

A PSYCHOLOGICAL READING OF AUTISM SPECTRUM DISORDERS THROUGH THE WARTEGG-CWS

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Abstract

Autism spectrum disorders (ASD) constitute a relatively heterogeneous set of neurodevelopmental disorders characterised by social-communication impairments and the presence of repetitive and restricted behaviours, activities, and interests. These core characteristics determine developmental anomalies in both cognitive and relational profile and are often responsible for delays or atypical evolution in the acquisition of language as well as in all those symbolic activities that require a good internalisation of experiences. The present study involved 36 children aged 6 to 12 years old with a diagnosis of autism who, after a therapeutic path, achieved the ability to represent real world objects with drawing, the cognitive understanding to perform required tasks, and the linguistic and metacognitive ability to comment on one's own drawing production. These children were administered the Wartegg test, which is a projective, semi-structured drawing technique, with proven reliability and validity, which allows for a psychological assessment from the age of 5 (age is related to abilities). We were interested in highlighting how children with ASD can represent the contents of their internal world and understand which aspects appear more problematic in their experience to guide the therapeutic response. The results of this research confirmed the presence, in children with ASD, of traits of rigidity, closure, and lack of flexibility towards stimuli coming from the outside

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world, such as to interfere with their ability to attune into the environment and adapt to it in a functional way. The data also show a prevalence of the emotional-affective component over the rational and control one, and an impairment of the possibility of exercising conscious control over one's own experiences. Finally, the results of this study highlight the presence, in children diagnosed with ASD, of elements attributable to a psycho-affective structure characterised by a greater deflection of mood than in typically developing children.

Keywords: Wartegg test; autism spectrum disorder; psychological assessment; children

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterised by persistent impairments in communication and social interaction, combined with the presence of a limited or repetitive repertoire of behaviours, interests, or activities, whose symptoms manifest in early childhood, thus limiting adaptive functioning (DSM-5, APA, 2013). As part of the assessment of subjects with ASD, limited attention has been given to the psychological assessment of children (Sappok et al., 2013). The characteristics of the disorder, in fact, make it extremely difficult to administer standardised tests to these subjects, which would allow for collecting reliable information on the organisation of the psychic dynamics that characterise their internal world (Grondhius & Aman, 2012). In particular, the deficits of social-emotional reciprocity, understood as the ability to relate to others by sharing their thoughts and feelings, make it difficult for these children to initiate social interactions, share emotions, and imitate the behaviour of others (APA, 2013; Di Renzo et al., 2017), hindering the possibility of proposing, to subjects with ASD, instruments that allow to detect the presence of tensions and conflicts or any peculiarities that may distinguish their psycho-affective organisation.

Although indispensable for the purposes of a correct diagnostic classification, previous studies (Di Renzo et al., 2016, 2019) have emphasised the importance of integrating clinical-diagnostic evaluation with tools that analyse the various levels of functioning of the child, in order to trace a reliable development profile, which integrates the definition of the diagnostic framework with information suitable for planning therapeutic interventions calibrated to the potential of each subject and to the specific developmental trajectory.

In relation to impairments in personal, social, and scholastic functioning and the impact that autistic symptoms can have on all dimensions of development, in the context of daily life and on the psycho-affective sphere of children (APA, 2013), it seems useful to call attention to an area that has remained largely unexplored today. Although over these years, in fact, the needs related to early identification and diagnosis have given priority to the detection of predictive and descriptive signals and symptoms of the disorder (Di Renzo et al., 2021), it is impossible not to consider the importance assumed by the possibility of collecting information also on the psycho-affective development of children with ASD.

The presence of vulnerabilities affecting these aspects, together with the hypothesis of altered connections between emotions, sensory processing, motor planning, and symbol formation could hinder, in children with autism, the development of intentional behaviour and adequate problem-solving, with repercussions on reciprocal interactions, on empathic capacity, and on the development of the theory of mind (Di Renzo et al., 2017; Gallese, 2001, 2006; Gallese & Rochat, 2018; Vulcan, 2016; Baron-Cohen, 1991; Greenspan & Wieder, 2000).

