

# Visual Interest of Children with Autism in Interior Elements in the Room

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## Abstract

Children with autism spectrum disorder (ASD) can find it very difficult to focus on things that do not interest them or things with too much distraction. Distraction can be received by the senses, senses of sight, smell, hearing, and other senses. Of the various senses, the visual aspect is the most robust sense possessed by children with ASD. Therefore, this study aims to determine the visual interest (sense of sight) of children with autism in interior spaces, especially in therapy rooms. The method used is quantitative. The research location is in a hospital in Bandung. The research object is eight children with autism with the category of low function, difficulty to focus, and low imitation ability with an age range of 3-12 years old. Observations were made by watching video recordings from the ceiling of the therapy room and the front of the child (toward the child's eyes) during one therapy session when the child with autism was alone in the therapy room and when she/he was with the therapist in the therapy room. The significance test was carried out using a one-tail t-test and a single-factor ANOVA test. The results show that the most visually appealing interior elements for the eight children with autism are windows, clocks, doors, and poles. Besides, the average visual interest in windows, clocks, and doors increases when they were alone compared to when they were with a therapist. The conclusion is that every child has different visual interests, but there are similarities of interests with a therapist. During the therapy, children still find it challenging to focus on the material because they look at various directions of the room that the child finds attractive so that the therapy process does not run optimally. This finding means that the more objects/interior elements in the room, the greater the visual distraction they will create. Thus, interior design for children with autism should also be adjusted to their easily distracted behavior (from a visual perspective) to carry out effective and maximum therapeutic activities.

**Keywords:** Visual interest, children with ASD, interior, space

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## 1. Introduction

Autistic disorder is the most common form of autism spectrum disorder (Abdalla, 2007) and can occur in all races, ethnicities, and backgrounds (Johnson, 2011). The areas of impaired development are social interactions, communication/language, behavior, cognition, motor skills, emotions, sensory, and perception. Children with autism can find it very difficult to focus/get distracted on the things that interest them. Visual distraction on walls, doors, and tables can distract children with autism, and they will have difficulty focusing when there is verbal instruction from a therapist (Wildes, 2005). Most children with autism have better visual memory than audial memory (Hodgdon, 1999). The visual aspect is the most robust sense possessed by children with autism.

Children with autism spectrum disorder (ASD) can find it particularly difficult to focus on things that do not interest them. Some examples are the activities that involve mutual attention, such as reading a book with a nurse, doing puzzles, or even walking safely across the street (RCN, 2016). However, children with autism can still pay attention to the things they like. So, educational therapy methods are given by the child's condition.

In children with autism, one area of impaired development is perception. Also, the visual aspect is the most robust sense that children with autism have. Therefore, this study aims to determine the visual interest (direction of vision) of children with autism towards interior elements in the therapy room.

## 2. Literature Study

### Autism

Autism, from a psychological point of view, is a disorder of prolonged communication skills that appears in the first three years of age. This inability to communicate is thought to result in children with autism having a world of their own or being alone and unable to interact/respond to others (Sarwindah, 2002). Autism in a therapist's perspective (Personal Communication, 2017) is a disorder of developmental barriers, communication, and social interactions to varying degrees. Autism from a psychiatric perspective (Personal Communication, 2017) is also known as an autism spectrum disorder. There are three main characteristics of autism: communication, interaction, and specific behavior.

### Visual Perception of Children with Autism

Research shows that children with autism have problems understanding the environment around them (Swanson in Sakya, 2017). Children with autism are visual learners (Rao and Gagie, 2004). Visual disturbances can be prevented by putting a cover on the window (Vogel in Sakya, 2017). Visual disturbances on walls, doors, and desks can distract children with autism, such as when they have difficulty focusing on the presence of verbal instruction from a therapist (Wildes, 2005). Individuals with autism can observe details very well, especially visual details (Mesibov et al., 2004).

### 3. Methodology

The method used is qualitative. The study was conducted in one of the therapy rooms in Bandung hospital with a room size of 2 m long x 2 m wide x 3 m high. The research objects are eight children with autism with low function, difficulty in focusing, low imitation ability, and aged 3-12 years old. Observations were made by watching the video recordings from the ceiling of the therapy room and the video recordings on the front of the child (placed on the front wall) during one therapy session (45 minutes). The observations were conducted when the child with autism was alone in the therapy room, and when she/he was with a therapist (the therapist is in front of the child) in the therapy room. The observations' results are analyzed in the form of a room plan sketch (top view).

