Austin Journal of Autism & Related Disabilities

Open Access

Austin Publishing Group

Research Article

The Emotional Contagion in Children with Autism Spectrum Disorder

Di Renzo M*, Bianchi Di Castelbianco F, Petrillo M, Racinaro L, Donaera F and Rea M
Institute of Ortofonologia (IdO), Italy

***Corresponding author:** Magda Di Renzo, Institute of Ortofonologia (IdO), Via Salaria 30, Rome, Italy

Received: March 15, 2016; **Accepted:** May 04, 2016; **Published:** May 06, 2016

Abstract

Studies of the last decade have demonstrated that children with Autism Spectrum Disorder (ASD) showed difficulties in language, social and relational areas, but they had also impairment in the mechanisms of embodied simulation, namely the imitative behaviors that allow the body to give an experiential meaning to own and other's emotions. The identification of this specific emotional response in ASD children, also defined as emotional contagion, allows to move the therapeutic focus from reducing the behavioral symptomatic expressions of the child to promoting the expression of his ability of emotional regulation. The aim of this study was to investigate the presence of emotional contagion in 53 ASD children aged between 22 and 66 months, through the Test of emotional contagion and verify the presence of compromised emotional contagion areas. Our findings have shown that the severity of the disorder is closely related to the inability of the child to respond to the emotional stimuli, regardless from cognitive abilities, and that emotion to which children responded most frequently was happiness, while the one who responded less was anger.

Keywords: Autism; Autism spectrum; Autism Diagnostic Observation Schedule (ADOS); Therapeutic efficacy; Developmental approach

Abbreviations

ASD: Autism Spectrum Disorder; TCE: Test of Emotional Contagion; ANOVA: Analysis of Variance; ADOS: Autism Diagnostic Observation Schedule

Introduction

Not many studies have examined the emotional area in ASD children, but clear evidence suggests a high level of impairment in the emotional regulation skills [1-8] as well as difficulties in language, social and relational areas. These children also showed impairment in the mechanism of embodied simulation, namely those imitative behaviors that allow the body to give an experiential meaning to own and others' emotions [9-11]. To track down the kind of emotional response that ASD children are able to put in place is important to monitor the developmental steps and have indicators that are more specific on which base the therapeutic intervention".The underlying assumption is that in ASD children the primary deficit is expected to lie in the affective area before than in the cognitive [12-14]. Smith [15] has suggested that there is an imbalance caused by an emotional overload in contrast to a deficit of cognitive strategies in dealing with the emotional responses, in managing the internal states. This assumption is the basis of the empathy imbalance hypothesis of autism [15], which distinguishes the emotional and cognitive component of empathy and attributes the affective dysregulation of autistic children to an imbalance between the two. The overload of the emotional component of empathy, in the absence of mentalizing ability that can adjust the intensity, implies that the emotional impact is too intense for ASD children. The autistic behaviors, such as the avoidance of the gaze, the restricted and repetitive behaviors and the attention to isolated parts and non-functional objects, are therefore a defensive reaction to the archaic empathic imbalance, an adaptation for living among people of whom they perceive the intense emotion without being able to understand it [16-18]. This allows to move the therapeutic focus from reducing the behavioral symptomatic expressions of the child to promoting the expression of his emotional regulation skills [19]. Brazelton and Greenspan [20] argue, in fact, that children's emotional relationships are the foundation for the development of all other representational processes. The block of the emotional development of children with autism would be at this archaic level of affective development, that is an area that Stern [21] defines of affective attunement. The affective attunement is a prerequisite in order to develop a good enough mother-child attachment relationship with mirroring and emotional containment functions that will allow the child to develop as a result the ability to recognize his own emotions and differentiate them from those of the others [22]. The emotional contagion is a primitive form of empathy and is present in the very early stages of development in which there is still a distinction between the self and the other. Buhler [23] defined the emotional contagion with the term of emotional mimicry, describing it as the correlation between the child and the caregiver in the first months of life. Hatfield et al. [24] have defined it as the innate tendency to automatically imitate and synchronize with facial expressions and thus to converge emotionally. One example is the fact that during a conversation, people automatically and continuously mimic and synchronize their movements with facial expressions, voices, postures, movements, and instrumental behaviors of their interlocutors. The emotional contagion differs from empathy because this requires the mediation of cognitive conscious process and involves the ability to understand what others feel and to attribute these experiences to others and not to themselves. The emotional contagion is instead an automatic and precognitive response of assimilation and introjection of the emotional experiences of the

Citation: Di Renzo M, Bianchi Di Castelbianco F, Petrillo M, Racinaro L, Donaera F and Rea M. The Emotional Contagion in Children with Autism Spectrum Disorder. Austin J Autism & Relat Disabil. 2016; 2(2): 1020.

