Z9y"I" and "They": Is the inability of children with ASD (Autism Spectrum Disorder) to distinct themselves from others apparent to their human figure drawings compared to their TD (Typical Developing) peers?

Sarris Dimitrios[1], Riga Pinelopi[2], Zaragkas K. Charilaos[3], Papadimitropoulou Panagoula[4]

ABSTRACT

One of the predominant features of children belonging to the autistic spectrum disorder is their inability to distinct themselves from others. There is, also, evidence that drawings of human forms by children with autism tend to lack variety, possibly because they reflect the unusual way these children think about and relate to other people. Based on the above references we hypothesized children's drawings of human figures apart from their general intellectual and artistic abilities reveal things about their awareness and conception of themselves and others. The aim of the current study is to investigate if the inability of autistic children to distinct themselves from others appears in their human drawings too as a consequence of their limit social and communicative experience. For this purpose, 12 children were recruited, 6 with ASD and 6 typically developing matched on gender and chronological and verbal mental age. Both groups were asked to produce three human figures (one to represent their father, one for their mother and a third one to represent themselves). Then, they requested to draw a house, a house of a relative or a close to them person (grandparents, friends etc.) and at last their own house. The human and house drawings were scored using standardized procedures (McCarthy's Scale, 1972 and

[1] Assistant Professor of Special Education, Director of Laboratory Hall of Special and Therapeutic Education, Department of Early Childhood Education (E.C.E.D.U.),University of Ioannina, Northwest Greece, Greece
Email:sarrisdem@gmail.com

[2] Research Assistant, Laboratory Hall of Special and Therapeutic Education, Department of Early Childhood Education (E.C.E.D.U.), University of Ioannina, Northwest Greece, Greece
Email:pineriga@gmail.com

[3] Assistant Professor, Department of Early Childhood Education (E.C.E.D.U.),University of Ioannina, Northwest Greece, Greece
Email:hzaragas@gmail.com

[4] Research Assistant, Master of Education, University of Rouen, France
Email:yioulipapad@gmail.com

Lee and Hobson's Scale, 2006) for assessing accuracy, detail and complexity. The results revealed that the human figure drawing scores of children with ASD were slightly lower than those of the typically developing children but there were no significant score differences within the drawing scores of autistic group. As it was expected, there were no score differences within the autistic group regarding the drawings of the two genders, which is not apply in case of their TD peers. What is worth mentioning is that lack of distinction was not restricted exclusively in case of human figures but also on house drawings of autistic children as the score contrast was not high enough. This last result may be affected by the small number of the sample, therefore it is doubtful and cannot be generalized.

Keywords: Autism Spectrum Disorder, High Functioning Autism, the Self and the Others, Human and House Drawings

"Moi" et "Eux ": L'incapacité des enfants atteints du trouble du spectre de l' autisme à se distinguer des autres par rapport à leurs dessins de figure humaine en les comparant avec ceux de leurs pairs au développement typique

RÉSUMÉ

Une des caractéristiques prédominantes des enfants appartenant au spectre autistique est leur incapacité à se distinguer des autres. Il y a aussi des preuves que les dessins de formes humaines faits par les enfants autistes ont tendance à manquer de variété, peut-être parce qu'ils reflètent la façon inhabituelle avec laquelle ces enfants pensent et se rapportent aux autres gens. Sur la base de cette observation, nous avons émis l'hypothèse les dessins d'enfants, au-delà de leurs capacités intellectuelles et artistiques générales, révèlent des caractéristiques sur leur conscience et leur conception d'eux-mêmes et des autres. Le but de la présente étude est d'enquêter si l'incapacité des enfants autistes à se distinguer des autres apparaît dans leurs dessins d'humains, en dépendant aussi de leur capacité sociale et de leur expérience communicative. A cet effet, 12 enfants ont été recrutés, 6 avec ASD et 6 avec un développement typique, appariés par sexe, niveau mental et âge. Les deux groupes ont été invités à produire trois figures humaines (une pour représenter leur père, une pour leur mère et une troisième pour se représenter eux-mêmes). Puis on a demandé de dessiner une maison, la maison d'un parent ou d'un proche (grands-parents, amis, etc.) et enfin leur propre

maison. Les dessins de l'humain et de la maison ont été notés en utilisant des procédures normalisées (McCarthy's Scale, 1972 et Lee et Hobson's Scale, 2006) pour évaluer l'exactitude, le détail et la complexité. Les résultats ont révélé que les figures humaines dessinées par des dizaines d'enfants atteints de TSA étaient légèrement inférieures, selon l'évaluation faite, à celles des enfants en développement, mais qu'il n'y avait pas de différences significatives dans les scores des dessins du groupe autiste. Comme on s'y attendait, il n'y avait pas de différences de score au sein du groupe autiste concernant les dessins des deux sexes, différemment du cas de leurs pairs TD.

Il est à mentionner que le manque de distinction des résultats n'était pas limité aux figures humaines mais concernait aussi les dessins de maison d'enfants autistes bien que le score n'était que légèrement différent. Ce dernier résultat peut être affecté par le petit nombre des sujets de l'échantillon, et par conséquent, il est douteux et ne peut pas être généralisé.

Mots-clés: Trouble du spectre de l'autisme, autisme de haut niveau, soi et les autres, dessins de maisons et des humains.

INTRODUCTION

Self-awareness is an important component of self- system playing a decisive role in the construction of one's *self-image*. The term *self-awareness* refers to "being aware of self as the object of one's own attention, including one's own mental state (e.g., perceptions, sensations, attitudes, intentions, emotions), public self-aspects (e.g., behaviors) and general physical appearance" (Morin, 2004, p. 198; Huang, Hughes, Sutton, Lawrence, Chen, Ji, & Zeleke, 2017). As an alternative way used by Psychologist to refer to what a person is thinking and feeling about themselves and others is the "theory of mind". "Theory of mind" refers to being able to infer the full range of mental states (beliefs, desires, intentions, imagination, emotions, etc.) that cause action (Baron-Cohen, 2001, p.169; Harris, 2018). Most modern theories focus on aspects of the "self". For example, Gillihan and Farah (2005) suggested a

particularly useful distinction of the "self" between *physical* and *psychological* aspects of the self. "Physical aspects of the self are typically examined in studies of self-face recognition, agency, and perspective taking, whereas psychological aspects of the self tend to be operationalized with studies examining autobiographical memory and self-knowledge in the form of personality traits" (Uddin, 2011, p. 203). Theory of mind, as well as Self-awareness, has been studied in both normal and abnormal development, including individuals with Autism Spectrum Disorders (ASD) (Huang et al., 2017; Baron-Cohen, Wheelwright, Hill, Raste and Plumb, 2001).