Research conducted in recent decades about the psycho-affective organisation of the ASD child have found the presence of lower levels of emotional contagion in these subjects compared to peers with typical development (Scambler et al., 2007; Hepburn et al., 2008; Beall et al., 2008), probably due to the difficulty in tolerating an intense emotional-cognitive state and to differentiate the emotions of others from one's own (Trevarthen & Delafield-Butt, 2013). In this regard, Smith (2009) hypothesised that people with autism have a deficit of cognitive empathy but a surfeit of emotional empathy. The behavioural characteristics of autism might be generated by this imbalance and a susceptibility to empathic over-arousal. This assumption is the basis of the empathy imbalance hypothesis, which distinguishes the affective and cognitive component of empathy and attributes the affective dysregulation of autistic children to an imbalance between the two components. The lower emotional response of children with autistic symptoms supports this hypothesis, suggesting the presence of defensive behaviours implemented by children with ASD to protect themselves from stimuli perceived as excessively intense.

Considering what has been described so far, being able to use a tool capable of identifying, in subjects with autism, the presence of tensions and conflicts on the internal world level, allows a more in-depth and global reading of

their development profile, reducing the risk that their emotional-affective needs remain unfulfilled due to the deficits inherent in the disorder.

As well as the standardised tools necessary for diagnosis, first of all the ADOS, Autism Diagnostic Observation Schedule (Lord et al., 2005) can be used to elicit behaviours directly related to autistic symptoms. The use of drawing projective techniques, such as the Wartegg test, allows the emergence of experiences related to the internal world. In the field of psychodiagnosis, these tools enjoy a long and consolidated tradition (Passi Tognazzo, 1999). The Wartegg test has a theoretical structure and statistical solidity (Palm & Crisi, 2018; Soilevuo Grønnerød & Grønnerød, 2012), such as to be an extremely effective tool in combining both quantitative and qualitative data collection and allowing different levels of reading (formal indexes, drawing, contents).

Regarding its characteristics, as a drawing, projective, semi-structured instrument, the Wartegg test elicits differentiated response methods in the subject according to the prevalence of perceptual aspects, processes linked to the evocative character, externalisation, and projection. In this way, the drawings made can vary from executions in which purely perceptive elements predominate, to those in which contents relating to one's own internal world are projected in the drawing, in symbolic or metaphorical form. In accordance with the projective hypothesis of Rapaport (1977), more recently Castellazzi (2018) reiterated how every mental representation and action, however apparently irrational, has a sense and a purpose that respond to the psychic organisation of the individual (needs, conflicts, defence mechanisms, cognitive styles, object relations). Projective tests therefore provide the opportunity to know how the subject lives his/her experiences and grasps reality, helping to inform the clinician on the state of the psychic organisation of the examined subject.

The Wartegg test, by virtue of the simplicity, immediacy, and meaningfulness of the stimuli that constitute it, can weaken the defensive structures of the examined subject, favouring the projection of the organising principles of the psychic structure. As described in depth in previous publications (Di Renzo et al., 2016, 2020) the diagnostic evaluation process of a child with ASD implemented at the Institute of Ortofonia (Rome) follows a global, comprehensive approach, which involves the evaluation of the nuclear aspects of the disorder and the additional domains to describe the different levels of functioning of the child.

Taking charge is based on a constant integration between assessment and therapy, so that the data collected, in addition to being fundamental for the purposes of the diagnostic framework, allow for a reliable development profile, respectful of the specificity of everyone. In this perspective, psychological evaluation is also of great importance, as a necessary tool to define the psycho-affective structure of the child. The latter, together with the more strictly clinical-diagnostic one, helps to describe the child's individual development profile and makes it possible to identify any factors, the knowledge of which can be decisive for achieving an optimal therapeutic result.

To place the therapeutic intervention in the zone of proximal development (Vygotsky, 1934), where it is realistically possible to guide the child in the acquisition of gradually more evolved skills, the evaluation must take into consideration all the possible modalities through which the child with ASD expresses him/herself. Among these, in the developmental age, drawing is one of the best tools for assessing the level of maturation reached by the child in the various areas of development (psychomotor, cognitive, and emotional). It also represents a precious possibility of communication, both in the educational and therapeutic fields, capable of providing information on the ways in which the internal world of the subject is being organised (Di Renzo et al., 2017).

