A Deeper Understanding into a Child's Imaginative World

Introduction

As the saying goes, a picture is worth a thousand words. A drawing can be interpreted in many ways. Over the years studies have been conducted to try to find a pattern in understanding drawings, especially in children drawings (Patterson, 2011). Drawings come in handy when it comes to communicating with a child, they can facilitate children in talking about their feelings, emotions, or well-being. By observing the color, size, shape, and stroke of the drawing, people will be able to retrieve twice as much information from drawings compared to talking, starting as early as the age of 3 (Wesson, 2001). In other places such as hospitals, clinicians are able to make psychological observations on a child by interpreting their color (Crawford, 2012). Furthermore, color is a good indicator of a child's psychopathology (Crawford, 2012). In Crawford's (2021) study he/she conducted an experiment on children's preferences on colors vs. the emotional connection behind it. Children were asked to rank their favorite and least favorite color crayon and were asked to color in a blank man. Before coloring, they were told the man was either a "nasty man" or a "nice man". Results showed that the most frequent colors used on the "nice-man" were blue, red, and yellow, while the most frequently used colors on the "nasty-man" were black and brown (Crawford, 2021). These patterns of results show some indication of color emotion and are highly consistent with the results found in Burkitt (2003) findings.

A child's emotions may be associated with his/her temperament (Chetcuti, 2021). Temperament may be used to "characterize biologically-based, individual differences in affectivity, reactivity, and regulation, particularly within the childhood years" (McAdams, 1995). And according to Chetcuti, temperament may play a role in understanding the variety of ASD (Chetcuti, 2019). Chetcuti (2019) compared in this study the temperament traits between children with ASD and

TD, he/she found that the ASD group showed significantly higher levels of "negative affectivity/emotionality (2.34, $p < .001$, 95% CI = 1.06, 3.64) and significantly lower levels of self- regulation (− 2.10, $p = .003$, 95% CI = − 3.48, − 0.71) and sociability (− 1.12, $p = .028$, 95% CI = − 2.15, − 0.12) (Chetcuti, 2021)". Baile (2000) study compared the temperament between individuals with Fragile X syndrome, individuals with ASD had a more negative mood (Bailey, 2000). Other studies (Adamek, 2011. Bos, 2018. Barger, 2019) have also proven the correlation between negative affectivity/emotionality in children with ASD diagnosis, while some studies have disproved this association (Berkovits, 2017. Nazim, 2019). Nazim (2019) studies that it is rather an effort control rather than negative affectivity. This paper will attempt to confirm the relationship between negative temperament and ASD by comparing drawings from children with/without ASD.

Methods

For convenient sampling, 20 drawings from children with ASD will be retrieved from "CAR Art Gallery" and 20 drawings from children without ASD "GettyImages". The drawings are then divided into a 12x12 grid. The number of units each color covers is counted/calculated and the percentage is taken (Table 1 and Table 2). Once the percentages are presented, the average percentage of each color is calculated (Table 3). From there the calculation of the percentage of negative colors for Non-ASD/ASD populations is calculated.

Non-ASD Drawings (CAR Art Gallery)

ASD Drawings (Getty Images)

Results

Table 1. Percentage of each color in Non-ASD population

	Red	Blue	Yellow	Black	Brown
Drawing 1	8	40	0	5	0
Drawing 2	3	63	13	0	3
Drawing 3	0	62	23	18.5	0
Drawing 4	13	8	40	3	0
Drawing 5	14	10	12	17	0
Drawing 6	50	50	0	0	0
Drawing 7	12	9	4	0	2
Drawing 8	15	11	0	5	0
Drawing 9	14	10	9	3	0
Drawing10	0	12	9	0	0
Drawing11	6	4.5	9.6	0	3
Drawing12	0	6	4	0	0
Drawing13	0	6	3	0.5	1
Drawing14	0	10	7	6	3
Drawing15	5	4	3	4.5	0
Drawing16	8	13	7	0.3	0.1
Drawing17	5	24	15	0.5	0.2
Drawing18	1	6	5	5	0
Drawing19	0	3	0.2	5	2
Drawing20	4	6	7	2	2

Table 2. Percentage of each color in ASD population

	red	blue	yellow	black	brown
Drawing1	2	0	0	0	75
Drawing2	3	25	0	3	0
Drawing3	4	15	10	6	7
Drawing4	0	25	25	0	0
Drawing5	0	11	8	0	0
Drawing6	3	5	20	0	0
Drawing7	2	40	2	20	0

Drawing8	0	0	5	0	6
Drawing9	3	10	5	2	30
Drawing10	5	4	8	0	5
Drawing11	10	5	30	0	60
Drawing12	0	4	10	2	0
Drawing13	2	0	1	40.5	20.6
Drawing14	0	3	0	10	85
Drawing15	7	8	5	4	2
Drawing16	5	10	25	2	40
Drawing17	35	10	6	25	0
Drawing18	0.5	30	10	15	6
Drawing19	80	5	0	6	0
Drawing20	0	30	20	0	7

Table 3. Average Percentage (rounded to the nearest integer)

	No-ASD	ASD
Red	8	8
Yellow	9	10
Blue	18	12
Brown	1	9
Black	4	7
Total	40	46

*Percentage of negative colors for Non-ASD: 0.125

*Percentage of negative colors for ASD: 0.4

Conclusions

Based on the table and statistical analysis above, the percentage of negative colors for Non-ASD is 0.125 and the percentage of negative colors for ASD 0.4. These two values are statistically different. One limitation of the study is the sample population, and the subjectivity.

Although there is research proving generally higher levels of negative affective emotions in ASD people (Adamek, 2011), such a generalization will have its flaws. Some future directions are to assess the drawings not only on colors but other premises of the drawings for a more rigorous and valid analysis.

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