other that are experienced as own [25]. According to other authors, the emotional contagion can be learned within a relationship, such as the primary, in which parent and child tend to mutually catch their emotions [26,27]. The emotional contagion and affective attunement are therefore contiguous and precursors of empathy, resulting in a multidimensional development process that involves and integrates the cognitive and affective system [15,28]. In the activation of empathy is realized an emotional processing, in the experience of mutual sharing with the other, that through the control of the executive functions allows to adjust and modulate the emotional experience, and to explain it rationally aware of the distinction between own and others experiences [29]. In ASD children, it is difficult to find a kind of empathic response, which requires a complex perceptual, introspective and communicative capacity, but above all the ability to tolerate a strong emotional-cognitive state, which highlights the difficulties of the autistic child in sensorimotor and perceptual integration and in the affective regulation [30]. It may be useful, therefore, to investigate in ASD children, the presence of emotional contagion as a precursor of the development of empathy. A neurobiological level, the understanding of the mind and of the emotional experiences of the other, is supported by the mirror neurons, which are involved in the perception, understanding and sharing of feelings and emotions. The mirror system is thus a neurobiological predisposition favoring the emotional contagion mechanisms and affective attunement, but that tends to reach its full operation in the encounter with the other, through the relationship. Some authors have emphasized a reduced ability to understand and play actions and emotions when the mirror neuron system is damaged [31-33], while others have disconfirmed this hypothesis [34-36]. In a study of Hobson and Lee [37] on ASD children, it has been shown that cognition and deficits of the theory of the mind are not the main problems of these children, but it is the social mirroring, supported by neural interactions between mirror neurons and limbic system through the insula, to be compromised. It is as if autistic children had remained fixed at a stage of development that corresponds to six months of life and, therefore, the dysfunction of the mirror neuron system would be a consequence of something that happens at a very early age. A study on the emotional resonance deficits in autistic children [38] showed a depletion in the processing of emotional and social tasks in the context of imitation. Autistic children namely would have some difficulties to modulate the imitative responses according to emotional and social cues. The finding of emotional contagion in ASD children brings new evidence to the hypothesis of an imitation disease already advanced by Gaddini [39,40]. For this reason, to detect in ASD children the emotional response given by emotional contagion may be important not only for research of empathy precursors, but also for clinical practice, and then in the choice of therapy. A recent study showed that two years old ASD children responded significantly less with emotional contagion (measured in terms of hedonic tone and latencies in the emotional response) than the typically developing children or with intellectual disabilities. They analyzed the responses of autistic children in situations where they were elicited positive and negative reactions (the experimenter opening a gift, or pretending to be injured) and then was recorded the response showed in the first 10 seconds. The authors noted as the lower emotional contagion was also related to the degree of impairment of social and communication skills of ASD children. Similarly, at 5 and 8 years of age, ASD children are described as little able to show adequate and appropriate emotions to environmental stimuli [41]. In older children (8-13 years) it will continue to observe the difficulty of emotional contagion to specific emotional expressions, such as anger and joy [42]. These results suggest the importance, from a clinical point of view, to consider the impact that reduced emotional response can have on people with whom the child relates; when the child does not show emotional contingent and appropriate reactions, the adult who is with him hardly understand the inner state and is likely to express, through time, less emotional responses. Currently, there are very few works on emotional contagion in ASD children and this is probably due to the fact that the present assessment in clinical and research tools are not very suited to clinical populations in which cognitive functioning and language are deeply compromised. Typically, these tests provide for the recognition of faces in photographs and / or videos in which actors interpret their emotions as a result of micro events or short stories. They assume, therefore, that language is present and that there is an adequate reading of the context in which emotions are expressed. Finally, the response required by this type of testing is often verbal, that is little suited to the assessment of very young children and/or with a severe autism spectrum disorder in absence of language. In this work we investigated the presence of emotional contagion in ASD children through a direct assessment with a recently published instrument (TCE, Test of Emotional Contagion) [43].

The objectives of this research are the following:

1. Verify the effect that the severity of autistic symptoms assessed with the ADOS-2 scores and classifications has on the emotional contagion responses.

2. Identify the emotional contagion areas that are more or less compromised.

3. Verify the correlation of the emotional responses of children with the intelligence level (IQ) and the ADOS 2 areas (Social Affection and Repetitive and Restricted Behaviors).