A significance test was carried out using a one-tailed t-test to determine whether there is a significant difference between children's visual interest when they are alone and when they are with a therapist. Besides, a single factor ANOVA test was conducted to determine whether there are significant differences in patterns (both with therapists and alone). The following is a plan of the therapy room along with a description of its interior elements (left image) and the child and therapist (right image).

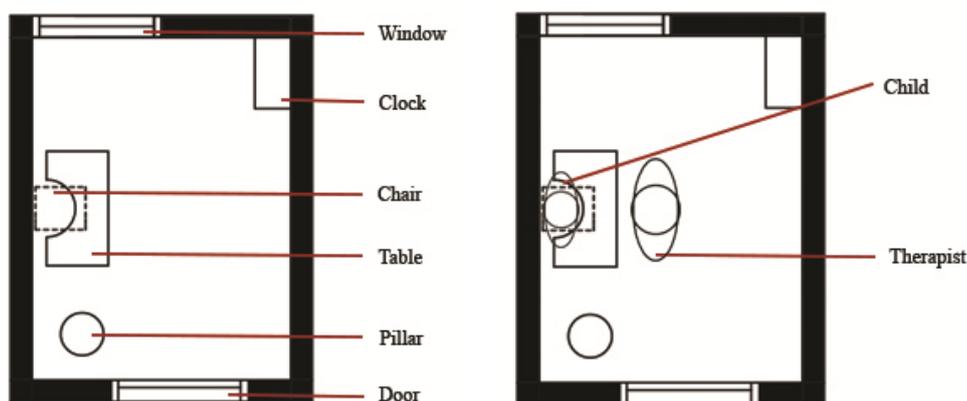


Figure 1. Plan of the Therapy Room  
Source: Personal Documentation (2017)

### 4. Data Analysis

The analysis was carried out by comparing the child with autism when she/he is alone in the therapy room, and when she/he is with a therapist in the therapy room. The arrows indicate the direction of the eyes/visual interest towards interior elements. A blue circle with a number indicates the frequency/number of times the child's eye/visual looks at that interior element.

1. Visual interest analysis of the first child when she/he was alone, and when she/he was with the therapist in the room can be seen in Figure 2.

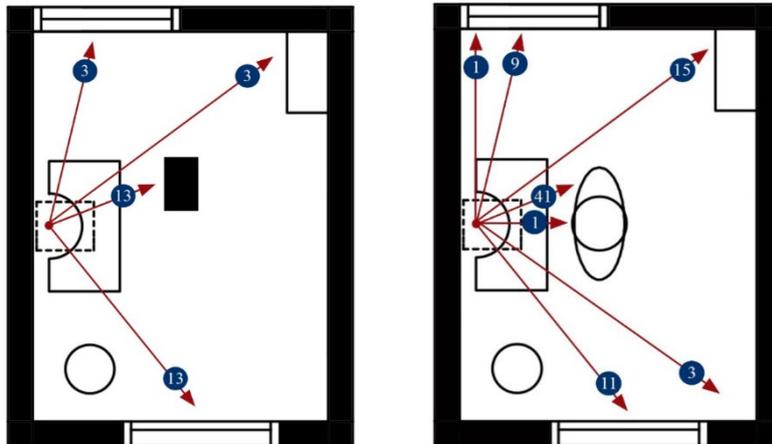


Figure 2. Visual Interest of the First Child  
Source: Personal Documentation (2017)

The child had a visual interest in doors and card boxes when she/he was alone. When the child was with the therapist, she/he had a visual interest in the clock in the front left corner. The child did not look to the right/pole at all.

2. Visual interest analysis of the second child when she/he was alone, and when she/he was with the therapist in the room can be seen in Figure 3.

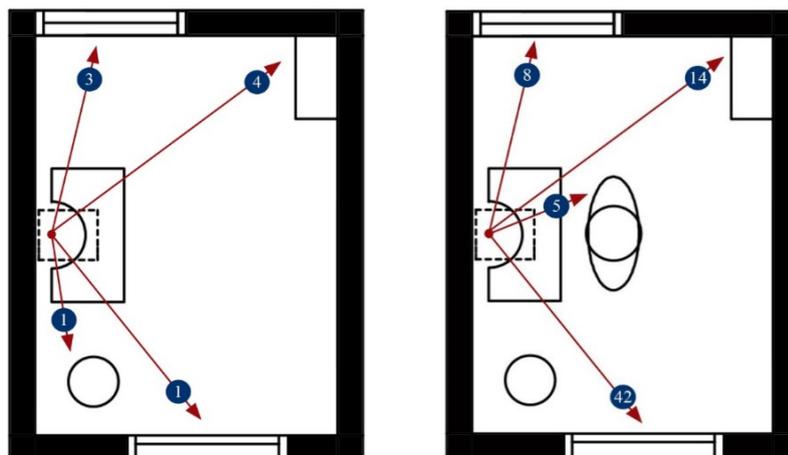


Figure 3. Visual Interest of the Second Child  
Source: Personal Documentation (2017)

The child had a visual interest in windows when she/he was alone. When the child was with a therapist, she/he had a visual interest in windows and clocks. The child did not look at the right front and right corner/pole at all.