In case of autism, the existing literature suggests that there are difficulties in understanding that other people have distinct plans, intentions, thoughts, feelings, and different point of view from their own (Harris, 2018). Therefore autistic people are not able to receive themselves as distinct human beings from others (Baron Cohen & Bolton, 1993) with respect to the psychological and not to the physical aspect of self-representation (Uddin, 2011).

As it is known, Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social interactions and communication, as well as the presence of stereotyped behaviors and restricted interests (American Psychiatric Association, 2013). The origin of the term "autism" came from the Greek "autos", which means "self, same, spontaneous; directed from within" (Elmose, 2016; Uddin, 2011). This disorder, which includes the types of Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), was first described in a systematic way in 1943 by Leo Kanner, a child psychiatrist, best known for his classic paper: "Autistic Disturbance of Affective Contact". Kanner, (1943) provided detailed case histories of 11 children with 'autistic disturbance of affective contact'. Based on his observations assumed that they have come into the world with the innate inability to form the usual, biologically provided contact with people, just as other children come into the world with innate physical or intellectual handicaps. As he pointed out, people with the disorder can seem highly self-absorbed, lost in their own world. Their conversations with others tend to be one- sided, focused entirely on topics that interest them. In addition, subsequent research from various sources including clinical descriptions, autobiographies, self-reports, and parent reports lead him to address differences in understanding the self in his original cases. He suggested that differences in self-awareness might be linked to the

difficulties individuals with ASD experience daily. Due to the heterogeneous nature of this disorder, self-awareness can be a unique experience for each person who characterized by the symptoms of the spectrum (Elmose, 2016).

Among the main features that he observed in these children included lack of communicative skills, preservation of sameness and lack of awareness of themselves and others (Harris, 2018; Wang, DiNicola, Heymann, Hampson and Chawarska, 2018). Also, attention, use of communicative language and social skills are common challenges faced by individuals with ASD, which can lead to difficulties in social relationships and relating to peers. Moreover, individuals with ASD have difficulty in understanding emotional states and considering plausible causal factors, initiating and maintaining conversational exchanges, understanding the interests and previous knowledge of others, which may cause misconceptions about others (Rubin and Lennon, 2004; Huang et al., 2017).

Considering the traits that autistic people reveal, some examples of self-awareness experiences in individuals with ASD include the following:

- They do not know what they do not know, so it is hard for them to judge when and how to know more.
- They have difficulty telling the differences between their own or others' preferences and emotions in social situations.
- They have difficulty relating their own behaviors to environmental and social contexts/situations, and to others' actions.
- They have difficulty understanding self and others' thoughts and feelings.

THE HUMAN FIGURE DRAWING IN CHILDREN WITH AUTISTIC SPECTRUM DISORDER

One of the first design productions emerged in young children's drawings is the human figure (Cox & Howarth, 1989). Representational drawing emerges at about the age of 2 years when children give an identity to their scribbles either before or after they have produced them. According to Luquet (1913, 1927), a significant change becoming in children's drawings during early childhood is the transition from intellectual to visual realism. Children, who are younger than 7 years seem to be

strongly influenced by their previous knowledge on their depictions, therefore tend to provide a mixture of viewpoints or to include features that are hidden from their sight. Such intellectual realism reflects children's attempts to express their concepts or internal models, through their drawing. Luquet claimed that as children become older, their influence of conceptual knowledge on their drawings diminishes and eventually pass to the stage of visual realism. This following stage is characterized by relatively close to life representations of visual scenes from the artist's perspective (Ford & Rees, 2008).

The past few years, some researchers have asked whether children with autism show the same transition from intellectual to visual realism as children without autism and, if so, whether the transition occurs at a similar mental age. This question is of interest given the impairments autistic children face in the domains of socialization, communication and imagination (Wing & Gould, 1979; Ford & Rees, 2008).

Although there is some evidence that children's ability to draw is positively correlated with their level of general intelligence (Harris, 1963; Koppitz, 1968) the correlation coefficients themselves are by no means perfect, indicating that many highly intelligent children do not draw well and, conversely, that many children of rather low intelligence draw surprisingly well (Eames & Cox, 1994).

Before referring to the existing literature on drawings by children with autism, it is appropriate first to briefly refer to the factors that affect the drawings of typical developing children. As Freeman argues, children in order to produce representational drawings should coordinate several distinct skills. In particular, the child has to:

a) Form a mental description of the object to be represented
b) Use that description as a guidance for its graphic design and
c) Choose among a list of types of marks, and from a battery of drawing-devices, those that are more informative "(Freeman, 1987, p. 149).

Having difficulties at any of these stages is likely to lead to difficulties in drawing. For instance, in case of human figure drawings, children may have difficulty in accessing a mental model which then leads them to face challenges in planning the execution of the drawings (Cox, 1992, Freeman, 1987).

In addition to the cognitive development of children, human drawings reflect their attitude towards themselves and important others in their lives (Koppitz, 1968). If autism syndrome represents an abnormality in per se, as some authors (e.g. Kanner, 1943; Hobson, 1993) supported, then children's drawings may light the influence of social engagement on depictions of human forms.

As regards the human drawings of children with developmental abnormalities, reviewing the current literature, it is evident that they have been used in different ways as a tool to estimate various aspects of their psychological status e.g. their intellectual maturity, personality, thoughts and emotions (Goodenough 1926; Koppitz 1968; Lim & Slaughter, 2008). Especially, in case of children who characterized by cognitive or intellectual abnormalities, such as individuals with autism who typically have a cognitive profile characterized by poor verbal ability but relatively good non- verbal ability (Cox, M. & Eames, K., 1999), drawings play a core role as a non verbal tool to which the majority of young people can respond to a satisfy degree. Although there is a lot of controversy about their reliability and validity as clinical assessment tool, their value as a measure of intellectual maturity is without doubt accepted. Therefore, there are numerous of standardized systems for scoring children’s drawings, the majority of which focus on human figure drawings (Lim & Slaughter, 2008).