Method

Participants

The sample is composed of 53 children aged 22 to 66 months. The children were divided according to age and ADOS-2 categories: children with severe autistic symptoms over 30 months of age (AUT), children with autism spectrum disorder diagnosis over 30 months of age (SpD) and children at risk of autism under 30 months of age (RISK). The RISK group consists of 2 children at Risk 1 (mild), 4 children at Risk 2 (moderate) and 13 children at Risk 3 (severe). 51 children in the sample are characterized by absence of spontaneous speech and 2 children have simple nuclear sentences with poor grammatical structure. The overall sample is composed of children coming from Italy for the 92.5%, from Eastern Europe for the 1.9%, from Asia for the 3.7% and from Africa for the 1.9%. The 58.5% of the sample has at least one sibling and, of these, the 25.8% have one sibling with problems (2 children have a sibling with autism, 4 children have a sibling with other kind of developmental delay and 2 children have a twin with typical development).

Procedure

Participants were recruited from the Institute of Ortofonologia (IdO) in the period that goes from January 2014 to December 2015. The IdO works in agreement with the National Health System and follows the procedures for taking charge of children and their families according to the treatment plan established by the Regional Health Agency.

The diagnosis of infantile autism of the children included in the research was made by a group of experts with at least 10 years of experience (psychologists/psychotherapist, neurologists, psychiatrist, speech therapists and occupational therapists) according to the DSM-5 criteria [44] and then confirmed by the administrations of the Autism Diagnostic Observation Schedule- Second edition (ADOS-2) [45,46]. Experts involved in the assessment are not the same as those involved in therapy and in clinical work. This research meets the APA ethical guidelines. Children with neurological disorders were not included in the research, as well as children with sensory disabilities, and children over 72 months or under 21 months. This research met the ethical guidelines and legal requirements of the country in which it was conducted. The research also complied with the ethical standards of the American Psychiatric Association (APA). All subject gave written informed consent in accordance with the Declaration of Helsinki.

Instruments

Test for Emotional Contagion (TCE)

The TCE [43] enables the evaluation of the emotional contagion, from both a quantitive and qualitative point of view, that is the presence or absence of affective attunement in the child, through the observation of his emotional and behavioral response while facing a structured stimulus (video). The child is presented 4 video recordings in which a child with typical development expresses in nonverbal ways the four basic emotions: happiness, sadness, fear and anger. Each video has a duration of 43 seconds (23 seconds is the time during which the child expresses each single emotion, and then 20 seconds is the period during which the video darkens). For each emotion presented, the observer codifies on the protocol the absence or presence of the expressive mimic reproductions corresponding to the emotion stimulus and the relative body and behavioral responses of the child. The codifying protocol is made of five sections, four of which are constituted by the graphical representation on which mark the facial expression of each emotion and by the check list of 16 body expressions that allow a quantitative analysis of the emotional contagion answers. The fifth section consists of the coding summary that allows a global qualitative assessment of the emotional contagion answers. The checklist of the four sections allows to notice if the child reproduces the motor pattern of the emotion observed, if he participates actively, if comments verbally or vocalizes, if reproduces the intonation of the emotion, if he shows postural alterations, if the child approaches the observer, or if he approaches the video or retreats from it, if he starts stereotypies, if he ignores the video and so on. Each response is considered as absent if the child does not reproduce the motor pattern of the emotion and it is evaluated with 0; the response is considered present if the child reproduces the motor pattern of the emotion and it can be evaluated with 1, 2 or 3. It is scored with 1, that is principle of emotional contagion, when there is one emotional contagion response and 3/4 of hints of the stimulus reproduction; it is scored with 2, that is emotional contagion, when there are from 2 to 4 responses of emotional contagion; it is scored with 3, that is empathy, when the child recognizes the emotions and differs from his own. Furthermore, the test is used to define whether the child shows veridical empathy or almost-egocentric empathy (Hoffman, 1987). The first assumes the differentiation between the self and the other. In the quasi-egocentric empathy, even though there is the recognition of each emotion, the process of separation between the self and the other is not complete, so the child does not differentiate.

Autism diagnostic observation schedule, Second edition

All participants completed the ADOS-2 [45,46]. ADOS-2 is a semi-structured, standardized assessment of communication, social interaction, play, and restricted and repetitive behaviours. It is considered the gold standard in research protocols and is the most commonly used standardized diagnostic measure. It has strong psychometric properties, including reliability and validity. The ADOS-2 includes five modules, each requiring just 40 to 60 minutes to administer. The child evaluated is administered only one module, selected on the basis of his or her expressive language level and chronological age:

Toddler Module: for children between 12 and 30 months of age who do not consistently use phrase speech. The Toddler Module is designed specifically for children who do not consistently use phrase speech. This Module accurately identify toddlers at risk for ASD.

Module 1: for children 31 months and older who do not consistently use phrase speech.

Module 2: for children of any age who use phrase speech but are not verbally fluent.

Module 3: for verbally fluent children and young adolescents.

Module 4: for older verbally fluent adolescents and adults.