The initial hypothesis of this study is that subjects with ASD have a personality structure, in global and dynamic aspects, that is different from neurotypical subjects regarding development, growth, and quality of psychological resources. We assume that it is possible to observe, by administering the Wartegg test to ASD children according to the Crisi Wartegg System - CWS (Crisi, 1998; 2007), traits of greater rigidity and closure compared to children with typical development, as well as the presence of elements of imbalance, tension, and malaise that hinder the rational control of one's own experiences and a psycho-affective structure characterised by a deflection of mood.

Objective

The aims of this work are, therefore, the following:

1. Verify that in the children of the ASD group there are higher levels of rigidity, closure and lack of flexibility towards stimuli coming from the outside world compared to the control group. The hypothesis is that children of the ASD group obtain lower scores in the Evocative Character Percentage variable (EC +%) and higher scores in the Popular Responses variable (P+%);

2. Investigate the presence in the ASD group of a lower ability to adapt to external stimuli. The hypothesis is that the children of the ASD group obtain lower scores both in the variable Evocative Character (EC) and in that of Formal Quality (FQ), both evaluated in Box 6 of the Wartegg Test; moreover, it is expected that Box 6 is evaluated more negatively than in the control group, *ie* it has higher values in the Ambivalent Choice, Negative Choice, Ambivalent Delay and Delay variables;

3. Verify that the children of the ASD group have lower ability than control group to exercise intellectual control over emotional-affective manifestations. The hypothesis is that ASD children show lower scores in the variable Percentage Formal Quality (FQ%) and a higher affective Quality than the Formal Quality in the A/F ratio;

4. Verify whether there is a greater affective predisposition to depressive symptoms in the children of ASD group compared to the control group. The hypothesis is that the children of the ASD group obtain lower scores in the variables Affective Quality Percentage (AQ%) and H (Human) Content Percentage, and higher in the IST variable.

Method

Participants

The research sample was made up of 36 male children diagnosed with ASD (ASD group), aged between 6 and 12 years ($m=8.35$; $SD=1.95$). The ASD group was divided into two subgroups: 16 children between 6 and 7.11 years ($m=6.42$; $SD=.96$) and 20 children between 8 and 12 years ($m=9.39$; $SD=1.12$).

Most of the children were of Italian nationality (98%) with an Asian minority (2%). At the time of the first evaluation, all children were confirmed to be diagnosed with ASD according to the diagnostic criteria of DSM-IV-TR and DSM-5, with a score on the Autism Diagnostic Observation Schedule, First Edition (ADOS, Lord et al., 2005) indicating its severity.

At intake the 65% of children were classified as severe autism and the 35% as moderate autism. At the time of administration of the Wartegg test, the children had an average Intelligence Quotient score of 84.62 ($DS=15.48$) and an average ADOS score of 8.60 ($DS=3.89$).

Children with certified neurological damage, children with sensory disabilities, and children under the age of 6 were excluded from the study, as they were unable to perform the Wartegg test. Furthermore, only male children were

selected since, while reflecting the ratio of males to females in the population of patients with autism (4:1), the number of females was too low, and this would have made the sample inhomogeneous.

The control group (CNT) was a sample of 36 male children extracted from the normative sample of Italian developmental age (1.385 subjects, 723 males and 662 females), aged between 5 and 12 who incorporated a previous normative sample of 282 subjects (males=159, females=123) (Bianchi et al., 1998). The sample of 36 male children exactly matches for age with the characteristics of the ASD group.