Many researchers conclude that drawings of the human figure reflect developmental stages that are likely to be associated with both cognitive processes and social influences. In case of children with developmental disorders, human figure drawings typically reveal delays that are highly connected with intellectual impairments (Lim & Slaughter, 2008).

However, most of the studies that used human figure drawings as a research tool focused mainly on studying emotion recognition (McPartland, Dawson, Webb, Panagiotides and Carver, 2004), rather than recognition of facial identity, in individuals with ASD (Uddin, 2011). Thus, there have been only few studies examining brain responses to the self and significant others in autism, making it difficult to determine the exact extent to which this form of self-representation is altered in the disorder and whether or not it is related to other familiar faces processing (Uddin, 2011).

Considering the few studies that address this aspect of human figure drawings, it is suggested that children with autism would possess less mature representations of people in their drawings compared to typically developing children (Lewis & Boucher,1991) and that human figure drawings of the children with autism were significantly less distinctive, varied little from one to the other than the human figure drawings of children without autism (Lee and Hobson, 2006; Lim & Slaughter, 2008).

In the present study, to the best of our knowledge, our interest is focusing on examining human figure drawings of a group of children that have been diagnosed with autism (High Functioning Autism) in comparison to their typically developing peers. This research intended to seek how those ASD characteristics, mentioned in the literature, are reflected in the self human figure drawings. More specifically, through this survey we expect to investigate a) if their inability to distinct themselves from others appears in their drawings and b) if this inability is associated with difficulty in perceiving and the two genders (male/ female) and c) if it is associated only with human forms and not with non animate objects.

METHODOLOGY

Objectives of the study:

The objectives examined in the current study were a) if the group with autistic children would use less distinctive features to their human figure drawings in order to represent themselves in contrast to significant others than the group of TD children and b) if the autistic children are able to distinct their gender from the opposite one in their drawings by using representative features for each of the two genders comparing to their typical developing peers. Lastly, we examined c) if the ability or inability of both groups to depict distinctive human figures is generalized in other non human drawing cases, such as in depicting “objects” (e.g. house) from the real life. In this study we asked both groups to draw houses as a non human drawing, because according to the literature houses are among the first representational figures drawn by children spontaneously, of the most familiar “objects” of their everyday life and are vary in style (Eng, 1970; Lark Horowitz, Lewis, & Lucia, 1967).

Hypotheses:

Based on the purposes of our research, we passed on the formulation of the following hypotheses:

1. Our first hypothesis was that children with autistic disorder will draw less distinctive human figures in comparison to their peers.
2. A second hypothesis was that autistic group will not be able to draw representative (distinct) human figures for male and female respectively.
3. Our last hypothesis was that lack of distinctiveness would be noticed exclusively in case of autistic children and only in human forms rather than in house drawings.

Participants:

In the present study took part 12 primary school age children with (N= 3 boys, 3 girls) and without (N= 3 boys, 3 girls) Autism Spectrum Disorder (ASD) who were recruited from a Special Needs Secondary School and a General Secondary School from urban district of Northwest Greece (Epirus). The total sample divided into two groups of 6 children each, based on the criteria of having being diagnosed with or without ASD, their *gender* and their *chronological* (CA) and *mental age* (MA). The mean chronological age of children with Autism Spectrum Disorder was 9.6 years (range = 8.2-12.5 years) while the non-verbal MA was 8.3. The mean chronological age of typically developing children was 9.8 years (range = 8 – 12.6 years), while the mean non-verbal MA was 14.3. Moreover, it was taken into account the *drawing ability* of the selected sample as well as the *functioning degree* of autistic children. In particular, it was included children with *high-functioning autism* (*HFA*: IQ above 70). Hence, those with more severe types of autism (mild/profound autism spectrum disorder and pervasive developmental disorder) were excluded. It has to be mentioned that with term "*high-functioning autism"*, we referred to less severe types of autism in which the autistic person often characterized by normal intelligence and ability of self-serving but at the same time they are facing communication difficulties due to their poor social skills (Andersen, Hovik, Skogli, & Øie, 2017).

Tools:

For the drawing tasks children were provided with a few pencils, a pencil sharpener, an eraser and six pieces of paper (size A4).

Procedure:

The survey was carried out in three phases. At first place, we asked participants to draw their mother (a female human figure), then their father (a male human figure) and lastly themselves subsequently, using as many typical details as they could. In second place, we asked them to draw a house, then we asked them to draw another house of some close to them person (e.g. best friend, grandparents, neighbors). Lastly, they were asked to draw their own house. Each participant was supplied with A4 size papers, a pencil, a pencil sharpener and an eraser.

In the last phase, in order to test their abilities in planning and executing drawings we administered the Draw-a-Design subtest of the McCarthy Scales of Children's Abilities (McCarthy, 1972). In this case, a nine-page booklet was given to the participants, each page of which was divided into two equal sections. For the first three items, the researcher drew a standard geometric design on the first section of the page and the participant was asked to copy the same figure on the second section. The remaining six increasingly complex geometric designs were pre-drawn in the first section of the page and the participants were asked to copy each of them on the second ones.

The whole process took place in a school classroom with one participant each time. There was no time limit. For each participant the requested time for the drawings and the "Draw-a-Design" subtest of the McCarthy Scales of Children's Abilities was approximately 20-35 minutes.

Coding of drawings:

- *Human figure drawings*

The three human figure drawings were coded using McCarthy's standardized scoring procedures (McCarthy, 1972). This involves attributing a score from 0 (feature not present) to 2 (good depiction of the feature) according to strict criteria. The 10 features to be coded were "*head, hair, eyes, nose, mouth, neck, trunk, arms and hands, attachment of arms, legs and feet"*. The maximum score for a human figure drawing was 20. We also examined the drawings for any evidence of unusual features not included in the standard approach to scoring.