In Modules from 1 to 4, algorithm scores are compared with cutoff scores to yield one of three classifications: Autism, Autism Spectrum, and No-spectrum. In the Toddler Module, algorithms yield "ranges of concern" rather than classification scores. For modules from 1 to 4, the Comparison Scores, on a scale from 1 to 10, allow to compare the overall level of symptoms related to the autistic child's spectrum with that shown by individuals diagnosed with Autism Spectrum Disorder of same age and level of language skills. ADOS-2 scores combine symptoms from the Social Affect (SA) and Restricted and Repetitive Behaviors (RRB) domains. The Social Affect (SA) includes the evaluation of aspects related to communication and reciprocal social interaction. In Restricted and Repetitive Behaviors fall unusual sensory interests, mannerisms, repetitive behaviors and interests, and the stereotyped-idiosyncratic use of words and /or vocalizations. To the behaviors of different areas is given a score of increasing severity (0, 1, 2). The cut-off for the ADOS-2 classifications vary according to the module used and to the child's language level.

Cognitive assessment

The Leiter International Performance Scale–Revised (Leiter–R) [47] is a battery of individually, nonverbally administered subtests

Table 1: Sample Charateristics.

	AUT (N = 24)	SpD (N = 10)	RISK (N = 19)	Statistics
Male/female	16/8	9/1	16/3	Chi square = 3.2; p = .20
Age in months (mean, SD) Range in months	40.5 (7.9) 31-61	43.1 (10.8) 32-66	25.6 (1.8) 22-30	F = 28.1; p = .01 AUT and SpD > RISK
IQ scores (mean, SD)	58.2 (14.3)	80.0 (21.3)	78.9 (17.4)	F = 9.9; p = .01 RISK and SpD > AUT
ADOS-2 scores (mean, SD) Toddler Module (N = 19) Module 1 (N = 32) Module 2 (N = 2)	 16.5 (5.4) 17.7 (5.0) 7.5 (0.7)			

AUT: Children with autism; SpD: Children with spectrum disorder; RISK: Children less than 30 months at risk of autism; IQ score: Full-scale intelligence quotient.

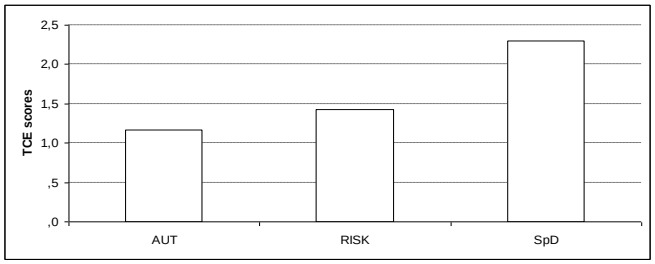

Figure 1: Differences between groups in TCE scores.
AUT: Children with autism; SpD: Children with spectrum disorder; RISK: Children less than 30 months at risk of autism.

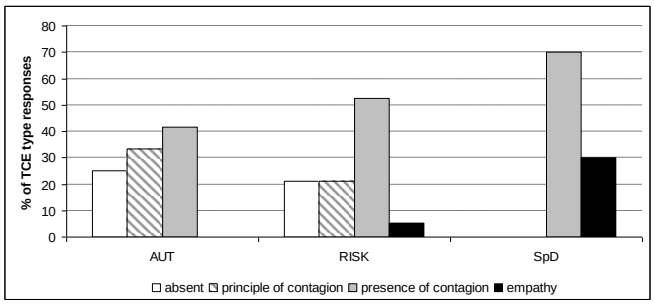

Figure 2: Type of TCE responses showed by the children of AUT, RISK and SpD groups.
AUT: Children with autism; SpD: Children with spectrum disorder; RISK: Children less than 30 months at risk of autism.

designed to assess cognitive functions in children, adolescents and young adults aged 2 years 0 months, to 20 years 11 months. It is widely used to measure nonverbal intelligence by assessing fluid reasoning and visualization, as well as memory and attention. The scale has good evidence of validity from content analysis studies with data from extensive item analyses, from criterion-related studies, from the accuracy of classification of intellectual disabilities, and from various studies related to the construct. The IQ scores had a mean of 100 and a standard deviation of 15. Intellectual disability is indicated by a composite score that deviates two standard deviation or more below the mean, so the score 70 is the borderline value.

Data Analysis

Analyses were using the Statistical Package for Social Sciences (SPSS) version 19. Significance level was set at alpha 0.05 (two-tailed). Chi-squared analyses were conducted to examine group differences in demographic variables between the categorical variables and Multivariate Analysis of Variance (MANOVA) was used to evaluate differences between groups on TCE subscales. Effect sizes were reported as partial eta squared (η_p^2), A η_p^2 of 0.02 was considered a small effect size, 0.13 a medium effect size and 0.23 a large effect size [48]. Correlation analysis was performed to analyze the relationship between emotional contagion, social affection, restricted and repetitive behavior and cognitive development.