Instruments

The Wartegg test is a semi-structured projective drawing technique, which can be used with subjects aged 5 and over (Crisi, 2007, 2018). The tool can be used both in the clinical and in the selection and orientation fields. The version that was used in the present study was constituted by a module that contains eight boxes (R), numbered from 1 to 8, arranged in two parallel rows of four and divided by a large black margin. A simple sign is printed in each of the boxes. In the first, a dot is placed in the middle of the space; in the second, a wavy line is positioned at the top left; in the third, three vertical, parallel lines, increasing from left to right, rest on the edge; in the fourth, a small black box is in the top right; in the fifth, at the bottom, in the left corner, are two lines opposite and perpendicular to each other; in the sixth are two lines, one horizontal at the top and one vertical on the right; in the seventh, at the bottom towards the right corner, a series of dots arranged in a semicircle open upwards; in the eighth is the upper arc of a circle facing downwards. Each test Box provides information on specific psychic areas. Box 6, for example informs about the subject's ability to organize, resolve and operationally manage tasks and requests from the environment. The test was administered to each child of the research sample and then scored according to the CWS (Crisi, 1998, 2007). The scoring elements give life to multiple indices (percentages, ratios, etc.) that describe the organisation of thought processes and allow for the construction of a development profile of the examined subject, capable of analysing and defining both the adaptive and affective functioning profile.

In particular, the following indices have been taken into account in this research:

- *The Evocative Character* (EC/EC+%) is indicative of the subject's ability to tune in with the stimuli coming from the outside world and adapt to them appropriately.

It is positively evaluated if the subject has the ability to grasp the Evocative Character of the stimulus sign present in each Box, that is if the drawing picks the implicit suggestion of the stimulus sign (Box 1=centrality and relevance; Box 2=vitality and movement; Box 3=directionality and dynamic progression; Box 4=heaviness and stability; Box 5=dynamic overcoming of an obstacle; Box 6=synthesis and structuring; Box 7=delicacy; Box 8=rounding and closing);

- *Affective Quality* (AQ/AQ+%) indicates the emotional connotation (positive, neutral, negative) expressed by each design;

- *Formal Quality* (FQ/FQ+%) is the ability to grasp the salient characteristics that make the design immediately recognizable by the others;

- *Ratio A/F* (or Affective Quality/Formal Quality) informs about the balance between affective and control aspects;

- *Frequency* (P%) refers to the presence of drawings with original contents;

- *Contents* refer to what the subject has drawn and are divided into: primary contents (human beings, animals, objects, natural contents, abstracts, symbols, etc.) or secondary (additional elements concerning fantastic content, games, weapons, figurative arts, masks, clothing, etc.);

- *IST* is the most important depression index present in the test, and it is calculated based on the presence of specific values (Opposite Directionality; Morbid, AQ+%, etc.) that clinically suggest the presence of a depressive state;

- *Order of Execution* (Oos) is the order that the subject follows when making his drawings.

The administration provides that the subject uses a pencil number 2 (HB) well pointed. The use of the rubber is not allowed. Then, after placing the paper form in front of the subject, you ask him to create a drawing of complete sense, taking inspiration from the target stimuli present in each Box. The subject is invited to start from the box that inspires him more, specifying that it is not necessary to follow the numerical order and that it is important that the sign present in the box becomes part of their design.

For further details on the administration, scoring and interpretation of the various indices, please refer to the test manual (Crisi, 1998, 2007).

Procedures

Participants were recruited from the Institute of Ortofonia (Rome). In this study, we enrolled children admitted between 2014 and 2018 for an autism spectrum disorder clinical suspicious; the psychodiagnostic assessment was

conducted by a team of qualified clinicians (with at least 10 years of experience in the field of autism) consisting of psychologists/psychotherapists, neurologists, paediatricians, child neuropsychiatrists, and rehabilitation therapists. The diagnosis of autism was based on the DSM-5 criteria (APA, 2013). Once the diagnosis was confirmed, the children were included in the Turtle therapeutic project (DERBBI model, Di Renzo et al. 2020) for at least 4 years of therapy. DERBBI is the acronym for Developmental Emotional Regulation and Body-Based Intervention; the model focuses on communicative interactions with children and on the role of the therapist and caregiver as mediators capable of helping the child to regulate their reactions to external or internal stimuli perceived as disturbing. The specific feature of this intervention is the use of the therapist's body as a communication tool in the relationship with the child, in order to enrich the emotional exchange in the dyad (Di Renzo et al., 2007, 2020).

During therapy, the children were re-evaluated in cognitive and emotional domains, and when they have acquired good graphic-motor skills to be able to carry out a graphic test, like the Wartegg test, they were included in the present research. The test was administered to each child individually; each administration lasts about half an hour. Subsequently, the protocols were scored by an expert professional assessment who was not aware of the group to which the examined children belonged (blind method).