For assessing gender differentiation among the human figure drawings, we compare (a) the female and male human figures, and (b) the self and same-sex human figures, according to 12 components of the human figures: the 10 features of the drawing defined by McCarthy and the two additional features: *size of figure* and *clothing*. A score of 1 was assigned if there was a clear difference between the figures in the way each feature was drawn. However, if the difference between the features was based only on size and the graphical structure was the same, the score would be 0 for the specified feature. Therefore, for each set of comparisons, the maximum total contrast score was 12.

- *House drawings*

In case of house drawings, the houses were scored according to a scale designed by Lee and Hobson (2006), containing 10 features (boundary e.g. outline of floor/ two walls/ ceiling, 3 dimensional representation, roof attachment of chimney/ aerial to the roof, window: square/rectangle, window panes/curtains in at least one window, windows shows symmetry and in proportion to house, door, door furniture, doors shows symmetry and in proportion to house). The scoring process was similar to that of the human figure (from 0 score "non depicted feature" to 2 "good depiction of the feature"), thus the total max score was 20.

The comparisons made in case of house drawings involved ratings firstly between the drawing of the first house and their own house and secondly between the drawing of the house of their close to them person with the first house. The scores were given according to the numbers of features that differentiated the figures. As in case of human drawings, two more features were estimated (size and features such as flowers or a fence around the house), thus the maximum score was 12. In this way, the scores of house drawings could be compared with the scores of the human figure drawings.

- *Draw-a-Design subtest*

The Draw-a-Design subtest was scored using McCarthy's criteria (McCarthy, 1972). The maximum score was 19. Firstly, one of the researchers rated all the human figure drawings, and these ratings were employed throughout the analyses. Then, a second researcher who was not informed about the diagnoses of the participants and the hypothesis underlying the study, scored all the drawings of three participants in each group (the half percent of the total sample) in order to check the reliability of ratings. The kappa (k) coefficients for the raters' scoring of drawings were all above .88, which indicates according to Landis and Koch (1977) 'almost perfect agreement'. Finally, a last rater who also ignored the diagnoses and research hypotheses, scored all 12 participants' scores between pairs of human figures (male / female & self / same sex) and between pairs of houses (own house / first house & relatives' house / first house). In this case, the kappa coefficients for the raters' scoring of contrasts were all above .78, indicating 'substantial agreement'.

RESULTS AND CONCLUSIONS

As can be seen in Figures 1 and 2, both groups (children with and without autism) were succeeded in producing human as well as house drawings. Most of them used many of the human and house features scoring at least 1 out of 2 (maximum score) to each of the 10 features of the human and the house drawing that are assessed in McCarthy's (1972) and Lee & Hobson's (2006) standardized scoring procedures, respectively.

As it is evident from the results, there were no significant group differences regarding the number and type of features children with and without autism included in their human and house drawings but their performance on the "Draw-a-Design" (see Table 3) presents a significant group difference (*Aut. Group: M=12.8, SD= 4.6 vs. TD Group: M= 16.2, SD= 2.7*), which though did not being an indication of group contrast in conceptualizing and drawing the human physical form. Also, it is worth mentioned that there were no remarkable unusual features at the autistic children's human and house drawings that were not included in the standard approaches.

The means of the total scores on each of the tasks for both groups are presented in Tables 1, 2 and 3 respectively, whereas the scores of the two groups on each of the tasks are presented in tables 4 and 5.

First hypothesis: children with autistic disorder will draw less distinctive human figures in comparison to their peers

As regards the first hypothesis, according to the measures (Table 1 & 2), it is evident that in case of autistic children there is lack of difference among the three human figures as the mean scores of the human features were used in each case were close to one another (M= 15.3 for "self", M= 14.8 for "Father", M=15.3 for "Mother"). On the contrary, the three human figures of typical developing children present slight differences on their total mean scores (M= 17.3 "self", M= 16 for "Father", M=18.5 for "Mother"). These results agree with our first hypothesis that "autistic children will draw less distinctive human figures in comparison to their peers"**,** even though the differences noted in the second case were not big enough.

Second hypothesis: autistic group will not be able to draw representative (distinct) human figures for male and female respectively

As regards the second hypothesis, according to the measures of the first comparison (see fig. 3 & fig.4) between male and female human figures, there were emerged slight group differences. More specifically, as can be seen in Table 1, the majority of the children with autism drew male and female figures that were closely similar to one another (Mean= 14.8, SD= 0.75 for male figure vs. Mean=15.3, SD= 0.51 for female

figure) in contrast to the group of TD children whose human forms of the two genders were distinct regarding the points they scored (Mean= 16, SD= 1.3 for male figure vs. Mean=18.5, SD= 1.37 for female figure), according to McCarthy's standardized scoring procedure. In addition, as it is obvious from the second comparison between "self" and "same gender" human figure (see Figure 4), there were no significant difference in both groups (*self*: Mean= 15.3, SD= 0.81 and *same gender*: Mean=15.1, SD= 0.75 for autistic children vs. *self*: Mean= 17.3, SD= 1.3 and *same gender*: Mean=17.2, SD= 1.94 for typical developing children). From the above, we conclude that both groups did not differentiate the human drawing of themselves from the human figure of the same gender (mother or father human form), but in case of male and female human figures, children with autism showed an inability to distinct the two genders, whereas children with TD seem to recognize themselves as a "male" or "female" respectively.

Third hypothesis: Lack of distinctiveness would be observed exclusively in case of human figure drawings of the group with autism and not in drawings of houses

In case of house drawings, the results revealed there were significant group differences between the HFA and TD children. In particular, the total mean performance of TD children in house drawings was higher (M=16.4, SD= 0.67) than that of HFA children (13.1, SD= 0.92). According to the comparisons within the two groups there were also score differences. More specifically, the measures of the first comparison (see fig.5 & Table 2) between the drawing of the first house and participant's own house revealed that the majority of the children with autism drew house drawings that were slight different to one another (Mean= 13, SD= 0.63 for "house 1" vs. Mean=14.1, SD= 0.75 for "own house") just like in case of TD children (Mean= 15.8, SD= 1.60 for "house 1" vs. Mean=17.1, SD= 1.16 for "own house"). The same results emerged in the second comparison (see Figure 6 & Table 2) too, between the drawing of the house of their close to them person with the first house (*relative's house*: Mean= 12.3, SD= 0.81 and *first house*: Mean= 13, SD= 0.63 for autistic children vs. *relative's house*: Mean= 16.3, SD= 1.03 and *first house*: Mean=15.8, SD= 1.6 for typical developing children).