Results

Descriptive statistics

Table 1 describes the characteristics of the sample. The three groups were identified according to the ADOS-2 classification. All children under 30 months of age were evaluated with the Toddler Module; 32 children over 30 months of age were assessed with Module 1 and 2 children with Module 2. The three groups did not differ with respect to gender; the AUT and SpD groups did not differ with respect to mean age; the RISK and SpD groups have a similar average IQ score, significantly higher than AUT group.

Differences between subgroups in emotional contagion

The Analysis of the Univariate Variance (ANOVA) revealed no significant effect of variables such as gender (F1,52 = 1.85, P = 0.18), chronological age (F2,52 = 1:37; P = 0.26), cognitive level (F1, 52 = 3.22, P = 0.08), and the presence of problematic siblings (F1,52 = 0.02, P = 0.92) on the emotional contagion capacity. However, the symptom severity measured by the ADOS-2 affected the emotional contagion (F2,52 = 7.12, P <.01, η_p^2 = .22), in fact AUT and RISK groups have shown TCE scores significantly lower than the SpD group (Tuckey test: P <.01) (see Figure 1).

Moreover, as shown in Figure 2, the 25% (6 of 24) of AUT children did not show emotional contagion, the 33% (8 of 24) of them presented a principle of emotional contagion, the 42% (10 of 24) showed the emotional contagion, while no AUT child showed empathy. The 21% (4 of 19) of RISK children showed no emotional contagion, the 21% (4 of 19) of them presented a principle of emotional contagion, the 53% (10 of 19) showed emotional contagion and the 5% showed empathy (1 of 19; specifically, it is a child at Risk 1, who after two years of treatment is out of the ADOS-2 diagnosis of autism). The 70% (7 of 10) of the SPD children showed emotional contagion and the 30% (3 of 10) showed empathy (none of them has absent or principle of emotional contagion).

Differences between groups in the responses to the individual emotions

We also analyzed the frequencies of children who responded or did not respond to the different types of emotions of TCE. We have found that the children of the AUT group were easily more

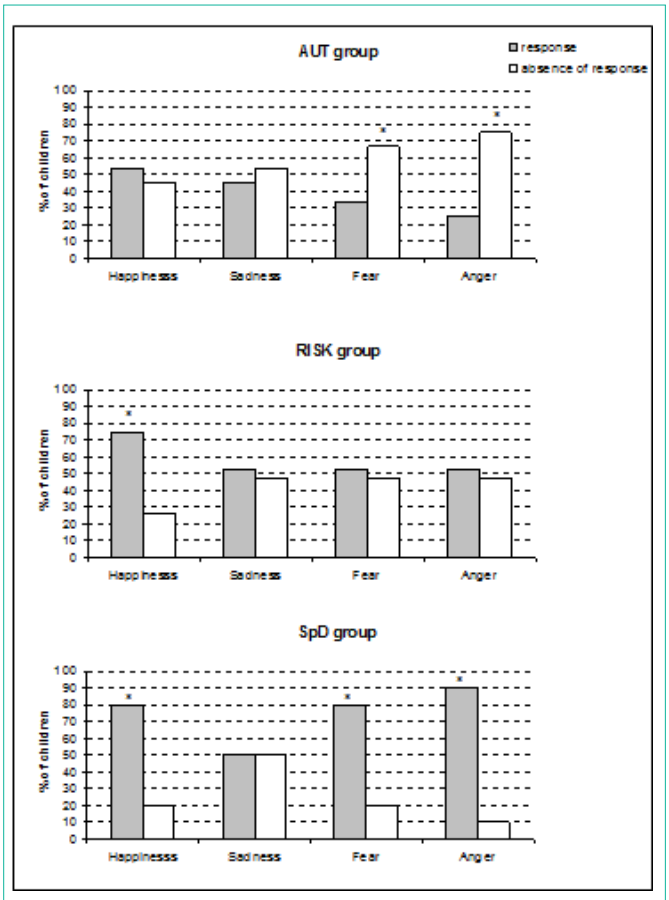

Figure 3: Percentages of AUT, RISK and SpD children showing emotional contagion in TCE. * $P < .01$.

contaminated by emotions of happiness and sadness, and less by fear and anger (Chi-squared = 14.03; $P < .005$). Instead the children of RISK and SpD groups showed no significant differences in responses to different emotions (RISK: Chi-squared = 7.31; $P = .29$; SpD: Chi-squared = 2.86; $P = .24$). In addition, within AUT group, the percentage of children who responded to happiness and sadness was similar to those that do not respond (Happiness: Chi-squared = 2.87; $P = .24$; Sadness: Chi-squared = 0.20; $P = .90$), in fear and anger, the percentage of children who did not show any emotional contagion response was significantly higher than that of children who showed a response Fear: Chi-squared = 6.30; $P < .05$; Anger: Chi-squared = 12.32; $P < .01$) (see figure 3). Even for RISK group happiness is the emotion to which responds the most part of the children, but the types of response are more homogeneous and children respond similarly to all the emotions (see figure 3). Lastly, the children of the SpD group respond with emotional contagion mainly to Happiness, the Fear and Anger (see Figure 3).