3. Visual interest analysis of the third child when she/he was alone, and when she/he was with the therapist in the room can be seen in Figure 4.

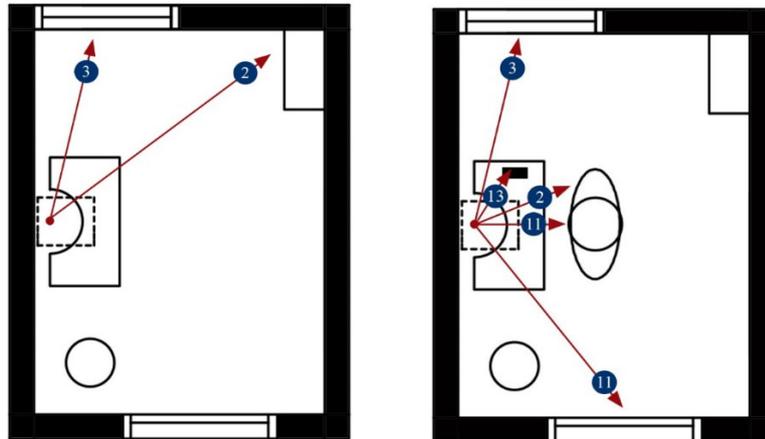


Figure 4. Visual Interest of the Third Child  
Source: Personal Documentation (2017)

The child had a visual interest in windows when she/he was alone. When the child was with a therapist, she/he had a visual interest in cell phones and doors. The child did not look at the front and right corner/pole at all.

4. Visual interest analysis of the fourth child when she/he was alone, and when she/he was with a therapist in the room can be seen in Figure 5.

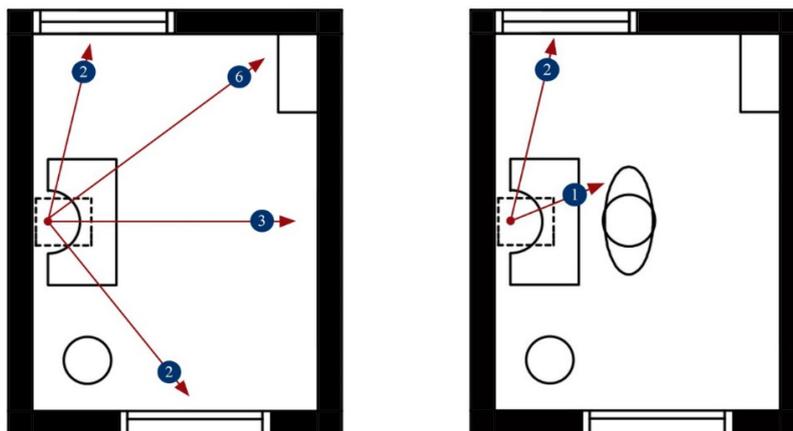


Figure 5. Visual Interest of Fourth Child  
Source: personal documentation (2017)

The child had a visual interest in clocks when she/he was alone. When the child was with a therapist, she/he has a visual interest in windows. The child did not look the other way at all.

5. Visual interest analysis of the fifth child when she/he was alone, and when she/he was with the therapist in the room can be seen in Figure 6.

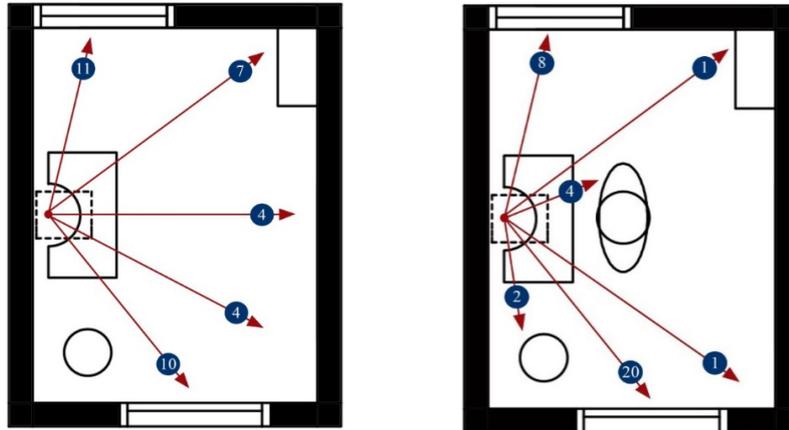


Figure 6. Visual Interest of the fifth Child  
Source: Personal Documentation (2017)

The child had a visual interest in doors and windows when she/he was alone. When the child was with the therapist, she/he had a visual interest in the door and looked around the room.