Data analysis

To evaluate the difference between group (ASD vs CNT) on means of Wartegg scores, t-test analysis was conducted. To analyse the difference between the Wartegg scores expressed in percentage frequencies, a Chi-square analysis was conducted. The significance level was set at $p < .05$. All statistical analyses were performed using SPSS software version 19.0.

Results

The results obtained by the children of the ASD group were compared with those of a control group (CNT), that is composed of children randomly extracted from the normative sample of the Wartegg Test for the developmental age (so that the two groups, experimental and control, were identical in both gender and age) and examined with statistical analysis.

To verify the first objective of the research, that is the presence of traits of greater rigidity, closure, and lack of flexibility towards stimuli coming from the outside world, the values obtained were taken into consideration in the Evocative Character (EC +%) and in the percentage of Popular Responses (P%).

The Evocative Character provides us with information on the degree of openness to external stimulation. Data analyses showed that the mean of Evocative Character in the ASD group aged 6 to 7.11 (ASD=45.1%) was significantly lower than that of the control group (CNT=72.4%; $p<.00001$). Even in the 8 - to 12-year-old group, the difference was still statistically significant (ASD=54.2%; CNT=73.6%; $p<.001$).

A further index capable of providing information about the level of adaptive functioning is represented by the percentage of Popular Responses (P%). This index provides us with data on how much the examined participates in the collective way of thinking and shares a common way of thinking. The contents represented in the drawings made by ASD children are evaluated by comparing them with the frequency with which they are usually present in the normative sample. "Popular" (P%) responses are defined as those present in more than 18% of cases; are defined "Semi-popular" those realized by a percentage of subjects ranging from 10 to 17.9%.

The responses provided by children with ASD in this index indicate the presence of a statistically significant difference between ASD children and CNT group aged 6 to 7.11 years (ASD P%=17; CNT P%=33.7; $p<.002$), indicating less participation in the common way of thinking. Unlike in the 8 - to 12-year-old group, the difference was not statistically significant (ASD P% 28.5; CNT P%=23.3; $p=ns$).

Taking into consideration the second objective of the research, that is the hypothesis that, due to the deficits that characterise the disorder, autistic children may have a reduced ability to represent the world and operate concretely, in an adequate and functional way, on the stimuli proposed by the external reality, the scores obtained in Box 6 in the Evocative Character (EC) and in the Formal Quality (FQ) were related. Data analysis shows that these indices were lower in both age groups of ASD children, from 6 to 7.11 years and from 8 to 12 years (EC $p<.01$; FQ $p<.00001$).

Also, as shown in Table 1, a significant difference between ASD and CNT children aged 6 to 7.11 ($p<.004$) and between ASD and CNT children aged 8 to 12 years ($p<.05$) were found about values indicating a negative assessment in box

6 (Ambivalent Choice, AC; Negative Choice, NC; Ambivalent Delay, AD; Delay, D): 62% of ASD children aged 6 to 7.11 years show a negative assessment compared to 19% of control children. Similarly, 60% of ASD children aged 8 to 12 get a negative assessment compared to 15% of the control group.

Table 1. Evaluation of Box 6 in the Analysis of Sequence 1

Range	Positive Codes (C+PC)		Negative Codes (AC+AD+NC+D)	
	ASD	CNT	ASD	CNT
6-7.11 (N=16)	6 (38%)	13 (81%)	10 (62%)	3 (19%)
8-12 (N=20)	8 (40%)	17 (85%)	12 (60%)	3 (15%)

Note: ASD=Autism Spectrum Disorder Group; CNT=Comparison Group; C=choice; PC=positive compensation; AC=Ambivalent Choice; AD=Ambivalent Delay; NC=Negative Choice; D=Delay

In order to verify the third objective, that is the presence of a lower ability, on the part of children with ASD, to exercise intellectual control on the manifestations of an emotional-affective character, the results obtained in the Formal Quality (FQ +%) and in the Affective Quality/Formal Quality (A/F) ratio were examined. The results obtained from the examined sample indicated a statistically significant difference between ASD and CNT group ($p < .00001$) both in the children aged 6 to 7.11 years and in children aged 8 to 12 years. In particular, the control group obtained an average score of the FQ +% of 90.8% in children aged 6 to 7.11 years and 90.4% in children aged 8 to 12 years, showing adequate skills in this area. On the other hand, in the group of children with ASD, the average value of the FQ +% was found to be 64.6% in the 6- to 7.11-year-old group and 72% in the 8 to 12 year-old group. Although a slight increase was observed in the group of older children, the FQ +% value was lower than that of the control group.

