were mostly red, whereas their secondary color preference was blue. It was obvious that SSN did not prefer black and pink colors as both the primary and secondary colors. SSN painted the car visual using blue the most, but none of them preferred the color pink. Considering all cases, SSN preferred the colors blue and green the most, whereas they chose black and pink the least.

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