6. Visual interest analysis of the sixth child when she/he was alone, and when she/he was with the therapist in the room can be seen in Figure 7.

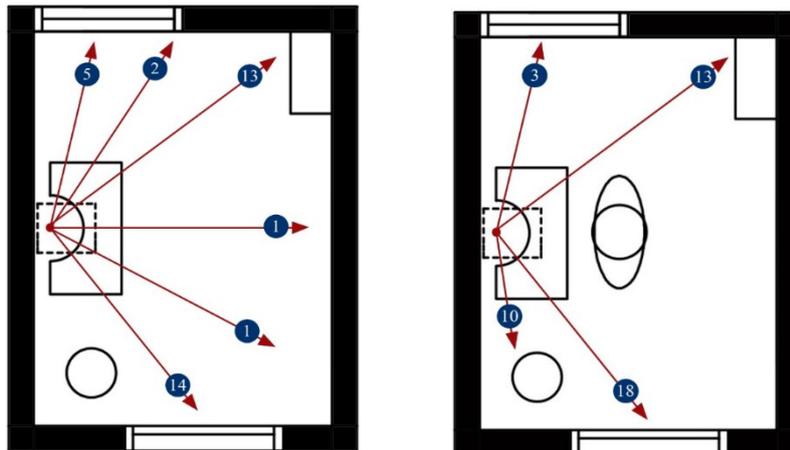


Figure 7. Visual Interest of the Sixth Child  
Source: personal documentation (2017)

The child had a visual interest in doors and clocks when she/he was alone. When the child was with the therapist, she/he had a visual interest in the clock and pole on the right.

7. Visual interest analysis of the seventh child when she/he was alone, and when she/he was with a therapist in the room can be seen in Figure 8.

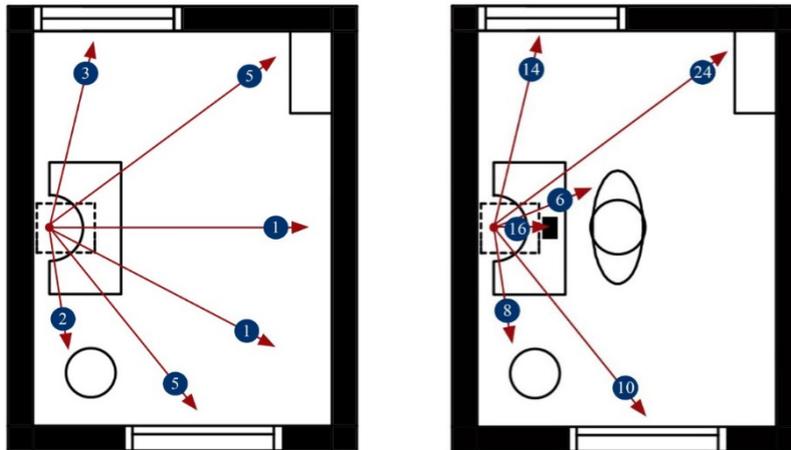


Figure 8. Visual Interest of the Seventh Child

Source: Personal Documentation (2017)

The child had a visual interest in clocks and doors when she/he was alone. When the child was with a therapist, she/he had a visual interest in clocks.

8. Visual interest analysis of the eighth child when she/he was alone, and when she/he was with the therapist in the room can be seen in Figure 9.

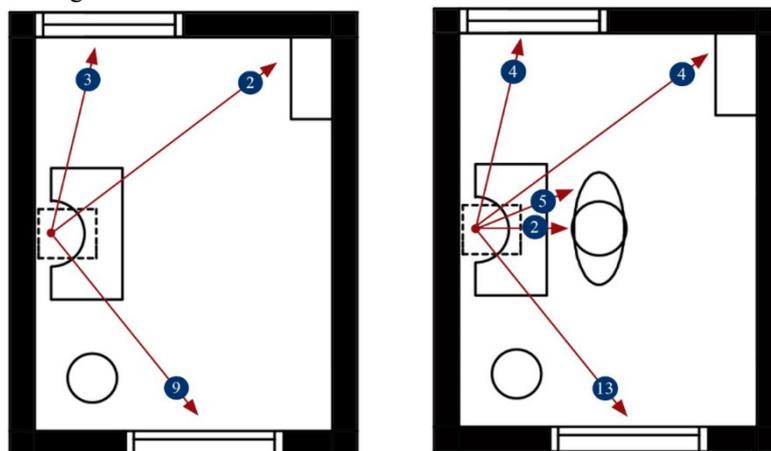


Figure 9. Visual Interest of the Eighth Child

Source: Personal Documentation (2017)

The child had a visual interest indoors when she/he was alone. When she/he was with a therapist, the child had a visual interest indoors. The child did not look at the pole on the right side at all.