In line with the results described above, analysing the data relating to the Relationship between Affective Quality and Formal Quality it is possible to observe how, in 60% of children with ASD aged 6 to 7.11 years, there was a prevalence of emotional-affective aspects over formal ones ($A > F$). In the control group, this same percentage was in the opposite direction, *i.e.*, it showed a prevalence of formal elements over emotional-affective ones ($A < F$). In the group of children with ASD aged 8 to 12 years, the trend remained the same, but with a lower number (40% of children had less ability to control, compared to 25% of the sample of the CNT group).

To verify the fourth hypothesis, namely that, by virtue of socio-communicative anomalies and difficulties in social interaction, the psycho-affective dynamics in children with ASD can be characterised by a basic emotional

disposition with a depressive background. The scores of the two groups were analysed regarding the Affective Quality, the value of the IST, and the percentage of H (Human) contents.

With reference to the Affective Quality (AQ +%) in the group of children with ASD, the analysis made it possible to highlight the absence of a significant difference in children between 4 and 7 years (ASD AQ+%=50.2; CNT AQ+%=59, 4; p=ns) and a trend towards significance in the group of children aged 8 to 12 years (ASD AQ +% = 51; CNT AQ+%=57.2; p=ns but .096). In both cases, children with ASD obtained a lower score in the evaluation of this index than the control group, with AQ +% values that were located at the lower limit, compared to those expected, indicative of a lower level of openness towards the external environment and a mood that tends to be oriented in a depressive sense.

In support of what has just been reported, there were also significant differences in the IST index, the highest of the depression indices present in the CWS, which is calculated based on the presence of specific values (Opposite Directionality or OD; Morbid or MR, CLD, AQ +%, Sequence Analysis 1) which clinically suggest the presence of a depressive state. Compared to the IST, the value obtained by children with ASD in this index was greater than the control group with a significant difference from the statistical point in children aged 4 to 7.11 years (ASD=ITS 6.6; CNT=ITS 4, 8; p<.01), and in that of children aged 8 to 12 (ASD=ITS 6.8; CNT=ITS 3.9; p<.00001).

Even the presence of a lower number of Human Contents (H) in the group of children with ASD, compared to the control group, although not statistically significant, could support these data. The average percentage value of H contents was lower in the group of children aged 4 to 7 years (ASD=H% 7.1; CNT=H% 11.1; p=ns) and in that of subjects aged 8 to 12 years (ASD=H% 10.1; CNT=H% 12.1; p=ns).

Discussion

By carrying out the test, all 36 children with ASD in the research sample demonstrated that they had achieved the ability to attune with each other and the proposed stimuli, to the point of understanding, correctly performing and representing, as well as commenting verbally, on the drawings made. The Wartegg test, in order to be performed, requires that the child is able to listen to the request made by the examiner, understand it, integrate the signs-stimulus within a drawing with meaning and communicate its content to the other.

The results that emerged support the initial hypothesis, *i.e.* that children with ASD have a personality structure, both in global and dynamic aspect, different from subjects with neurotypical development.

In particular, the value of the Evocative Character indicates the presence of a development profile characterised by traits of rigidity and lack of flexibility significantly higher in the group of subjects diagnosed with ASD than in the control group, such as to make it more difficult for the former with respect to the latter, being able to 'attune' with the demands posed by the external environment, and adapting to them in an adequate and functional way. The score of the Evocative Character in the Wartegg Test constitutes an important psychodiagnostics factor, describing the ability of the examined subject to enter into a relationship with the stimuli proposed by the test. In a broad sense, this index provides information on the presence of intact perceptual functions and associative processes, the ability to adapt to common thinking and adaptation to the environment. When the value obtained by the examined subject falls within that of the standard reference sample, the ability of the individual to enter into a relationship with the outside world is indicated (Crisi, 1998, 2007). The lower score obtained by children with ASD, compared to the control group is therefore indicative of a lower openness towards the environment and the presence of traits of rigidity that hinder adaptive functioning.

