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Autism Spectrum Disorder as Reflected in Drawings

By: Inbal Bar, Merav Adler Gabriely, Orly Ashkenazi, and Gitit Shaviv, students in the Graduate School Of Creative Arts Therapies, University of Haifa.

The Draw-A-Person test (DAP), developed by Machover (1949), is a projection-drawing technique based on the idea that the drawn figure represents the individual, whereas the paper represents its surroundings. The goal of this study is to identify typical indicators that characterize the human figure in the autistic population compared with the normal population. To this end, two groups were sampled – the first included 8 mature individuals diagnosed with autism (study group) and the second included 8 mature individuals with no clinical diagnosis (control group). The subjects were asked to draw themselves on a piece of paper. Subsequently, three judges reviewed the drawings. Analyzing the data identified two indicators with significant differences. The first is the artistic development stage, as defined in Malchiodi's book (1997), where the autistic subjects were at a significantly lower stage. The second is the area of the drawn figure, where the autistic individuals drew a significantly larger figure in comparison to the control group. It can be suggested that these results are derived from several difficulties that characterize the autistic population, such as retardation and difficulties in forming connections with the external environment. In light of the significance of the results and the lack of sufficient data in the literature in the field of analyzing drawings of mature autistic people, there is a great importance in performing additional research aiming at investigating indicators that identify the drawings of the autistic population. This will help to develop a diagnostic tool for identifying autistic persons.

Keywords: Autism Spectrum Disorder, "Draw A Person" test, Machover, Projective Drawings, DAP, Artistic development, Art Therapy.

ASD

In 1943, Kanner published an article where he described 11 children who seemed to be absorbed in their own worlds. He also added that these children had minimal communication skills and they had an insistence for sameness, they could not tolerate changes to their environment. These children are known today as autistic (Kanner, 1943 in Koenig & Levine, 2011). There has been a lot of progress since then, today autism spectrum disorder (ASD) is recognized as a disorder and advances have been made in diagnosing and categorizing the disorder (Volkmar, State & Klin, 2009).

Koenig et al. (2010) explains that the Diagnostic and statistical manual of mental disorders (DSM-IV) has classified Pervasive Development Disorder (PDD) to include autism, Asperger's Disorder and Pervasive Development Disorder not otherwise specified (PDD-NOS). The DSM-IV categorizes three areas of impairment: 1) qualitative impairment in social interaction, 2) qualitative impairment in communication, and 3) restricted repetitive and stereotyped patterns of behavior, interests and activities.

One of the most significant problems with individuals with Autism Spectrum Disorder (ASD) is a social skills deficit. Autistic individuals have difficulty understanding or have an inappropriate performance of a skill (Stichter, Herzog, Visovsky, Schmidt, Randolph, Schultz & Gage, 2010). Wilson, Brock & Palermo (2010) suggest that

individuals with ASD exhibit a reduced preference for viewing social stimuli in the environment, making individuals with ASD less likely to engage in social interaction. Gabriels (2003) explains that young autistic children's apparent social difficulty can be observed in their lack of joint attention skills, meaning the ability to share attention with others.

Koinig et al. (2010) found that individuals with ASD also show impairment in interpreting facial expressions, difficulty interpreting non-verbal expressions (gestures, body posture), poor interpretation of social context, and reduced ability to self-moderate. They also have impaired social communication and social relationships, and may experience anxiety, depression, obsessive compulsive disorder and other psychiatric symptoms.

Some individuals demonstrate several autistic symptoms (including stereotypic mannerisms) and low IQ, while others have no significant mental impairment. These individuals are generally diagnosed with high functioning autism (HFA), Asperger's syndrome (AS) and PDD-NOS (Volkner et al. 2009). Individuals with ASD have problems understanding and maintaining friendships, as well as understanding and navigating through the complex social environment. In the case of HFA and AS, they feel the desire to interact socially, but lack the social skills to do so effectively (Stichter et al., 2010). AS and ASD demonstrate similar social impairments, including restricted interests and behaviors, but AS sufferers do not show cognitive impairment (Koening et al., 2010).

Individuals with HFA and AS have problems understanding social behavior, and although they can understand and recognize various basic facial expressions, they have difficulty understanding more complex emotions. They also have trouble in understanding and acknowledging the thought beliefs and feelings of others. All of these social impairments make it very difficult for individuals with ASD and AS to interact socially (Stichter at el., 2010).