Lastly, as regards the last hypothesis of the study, we compared the two groups on the scores between the self and the same-sex figure drawings and with the scores between the drawings of the participant's house and the first-drawn house (see Figures 7). The results revealed that although there is a lack of differences within the HFA group in case of drawings between the self and the same-sex human figure, there was a slight higher contrast between the scores of the first house and their own house drawings. On the other hand, within the group of TD children, the compared house drawings were more distinctive, just like in case of their human figure drawings (self figure and the same-sex human figure). It is also worth mentioning that both group performances are higher in the human forms rather than in house drawings. These evidences partly confirm our third hypothesis, as the score contrast in case of house drawings was not high enough. However, our assumption is that may the limit number of our sample affects significantly the results in this last case.

DISCUSSION

In previous studies, there was illustrated that autistic children's sense of individual kinds and characters of people and their concepts of themselves are less infused with personal qualities than are those of people without autism, and their awareness of contrasts between themselves and others is diminished in extent and limited in depth (Lee & Hobson, 1998).

In the present study the results reveal some similarities as well as some differences in the drawings of children with and without autism. On one hand, the abilities of participants with autism compared favorably with verbal mental age (MA), as in all of their drawing tasks they used almost the same number and type of features with the TD group, to depict detailed human and house drawings respectively. This evidence is important to our knowledge for understanding what is and what is not usual in autistic drawings, given at least the current results. These findings are in agreement with previous studies of drawing abilities in children with autism (e.g. Eames & Cox, 1994; Lewis & Boucher, 1991).

On the other hand, in case of human figure drawings, there was noticed a group difference. More specifically, participants with autism showed less distinctiveness in

their drawings of different humans than in their drawings of different houses, whereas this was not observed in case of participants with TD. Also, the group of autistic children showed less differentiation a) in drawing males and females and b) in drawing themselves vs. the same-gender figure, than did children with TD. Previous studies (Leevers & Harris, 1998) explained this drawing strategy arguing that children with autism might develop a rough plan for the drawing of familiar pictures which they apply repeatedly than expend the effort to generate a new plan. Whereas, some others might suggest the lack of differentiation among the human figure drawings of children with autism could be expected on the basis of a domain-general impairment in generative ability (Lewis & Boucher, 1991). Also, the fact that children with autism spectrum disorder used to spend less time looking at people may account for this selective deficit in their human figure drawings (Swettenham, Baron-Cohen, Charman, Cox, Baird, & Drew, 1998), resulted in making less representative human forms (Lewis and Boucher, 1991). Additionally, compared to typically developing children, those with ASD may be less motivated to generate accurate and detailed drawings when given the instruction to draw a person given the fact that are more interested in inanimate objects. This factor may lead them to put little effort in producing a human figure drawing.

Although there has been well-justified emphasis on the significance of non-social experiences and abilities in determining the forms of children's human figure drawings (Cox, 1993; Freeman, 1980), there remains the challenge of analysing the impact of social factors. If the uniqueness of autism is to be found in the children's atypical qualities of personal relatedness (Hobson, 2002; Kanner, 1943), including the way their conceptions of self and other are impoverished by a relative failure to incorporate attitudes towards people or others' attitudes towards themselves (Hobson, 1990; Lee & Hobson, 1998), then their relative lack of distinctiveness among human figure drawings may point to the importance of personal relatedness in grounding children's increasingly differentiated drawings of themselves and other people.

Whatever the case in these respects, the present findings of group differences in performance across tasks reflect a significant and specific contrast in the ways children with and without autism draw human figures. These differences promise to shed light on the factors that influence how children who do not have autism draw such figures, and may indicate how interpersonal engagement and identification serve

to enrich and elaborate a child’s awareness of and attitudes towards different kinds of other person and the child’s own self.

REFERENCES

American Psychiatric Association, (2000). Diagnostic and Statistical Manual of Mental Disorders: DSM-IV-TR. Washington, DC: American Psychiatric Association.

Andersen P. N., Hovik, K. T., Skogli, E.W., & Øie, M. G. (2017). Severity of Autism Symptoms and Degree of Attentional Difficulties Predicts Emotional and Behavioral Problems in Children with High-Functioning Autism; a Two-Year Follow-up Study. *Frontiers in Psychology*, 8, 1-9.

Baron - Cohen, S., & Bolton, P. (1993). *Autism: The Facts*. Oxford: Oxford University Press.

Baron - Cohen, S., Wheelwright, S., Hill, J., Raste, Y. and Plumb, I. (2001). The "Reading the Mind in the Eye" Test revised version: A study with normal adults, and adults with Asperger syndrome or high functioning autism. *42* (2), 241-251.

Cox, V. M., & Howarth, C. (1989). The human figure drawings of normal children and those with severe learning, difficulties. *British Journal of Developmental Psychology*. 7, 333-339.

Cox, M., & Eames, K. (1999). Contrasting Styles of Drawing in Gifted Individuals with Autism *Autism*, 3, 397-409. http://dx.doi.org/10.1177/1362361399003004006.

Eames, K., & Cox, V. M. (1994). Visual realism in the drawings of autistic, Down's syndrome and normal children. *British Journal of Developmental Psychology*. 12, 235-239.

Elmose, M. (2016). A conceptual framework for understanding characteristics of self-awareness associated with autism spectrum disorder. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology. 4*(3):109-114.

Eng, H. (1970). *The psychology of children's drawings: From the first stroke to the coloured drawing*. London: Routledge.

Ford, M. R., & Rees, L.E. (2008). Representational drawing and the transition from intellectual to visual realism in children with autism. *British Journal of Developmental Psychology*, 26, 197–219.