In fact the findings show that ASD children have greater difficulties in capturing the perceptual aspects offered by the Evocative Character of the target stimulus; for children with ASD seems to be very difficult to properly tune with the target stimuli of the test and to grasp the gestaltic and symbolic aspects related to the stimulus signs present in the different box. This confirms the initial assumption that ASD children have such high closure traits that they hinder their ability to relate to the outside world. The process of responding to the Wartegg Test, in fact, involves the use of perceptual abilities, closely related to the laws of visual perception (proximity, similarity, closure, significance and common destiny) and requires the subject to associate the test stimuli with a specific evocative meaning. The scores obtained by the children with ASD in the Evocative Character variable, are indicative of their difficulty to tune and grasp the suggestions offered by the stimulus in each box, that is: centrality and relevance (Box 1), vitality and movement (Box 2), directionality and dynamic progression (Box 3), heaviness and stability (Box 4), dynamic overcoming of an obstacle (Box 5), synthesis and structuring (Box 6), delicacy (Box 7), rounding and closing (Box 8).

To confirm this, ASD group aged 6-7.11 years showed lower scores than control group in the percentage of Popular Responses. This index indicates that in ASD children there are less ability to adhere to the collective thinking and adapt to reality (Crisi, 1998, 2007). However, no significant difference emerged in older ASD children, suggesting that even in children with ASD there is a tendency to provide more conventional responses with advancing age.

In this regard, it is interesting to note how the most negative evaluations in the Evocative Character and in the Formal Quality of box 6 of the Wartegg Test were obtained from the children in the ASD group. Box 6 provides information on a child's ability to deal with, solve, and manage problems and demands posed by the external environment. The negative evaluation (Ambivalent Choice; Negative Choice; Ambivalent Delay; Delay) obtained in the realisation of this box by the children of the ASD group, which from the evocative point of view refers to the concepts of structuring and synthesis, indicates a greater difficulty in representing the reality of children with ASD compared to the control group, which interferes with their ability to operate effectively, in an adequate, functional, and autonomous way, with the stimuli presented by the outside world. The negative evaluations (Ambivalent Choice, AC; Negative Choice, NC; Ambivalent Delay, AD; Delay, D) obtained from the Sequence Analysis 1 are also indicative of the presence of tensions in the relationship with the psychic area evoked by the box, demonstrating how the relationship with external reality represents for subjects with ASD an element capable of activating experiences of ambivalence and conflict.

In light of what has been discussed so far, it seems necessary to reflect on the possible interference that the difficulties described may have on the organisation of the psycho-affective dynamics of children. The Wartegg test also allows an evaluation of how the adaptive and affective aspects relate to each other, helping to define the psychic organisation of the examined subject.

The data that emerged with respect to the A/F report (Affective Quality/Formal Quality) are interesting. This index describes, in fact, the way in which affectivity and rationality are related to each other in the examined subject. The normative value of this relationship for Affective Quality and Formal Quality is 2.5 for A and 4 for F. The Formal Quality (FQ +%) informs about the integrity of the subject's intellectual processes, both in a quantitative (intellectual level) and qualitative sense (attention, concentration, planning, anticipation, concept formation, adaptation to the secondary thought process, etc.). More extensively, it helps to describe the subject's ability to get in touch with the outside world and informs on

the level of conscious self-control reached by them, *i.e.* the level of intellectual control that the individual is able to exercise over the manifestations of an emotional-affective character (Crisi, 1998, 2007). Affective Quality (AQ) is assessed on the basis of the affective connotation assumed by the drawings made by the subject and is therefore descriptive of the basic affective disposition of the individual undergoing the test, or how the affectivity is oriented. This index also allows for an evaluation of the presence of removals and the degree of harmony that the examiner can achieve in the relationship with the environment (Crisi, 1998, 2007). What described so far highlights the presence of important difficulties in the Formal Quality of the drawings of ASD children which is evaluated on the basis of the criterion of “evidence”, that is, the ability of the subject to reproduce the essential elements of a figure, such as to make it easily recognisable and identifiable. The prevalence of the emotional-affective element over rational and control ones ($A > F$) confirms the initial hypothesis that children with ASD have greater difficulty in exercising intellectual control over emotional-affective manifestations and supports the Theory of Empathic Imbalance by Smith (2009) that differentiates the affective and cognitive component of empathy and attributes affective dysregulation of children with Autistic Spectrum Disorder to an imbalance between the two components.