Relationship between emotional contagion, Social affection, Restricted and repetitive behavior and IQ

We have found that even the areas of Social Affection, Restricted and Repetitive Behaviors and the Comparison Score measured by the ADOS-2, are negatively correlated to emotional contagion. Instead, the emotional contagion was not related to IQ (see Table 2).

Table 2: Correlation between TCE, ADOS-2 subscales and QI scores.

	SA	RRB	CS	IQ	TCE
ADOS-2 total score	.95**	.70**	.91**	-.36*	-.52**
SA		.43*	.84**	-.28*	-.48**
RRB			.73	-.41*	-.42*
CS				-.39*	-.61**
IQ					.25

TCE: Test for Emotional Contagion; SA: Social Affect impairment; RRBL: Restricted and Repetitive Behaviors; CS: Comparison Score; IQ: Intelligence Quotient. * $P < .01$; ** $P < .001$.

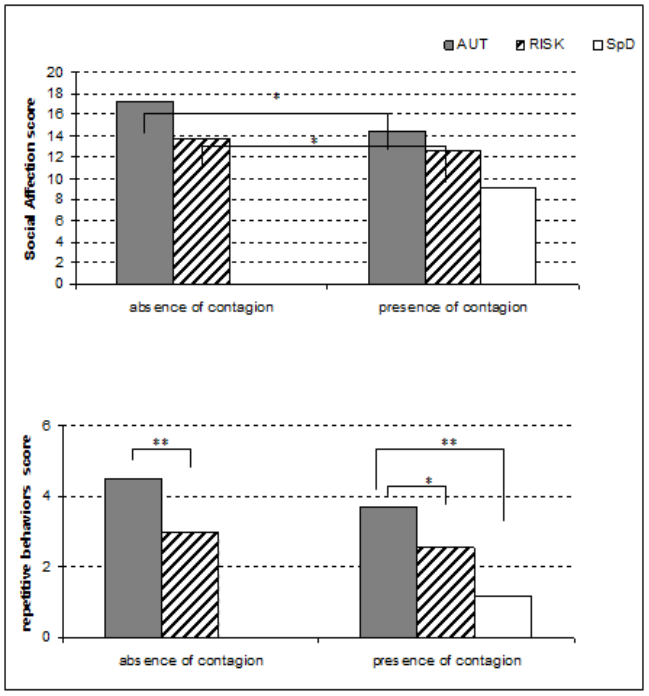

Figure 4: Presence and Absence of emotional contagion and differences between groups on Social Affection and on restricted and repetitive behaviours. * $P < .01$; ** $P < .001$.

Differences in social affection and restricted and repetitive behaviors of children with or without emotional contagion

MANOVA was conducted to evaluate the effect of group variable (AUT *vs* RISK *vs* SpD) and of TCE variable (presence *vs* absence of contagion) on affection and restricted and repetitive behaviors. The children of the AUT and RISK groups without emotional contagion obtained higher scores (indicative of most disorder) than AUT and RISK groups with emotional contagion on Social Affection (Wilks's lambda = 0.58, $P < .01$, $\eta_p^2 = .24$; Tukey test: $P < 0.05$). There were no children in SpD group without emotional contagion. Moreover, the AUT Group showed more restricted and repetitive behaviors than other groups, independently of the presence of emotional contagion (Tukey test: $P < 0.05$). Within the RISK group, children with emotional contagion show similar scores to those without contagion on restricted and repetitive behaviors (Tukey test: $P < 0.05$). Figure 4