Freeman, N. (1987). Current problems in the development of representational picture production. *Archives de Psychologie*, 55, 127–152.

Gillihan, S. J., & Farah, M. J. (2005). Is self special? A critical review of evidence from experimental psychology and cognitive neuroscience. *Psychology Bulletin, 131*(1), 76–97.

Goodenough, F. L. (1926). *The measurement of intelligence by drawings*. New York: World Books.

Harris, D. B. (1963). *Children's drawings as measures of intellectual maturity: A revision and extension of the Goodenough Draw-a- Man test*. New York: Harcourt, Brace and World.

Harris, J. (2018). Leo Kanner and autism: a 75-year perspective. *International Review of Psychiatry. 30* (1), 3-17.

Hobson, R. P. (1993). *Autism and the Development of Mind*. Hillsdale, NJ: Erlbaum.

Huang, X. A., Hughes, L. T., Sutton, R. L., Lawrence, M., Chen, X., Ji, Z., & Zeleke, W. (2017). Understanding the Self in Individuals with Autism Spectrum Disorders (ASD): A Review of Literature. *Frontiers in Psychology*. 8, 1-8.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*: *Journal of Psychopathology, Psychotherapy, Mental Hygiene, and Guidance of the Child.* 2, 217–250.

Koppitz, E. M. (1968). *Psychological evaluation of children's human figure drawings*. London: Grune & Stratton.

Lee, A., & Hobson, R. P. (2006). Drawing self and others: How do children with autism differ from those with learning difficulties? *British Journal of Developmental Psychology*. 24, 547–565.

Leevers, H. J., & Harris, P. L. (1998). Drawing impossible entities: A measure of the imagination in children with autism, children with learning difficulties, and normal 4-year-olds. *Journal of Child Psychology and Psychiatry*, 39, 399– 410.

Lewis, V., & Bouchet, J. (1991). Skill, content and generative strategies in autistic children's drawings. *British Journal of developmental Psychology*. *9* (3), 393-416.

Lim, K. H., & Slaughter, V. (2008). Brief Report: Human Figure Drawings by Children with Asperger's Syndrome. *Journal of Autism and Developmental Disorders.* 38, 988–994.

Luquet, G. H. (1913). *Les dessins d' un enfant*. Paris: Alcan.

Luquet, G. H. (1927). Le realisme intellectuel dans l'art primitif. 1. Figuration de l' invisible. *Journal de Psychologie*, 24, 765-797.

McCarthy, D. (1972). *McCarthy Scales of Children's Abilities*. New York: Psychological Corporation.

McPartland J., Dawson, G., Webb, S. J., Panagiotides, H., and Carver, L. J. (2004). Event-related brain potentials reveal anomalies in temporal processing of faces in autism spectrum disorder. *Journal of Child Psychology and Psychiatry*, *4*(7), 1235 - 1245.

Morin, A. (2004). A neurocognitive and socioecological model of self-awareness. Genet. Soc. Gen. Psychol. Monogr. 130, 197-222. doi:10.3200/MONO.130.3.197-224.

Rubin, E., & Lennon, L. (2004). Challenges in social communication in Asperger syndrome and high-functioning autism. *Topics in Language Disord*ers. 24. 271–285. doi: 10.1097/00011363-200410000-00005.

Swettenham, J., Baron-Cohen, S., Charman, T., Cox, A., Baird, G., & Drew, A. (1998). The frequency and distribution of spontaneous attention shifts between social and nonsocial stimuli in autistic, typically developing, and non autistic developmentally delayed infants. *Journal of Child Psychology and Psychiatry*, *39*(5), 747–753.

Uddin, I.Q., (2011). The self in autism: An emerging view from neuroimaging. *Psychology Press. 17* (3), 201–208.

Wang, Q., DiNicola, L., Heymann, P., Hampson, M., and Chawarska, K. (2018). Impaired value learning for faces in preschoolers with autism spectrum disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 57*(1), 33–40.

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders*. 9, 11–30.

Table L Comparison of mean sm i,es **between tbe :g m ups** in **tbe hum.an fig=e drawing.s (s elf, fatb,er, motber)**

	H=an Figure (self)	M ale h=an figur (Fdher)	Female h=an figur (M:oth er)
Ohlldren Antism (N=6)	153 **SD =** Oa81	14 -8 SD = 0 .75	15.3 SD = 0 5 1
Ohlldren **TI>** (N=6)	*173* SD = 13	16 SD = 13	185 SD = 1.3-7

***max score 20**

Tab]e2„Coonpa:r:ison ofmem sco1les between the group iD tbe bouse figu11e ,dra willg.s (house1, own house, 1leJatii-es' house)

	Hou se 1	Own House	R elatives ' House
Children Autism {N=6)	13 SD = 0 .63	14 -1 SD = 0 .7 5	12.3 SD = 0 .8 1
Children m, {N=6)	158 SD = 1.60	1 J SD = 1.16	16.3 SD = 1.0 3

***max score 20**

Table 3. Comparison ofmean scores between the groupsin "Drawa Design":rubtest

	"Draw a De-sign" subte-St
Children Autism (N=6)	12.8* SD = 4.6
Ghildren îD (N=6)	16.2* SD = 2.7

***mu soore** Ill

Table4. Soores between the twogvoups in a.D **hummfigure dra.wings ,(self, father, mob-er)**

	AUTISM						1D Chi]d!ren					
	child l	child 2	child3	child 4	child 5	child **6**	child l	child2	child 3	child 4	child 5	child 6
.Self figure	**16'**	**16**	15	**14**	**16**	15	**17**	**18**	**19**	**l S**	1 5	17
Fath figure	15'	**14**	15	**14**	**16**	15	1 5	**16**	17	17	**14**	17
Moth figure	**16'**	15	1 5	**16**	15	15	**IS**	17	20	20	17	19
Total	4 ••	45	45	**44**	**4**	45	50	51	56	55	**46**	53
Me.an	**15.6'**	15	1 5	**14.6**	**15.6**	15	**16.6**	**17**	**18.6**	18J	l 5J	17.6
.SD	0.5	l	0	115	0.5	0	u	**1**	U2	U2	U 2	11 5