These results confirm what was also observed by Samson et al. (2012) regarding the manifestation, by the ASD child, of an intensified emotional reactivity, which can generate difficulties of varying degrees in emotional regulation. Overwhelmed by his/her own affectivity and unable to find a channel of expression appropriate to his/her needs, the autistic child could be led to amplify stereotyped behaviours in an attempt to find relief from the tension perceived on the level of the internal world.

The organisation of psycho-affective dynamics appears, in fact, to be characterised by a tendency to deflect mood and the presence of depressive experiences. As indicated by the higher values of IST in the ASD group, the research data therefore confirm the presence of graphic realizations characterized by less positive affective connotations, and by contents and phenomena indicative of a deflected mood tone.

These characteristics could prevent the children from expressing their resources in the best possible way, hindering their ability to channel their emotional energies in a functional way in the direction of adaptation to the outside world.

In support of the above, there were also significant differences in the Depression Index (IST). These data confirm the results that emerged in recent

research (Magnuson & Constantino, 2011; Dickerson et al., 2011; Stewart et al., 2006)) that investigated the presence of indicators attributable to the presence of a tone of the depressive-oriented mood, suggesting the need to systematically assess the presence of these symptoms in children with ASD and perform further research in this area.

Conclusions

The data collected in the context of this study demonstrate how it is possible to integrate the clinical-diagnostic evaluation of children with ASD, who have reached a sufficiently mature graphic level, with a psychological evaluation aimed at defining their organisation of psychoaffective dynamics. These elements contribute to give depth to the description of the developmental profile of children who, by virtue of the complexity that characterises the diagnostic picture to which they belong, risk not being sufficiently recognised in their specific affective, as well as cognitive, needs.

Previous research has shown that there is a significant correlation between the drawing production and the Affect-Social component of ADOS, demonstrating the fact that the delay in drawing is strongly influenced by an emotional as well as an intellectual inhibition (Di Renzo et al., 2017). These findings appear to be confirmed by the results of this study, which indicate the presence, in the tests performed by our sample of children, of generally descriptive elements of a tendency to mood deflection.

The data collected so far allow us to open reflections on the importance of carefully considering, in the context of the assessment and treatment of children with ASD, the affective dimension, through tools that allow us to define the organisation of internal dynamics and specific characteristics of each child, to guide the therapeutic intervention. Also, the lower degree of openness to stimuli from the outside world suggests the need to propose therapeutic paths that aim to strengthen the ability to tune and emotional reciprocity, through affectively connoted relational exchanges. In this sense, it would be useful, in the treatment of autism, to enhance both the cognitive and the affective component of empathy, providing children with channels of expression adequate to understand their needs, through all forms of expressiveness that involve the direct involvement of the psyche and the body.

Finally, the results of this work stress the need to consider the use of flexible therapeutic and psycho-educational approaches, to avoid reinforcing the rigidity

traits that characterize the development profile of children with autism spectrum disorder.

Ethics statement

The research was approved by the internal commission of the Institute of Ortofonologia in accordance with the Declaration of Helsinki. The parents of the children gave their informed consent for their participation in the research.

Consent for publication: All the authors of the research have given consent for publication

Conflicts of interest

The authors declared no conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Author contributions

Magda Di Renzo, Federico Bianchi di Castelbianco, Francesca Zaza, and Chiara Marini wrote the Introduction, Discussions, and Conclusions Sections and monitored the implementation of the entire research. Alessandro Crisi administered the tests and evaluated the children. Alessandro Crisi and Monica Rea conducted the data analysis and revised the Methodology section.

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