Discussion

Regarding the first objective of this research, namely to verify the

effect of the severity of autistic disorder, as measured by the ADOS-2, the presence of emotional response checked by the TCE, the results showed a significant correlation. This means that the severity of the disorder is closely related to the inability of the child to respond to emotional stimuli. Taking into account the three subgroups, the AUT, the RISK, and the SpD in fact show that children of AUT and RISK groups obtained TCE lower scores, compared with the SpD group. Empathy is never present in the AUT group and is present in one child of the RISK group, while it is present in the 30% of children of the SpD group. As for the emotional contagion, it is present in the 42% of children of the AUT group, in the 53% of children RISK group and in 70% of children of the SpD group. These data allow to underline that the SpD group show a differentiated emotional response, as already said, between empathy (30%) and emotional contagion (70%). In a previous study we have shown that the best social and emotional conditions of the children of the SpD group, measured by ADOS-2 sub-scales, supported by a developmental-relational therapy, have brought very significant improvements after only two years of treatment [14]. It will be interesting, in a future research line, to check the predictive value of the presence of emotional contagion for the purposes of therapeutic prognosis. As for the second objective, namely to check whether there is a specific response to each emotion, we found that the emotion that most closely meet children of all groups is happiness. Specifically it highlights the RISK group, including children under the age of 30 months, a period in which the disease has not yet taken shape, a greater response homogeneity, with the present happiness in the 70% of cases and the 3 other emotions present in 51% of cases. In the AUT group, instead, the greater response concerns the happiness (52%), while the minor one regards anger (present in 25%). Sadness and fear were respectively 46% and 32%. In the SpD group, finally, happiness and fear are present in the 80% of the cases, while the sadness standing at 50% to 90% and anger. As regards, finally, the third objective, namely the correlation of emotional response with the level of intelligence and the specific areas evaluated with the ADOS-2 (AS and CRR), no correlations were evidenced between TCE and IQ. Therefore, the emotional response is independent of the cognitive level, while the IQ is correlated to the severity of the autistic disorder measured by the ADOS-2. Regarding the correlation between AS, CRR and TCE, it is interesting to highlight that the AS is directly connected to the emotional response in the SpD group, which is characterized by lower presence of CRR, while in the AUT group the smaller presence of emotional response corresponds to a greater presence of CRR. This finding supports the hypothesis of the emotional imbalance of Smith [15], for which the majority presence of CRR would be the evidence of defensive attitudes. The result of our study confirm that "the activity, cognitive capacities, relationship and emotional well-being of ASD children can be improved by a variety of non verbal, non cognitive activities in which the therapist who engages sensitively with the individuality of their impulses and felt experiences, accompanies the autistic children in the emotions of intimate engagement to more productive and less defensive state of activity and awareness. This type of relational and creative therapy, which responds to and guides the primary actions, interests and feelings of autistic children, much as mother engages her affections with her animated infant from birth, can benefit language and both social and practical education" [49,50]. This consideration is strengthened by the fact that the greatest number of answers regards the emotional stimulus "happiness" in the three groups. In clinical terms, this translates into the need to offer the child motivating and engaging situations in a playful condition and absolutely no stress on the part of caregivers.

Acknowledgement

This article is based on the activities of the Institute of Ortofonologia (IdO) of Rome. We are grateful to the psychologist, speech therapist, parents, and children whose participation made this work possible.

References

1. Geller L. Emotional regulation in autism spectrum disorders. Autism Spectrum Quarterly. 2005;14–17.
2. Jahromi LB, Meek SE, Ober-Reynolds S. Emotion regulation in the context of frustration in children with high functioning autism and their typical peers. J Child Psychol Psychiatry. 2012; 53: 1250-1258.
3. Konstantareas MM, Stewart K. Affect regulation and temperament in children with Autism Spectrum Disorder. J Autism Dev Disord. 2006; 36: 143-154.
4. Laurent AC, Rubin E. Challenges in emotional regulation in Asperger's syndrome and high-functioning autism. Topics in Language Disorders. 2004; 24: 286–297.
5. Losh M, Capps L. Understanding of emotional experience in autism: insights from the personal accounts of high-functioning children with autism. Dev Psychol. 2006; 42: 809-818.
6. Quek LH, Sofronoff K, Sheffield J, White A, Kelly A. Co-occurring anger in young people with Asperger's syndrome. J Clin Psychol. 2012; 68: 1142-1148.
7. Rieffe C, Oosterveld P, Terwogt MM, Mootz S, van Leeuwen E, Stockmann L. Emotion regulation and internalizing symptoms in children with autism spectrum disorders. Autism. 2011; 15: 655-670.
8. Scarpa A, Reyes NM. Improving emotion regulation with CBT in young children with high functioning autism spectrum disorders. A pilot study. Behavioural and Cognitive Psychotherapy. 2011; 39: 495–500.
9. Gallese V. The shared manifold hypothesis: from mirror neurons to empathy. Journal of Consciousness Studies. 2001; 8: 33-50.
10. Gallese V. The roots of empathy: the shared manifold hypothesis and the neural basis of intersubjectivity. Psychopathology. 2003; 36: 171-180.
11. Gallese V. Intentional attunement: A neurophysiological perspective on social cognition and its disruption in autism. Brain Research Cognitive Brain Research. 2006; 1079: 15–24.
12. Di Renzo M, Petrillo M & Bianchi di Castelbianco F. Le potenzialità intellettive nel bambino autistico. The intellectual potential of the autistic child. New perspectives through the interpretation of the Leiter-R scale. Rome.Magi. 2011.
13. Di Renzo M, Bianchi Di Castelbianco F, Petrillo M, Racinaro L, Rea M. Assessment of a long-term developmental relationship-based approach in children with Autism Spectrum Disorder. Psychol Rep. 2015; 117: 26-49.
14. Di Renzo M, Bianchi di Castelbianco F, Vanadia E, Petrillo M, Racinaro L, Rea M. From the Emotional Integration to the Cognitive Construction: The Developmental Approach of Turtle Project in Children with Autism Spectrum Disorder. Autism-Open Access. 2016; 6: 160-169.
15. Smith A. The empathy imbalance hypothesis of autism: A theoretical approach to cognitive and emotional empathy in autistic development. The psychological record. 2009; 59: 489-510.
16. Jung CG. Fondamenti della psicologia analitica. Opere. 1935;15: 1991.
17. Meltzer D. Explorations in autism: a psychoanalytical study. Perthshire, UK: Clunie Press. 1975.
18. Marcelli D. La position autistique. Hypotheses psychopathologiques et ontogenethiques. Psychiatrie Enfant. 1983; 24: 5-55.