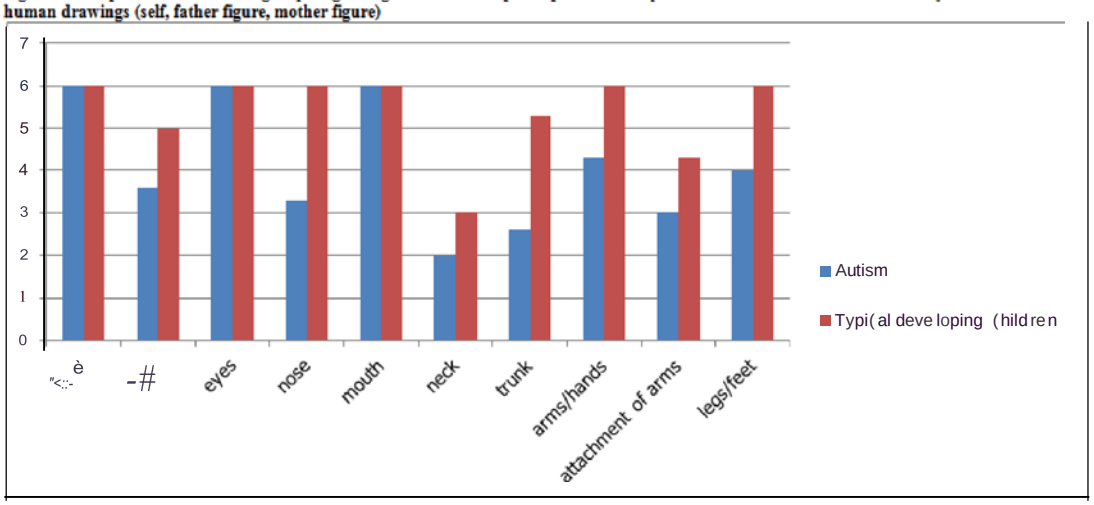
• **mn** sco e 20
H-mn sco e 60

T a.hie 5., S co es betw,een fü e twogroups in a.D bo use 6g UJ1e dra wings (bouse l , own bouse, rPJa&.-e's bouse)

	AU'FISM						TD Children					
	cliild l	child 2	cliild 3	cliild 4	child 5	child 6	cliild l	cliild 2	child 3	child 4	cliild j	child 6
Home l	13	13	14	13	13	12	I	I	I	16	13	l j
Own Hou.e	**14**	15	1 5	14	14	13	18	18	l S	I	15	l
Rela,ti\ e' .s Home	13	13	B	12	**11**	12	16	**1**	18	15	16	16
Total	40	41	42	39	38	40	51	52	53	48	44	48
Me.an	13.3	B. 6	14	B	12.6	B J	1	1 J	1 .6	16	14.6	16
.SD	0.57	1.15	I	I	1.52	0.57	I	0.57	0.57	I	15 2	I

•**mn** -score 2-0
" "'**mn** -s core 60

Figure 1. Comparison between the groups regarding the number of participants who depicted each human feature of McCarthy's list to all their human drawings (self, father figure, mother figure)



Figur e 2. Co :mpuis oo bem;eeo th e groups 1leg a.rdin g th e oum be r of pa.rtidpants wb,o depicted each bous·feature of Lee & Hobsoo 's fu t to a.ll th eir b,ou;se ,dra w.in (bo u ; l , e w s 1n use, 1leJatnre 's bo us: l

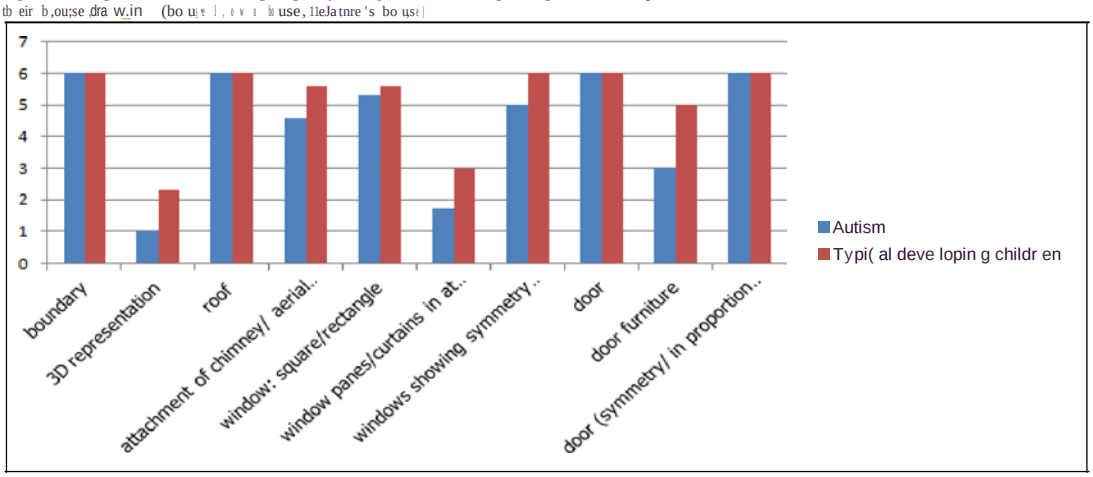
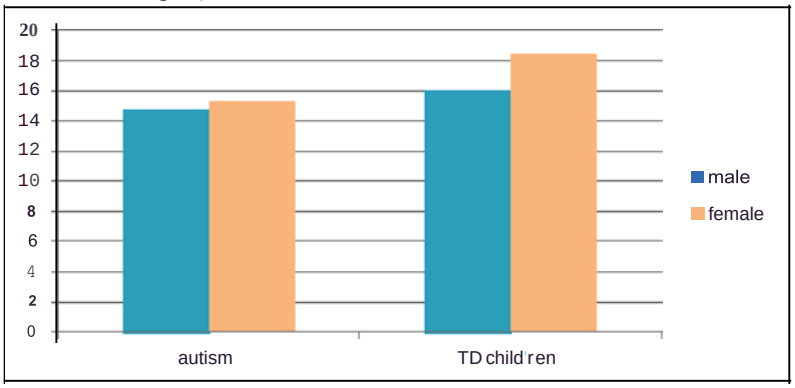