This research intend to seek how those ASD characteristics, mentioned in the literature, are reflected in the self human figure drawings.

ASD and drawings

The "Draw a Person" (DAP) Test is a common projection test developed by Machover, who claims that the drawn figure relates to the impulses, anxieties, conflicts and compensations of the individual depicted. The drawing is also a projection of the individual's conception of his physical body and his or her emotions (Abraham, 2002). The DAP test was chosen because it by- passes the conscious mind, it is non-verbal, and is therefore suitable for a range of populations. By governing the process of projection, the drawer's personality is imprinted within the drawing (Abraham, 2002). Therefor the self figures drawings can uncover aspects of the ASD's self image and their perception of others.

When children draw pictures of human beings they reveal things about their intellectual and artistic abilities. They also show their awareness and conception of themselves and others (Lee & Hobson, 2006). In most cases, the drawing is a self-portrait wherein the paper represents the drawer's environment (Lev-wiesel, 2005). The larger the figure drawn on the paper, the less space the individual leaves for the environment. Furth explained the effects of autism on the use of space in drawing, as follows: "the drawings can be looked at as the individual's life, in-a-sense. Is it filled in or empty? How is the space used? Patients who are physical ill or psychologically lacking energy may not be able to fill the page. On the other hand, the page might be over-filled by a person whose energy is overflowing or who is perhaps overcompensating" (Furth, 2002, p. 84).

When observing a self figure drawing one must take notice of the stage of artistic development that is presented in the drawing.

In her book "Breaking the silence" Malchiodi (1997) explains the stages of artistic development as follows: Stage 1: scribbling styles, children at 18 months to 3 years of age begin to make their first marks on the paper. There is little control of the motion that is used for scribbling. Stage 2: basic forms, children from 3 to 4 years old continue to scribble but, also begin to be more involved in naming and inventing stories about those scribbles. Stage 3: human form and beginning schema, children between the ages of 4 to 6, start to draw human like figures. Stage 4: development of a

visual schema, from the ages of 6 to 9, children begin to develop visual symbols or schema for human figures, animals, houses, trees, and other objects in the environment. Stage 5: realism, by the age 9 or 10 children become very interested in depicting realistic elements and they begin to attempt perspective. Stage 6: adolescence, children over the age of 13 that continue to make art will be able to reach this stage, but many adults do not get to this stage. This stage includes great detail, attention to color, design, and are able to create abstract images.

The stages of artistic development are expected to correlate with the drawers' age. This study hypostasize is that there would be a lack of correlation in our ASD cohort between the stage of artistic development and their age. The literature offers explanation such as the Lim & Slaughter's work (2008) which found that children diagnosed with AS had a selective deficit in generating representation of human figures. They suggest that this might result from their lack of interest in the social world. Lee at el. (2007) found that there were differences between the human figures drawn by typically developing children and those with ASD. Children with ASD produced human figures that were less sophisticated than those typically developing children. And Emery (2004) explained that: "Autistic children do not develop imaginary schema, and they show little interest in drawing or even doing a scribble. This is considered abnormal, and yet the world of autism has no apparent inner order for relating to objects or for developing such schema."

This research intended to compare between two adults cohorts, one diagnosed with ASD and one without diagnoses of developmental disorders (control). The hypothesize is that there would be differences in the human figure drawings between the individuals with ASD and those without. Another hypothesize is that autistic individuals would draw larger human figure and be limited to earlier stages of artistic development.

Method

Participants:

This study included two adults cohort: one included 8 individuals between the ages of 22 to 38 (M = 27.6 , SD = 4.96) that were diagnosed as autistic; and a control cohort of 8 young adults typically developed, between the ages of 22 to 38 (M = 28, SD = 6.19). All the ASD diagnosed subjects live in a hostel for autistic adults. The control cohort was randomly selected.

Instruments

The DAP Test by Machover as it appears in Rimmerman's book (1975, page 87-93) was used to compare the drawings.

Procedure

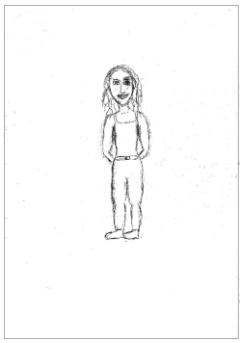
The autistic subjects were met at the hostel where they live; during their weekly art therapy class. Before the study we got permission from the parents and the social worker at the hostel to conduct our research. The controlled cohort, randomly assigned, also agreed to participate in the study. The subjects were asked "to draw themselves" offering them pencils and standard A4 paper. When a subject drew more than one drawing, the first drawing was selected and scored. The drawings were scored by three judges. The reliability between judges was tested using KAPPA test and the reliability score was 0.756.