### Significance Test of Visual Interest

A significance test was carried out using a one-tailed t-test (there was a difference in the number of children's behavior when alone and when they were with a therapist). The t-test results showed a significant difference between the number of interests of eight children when they were with the therapist and when they were alone with P-value = 0.025 (<0.05). The mean behaviors when the children were with the therapist = 2.625 and alone = 3.75. This finding shows that children's visual interest when they were alone increased compared to when they were with a therapist. It can be seen in table 1.

Table 1. Significance t-test of visual interest

	With Therapist	Alone
Mean	2.625	3.75
Variance	2.839285714	0.5
Observations	8	8
Pearson Correlation	0.629465182	
Hypothesized Mean Difference	0	
df	7	
t Stat	-2.346242607	
P(T<=t) one-tail	0.025685384	
t Critical one-tail	1.894578605	

Source: Personal Documentation (2017)

The interior elements that most visually attracted the eight children are windows, clocks, doors, and pillars. The significance test was carried out using a one-tailed t-test (there was a difference in the child's interior visual interest when she/he was with a therapist and when she/he was alone) by equalizing the period, which is 5 minutes. The results showed that the average visual interest in windows, clocks, and doors increased when she/he was alone compared to when she/he was with a therapist. However, the different significance appeared only in the visual interest in the door and clock. Visual interest in poles decreased on average when the child was alone compared to when they were with a therapist. It can be seen in table 2.

Table 2. Significance test of interior visual interest

Look at Window	With Therapist	Alone
Mean	2.875	3
P(T<=t) one-tail	0.428274125	
Look at Clock	With Therapist	Alone
Mean	1.75	4.25
P(T<=t) one-tail	0.02738109	
Look at Door	With Therapist	Alone
Mean	3.75	5.625
P(T<=t) one-tail	0.019755219	
Look at Pole	With Therapist	Alone
Mean	1.5	1.375
P(T<=t) one-tail	0.400915743	

Source: Personal Documentation (2017)

A single factor ANOVA test was performed to determine whether there were significant differences in patterns (both with therapists and alone) among the eight children. The ANOVA test results showed no significant difference in pattern among the eight children with P-value = 0.24 (> 0.05). This finding means that the eight children had the same pattern (both with a therapist and alone). It can be seen in table 3.

Table 3. Anova significance test of pattern differences (visual interest)

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	16.9375	7	2.41964	1.68323	0.24045	3.50046
Within Groups	11.5	8	1.4375			
Total	28.4375	15				

Source: Personal Documentation (2017)

## 5. Discussion

Every child has a different visual direction of interest. However, there is a similarity of attraction when she/he is with the therapist. Specifically, the child sees objects that the therapist is holding. This condition happens because the child is used to doing daily therapy. The therapist takes particular objects to be used as material for questions, and the child answers the therapist's questions. A pattern arises in the child's mind that they will be asked a question from something that the therapist holds, and the child must answer. During the therapy, it is still difficult for children to focus on the material because they look in various directions of the room that the child finds attractive (for example, a window) so that the therapy process does not run optimally.

How to make the child feel comfortable (the occurrence of interiority) before doing therapy, and how to

make the child ready physically and mentally to the room's conditions so that they can focus on the therapy process in that room? These questions will be reviewed in future studies. When the child is alone, she/he has a similar visual interest in looking at clocks, windows, and doors. This finding means that the more the objects/interior elements are in the room, the greater the visual distraction they will make.

## 6. Conclusion

The conclusion is that every child has different visual interests, but there are similarities of interest with a therapist. During the therapy, children still find it challenging to focus on the material because they look in various directions of the room that the child finds attractive so that the therapy process does not run optimally. This finding means that the more objects/interior elements are in the room, the greater the visual distraction they will create. In this case, the therapy room can be a good visual strategy. Thus, interior design for children with autism should also adapt to their easily distracted behavior (from a visual point of view) to carry out effective and maximum therapeutic activities.

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