Figure 3. Compuis on of me:i.n S()ore;s betw,een the groups for the dn wings of the two gendn (fatber & motber bum au figu1'e)



Figur,e 4 . Compa.risoo betweeo the meil.D .soor,e.s o f the two group.s in "self" & sa.me geod er figure d.rawings

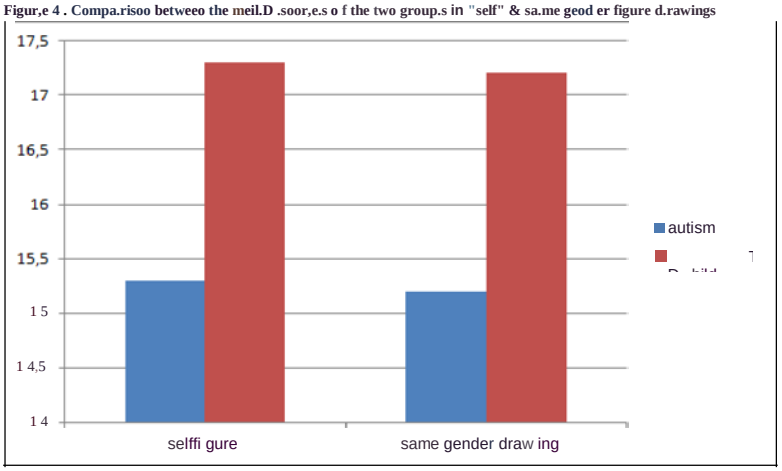


Figure 5. Compa.risoo betweeo the mea.o sco res of the two groups in "ow ho u.se" & "'bo u.se 1 drawin:gs

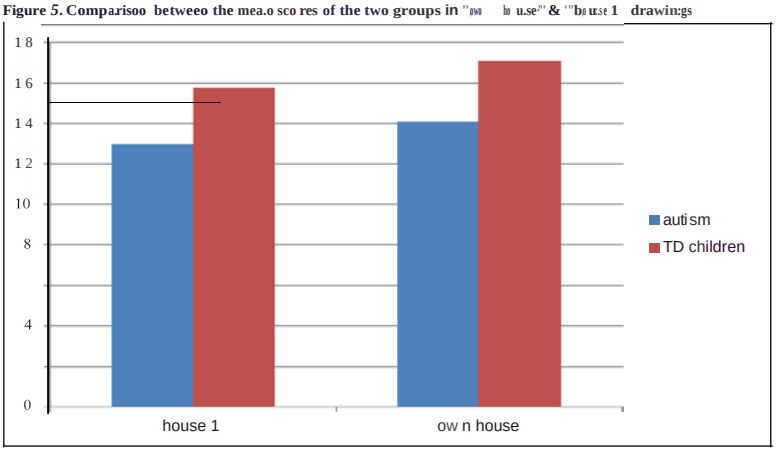


Figure 6. Comparison between the mean scores of the two groups in house 1 & relative's house drawings

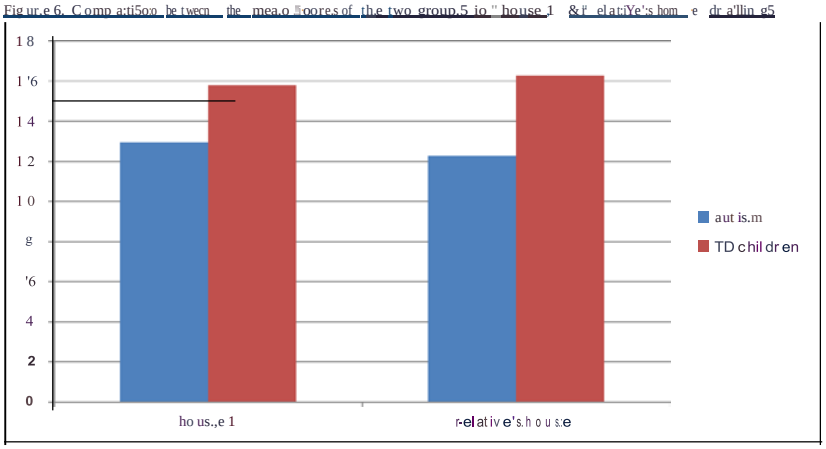
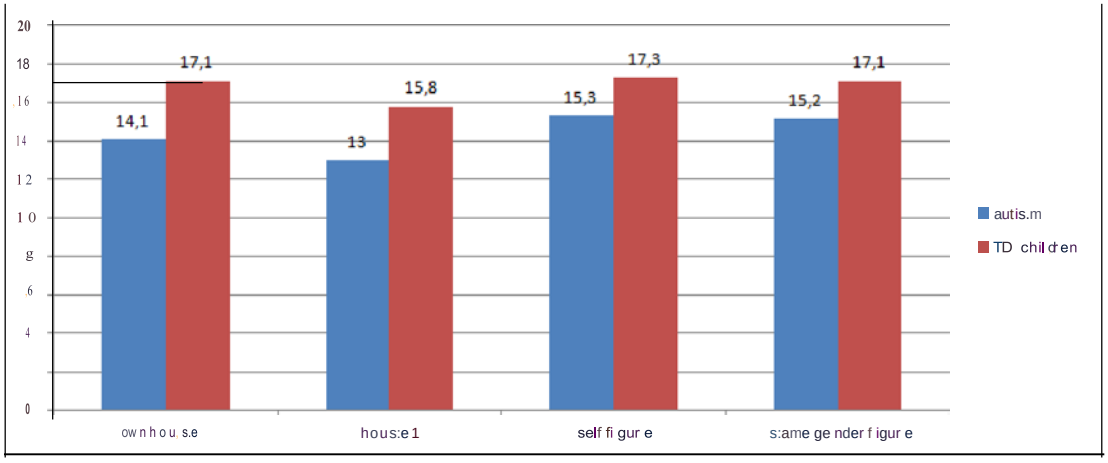



Figure 7. Comparison of mean scores or ilutistic and TD group between "self" & same gender figure drawings