Based on the literature, it was decided to focus on two indicators: difference in size of the human figure and stage of artistic development. The square area of the human figures was calculated and compared using the T test for independent sample. The T test was also used to compare the average stage of artistic development in each cohort.

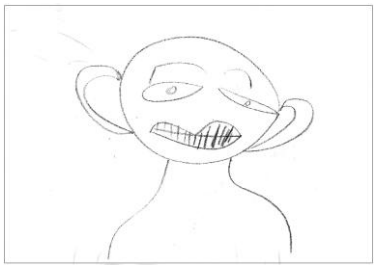
Results

In the present study differences were found between the drawings of the two cohorts. The first indicator to be examined was the size of the human figure. Significant differences were found between the two cohorts in the square area of the human figure [$t(14) = 6.72$, $p < 0.0001$], While the average human figure size was found to be 306.88 ± square centimeter 66.26 (Mean ± SD) in the ASD cohort, that of the control cohort was only 124.90 ± square centimeter 38.42(Mean ± SD) (See Figure 1).

Figure 1- Size of human figure - ASD cohort vs. control cohort:



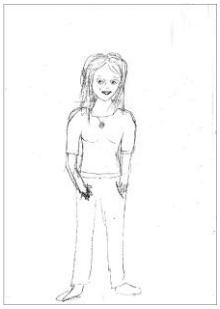
Female, Age: 20, **Control cohort** Square area of the human figure (cm) : **80**



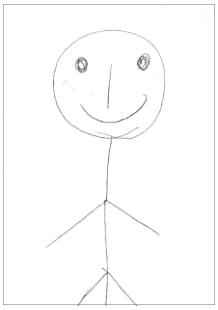
Female, Age: 22, **ASD cohort**. Square area of the human figure (cm) : **342**

The second indicator that was examined is the stage of artistic development. While the drawings of the ASD group were scored between the second stage and the fifth stage, the drawings of the control cohort were scored between the fourth stage and the sixth stage. There were significant differences between the two cohorts [$t(14)= -4.99$, $p < 0.0001$], while the average stage of the ASD cohort was found to be 3.25 ± 0.89 (Mean ± SD) , that of the control cohort was 5.25 ± 0.70. (See Figure 2)

Figure 2- Stage of artistic development - ASD cohort vs. control cohort:



Female, Age: 37, **Control cohort** Stage of artistic development: **6**



Male, Age: 25, **ASD cohort** Stage of artistic development: **3**

Discussion

The aim of this study was to investigate whether there will be differences between ASD and control subjects when applying DAP test. As expected, this study showed that there were differences in both parameters; size of the human figure drawing and stage of artistic development between the ASD group and the control group. The results indicate that the ASD individuals' drawings had larger figures than those of the control subjects. The article inferred that this can be explained by their lack of interest in the social world (Lim et al. 2008), and being absorbed in their own world (Koenig et al. 2011).

The results also indicated that the ASD individuals were scored in a lower stage of artistic development compared to the control group. Since children with ASD have problems developing imaginary schema and they also show little interest in drawing (Emery, 2004), this may explain their less sophisticated drawings.

The indicators used in the study were found to be significant and they can be used as a base for creating a diagnostic test for ASD. While a number of studies have investigated ASD in children and their drawing abilities, research on this topic regarding ASD adults is lacking in the literature therefore, the recommendation is that further research should be performed.

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APPENDIX – Data

Participant No.	Square area of the human figure (cm)	Stage of artistic development (1-6)		
		judge 1	Judge2	Judge3
1	350	3	2	3
2	190.3	4	4	4
3	340	3	3	3
4	314.5	2	3	3
5	342	4	3	3
6	386.4	2	2	2
7	306	3	3	3
8	225.8	5	5	5
9	101.8	5	5	5
10	146.3	5	5	5
11	80	6	6	5
12	136.5	5	5	5
13	74.8	4	4	4
14	136.5	6	6	6
15	192	6	6	6
16	131.3	5	5	5

Participants 1-8 = ASD

Participants 9-16 = Control Group

Corresponding author: Merav Gabriely Adler

Email :adlermerav@gmail.co