19. Samson AC, Hardan AY, Lee IA, Phillips JM, Gross JJ. Maladaptive behaviour in autism spectrum disorder: The role of emotion experience and emotion regulation. Journal of Autism and Developmental Disorders. 2015.

20. Brazelton TB, Greenspan S. The irreducible needs of children: what every child must have to grow, learn and flourish. 2002.

21. Stern D. The interpersonal world of the infant. New York: Basic Books. 1985.

22. Winnicott DW. Maturational processes and the facilitating environment: studies in the theory of emotional development. London, UK: Hogarth Press. 1965.

23. Buhler C. The first year of life. New York: Day. 1930.

24. Hatfield E, Cacioppo J & Rapson RL. Emotional contagion. New York: Cambridge University Press. 1994.

25. Inzani L, Cazzaniga I, Martelli D, Salina PR. Il contagio emotivo: quando le emozioni "passano" tra le persone. ACP – Rivista di Studi Rogersiani. 2004.

26. Meltzoff AN. Infant Imitation After a 1-Week Delay: Long-Term Memory for Novel Acts and Multiple Stimuli. Dev Psychol. 1988; 24: 470-476.

27. Thompson RA. Empathy and emotional understanding the early development of empathy. In Eisenberg, N. & Strayer J. Empathy and its development. Cambridge University Press. 1987.

28. Hadjikhani N, Zürcher NR, Rogier O, Hippolyte L, Lemonnier E, Ruest T, et al. Emotional contagion for pain is intact in autism spectrum disorders. Translational Psychiatry. 2014; 4: 343.

29. Fassino S. Empatia e strategie dell'incoraggiamento nel processo di cambiamento. Rivista di Psicologia Individuale. 2009; 66: 49-63.

30. Trevarthen C, Delafield-Butt JT. Autism as a developmental disorder in intentional movement and affective engagement. Front Integr Neurosci. 2013; 7: 49.

31. Rogers SJ, Hepburn SL, Stackhouse T, Wehner E. Imitation performance in toddlers with autism and those with other developmental disorders. J Child Psychol Psychiatry. 2003; 44: 763-781.

32. Dapretto M, Davies MS, Pfeifer JH, Scott AA, Sigman M, Bookheimer SY, et al. Understanding emotions in others: Mirror neuron dysfunction in children with autism spectrum disorders. Nature Neuroscience. 2006; 9: 28-30.

33. McIntosh DN, Reichmann-Decker A, Winkielman P, Willbarger JL. When the social mirror breaks: deficits in automatic, but not voluntary, mimicry of emotional facial expressions in autism. Developmental Science. 2006; 9: 295-302.

34. Bird G, Leighton J, Press C & Heyes C. Intact automatic imitation of human and robot actions in autism spectrum disorders. Proceedings of Biological Sciences. 2007; 274: 3027–3031.

35. Press C, Richardson D, Bird G. Intact imitation of emotional facial actions in autism spectrum conditions. Neuropsychologia. 2010; 48: 3291-3297.

36. Spengler S, Bird G, Brass M. Hyper imitation of actions is related to reduced understanding\ of other's minds in autism spectrum conditions. Biological Psychiatry. 2010; 68, 1148–1155.

37. Hobson RP, Lee A. Imitation and identification in autism. J Child Psychol Psychiatry. 1999; 40: 649-659.

38. Grecucci A, Brambilla P, Siugzdaite R, Londero D, Fabbro F, Rumiati RI. Emotional resonance deficits in autistic children. J Autism Dev Disord. 2013; 43: 616-628.

39. Gaddini E. On imitation. International journal of psycho-analysis. 1969; 50: 475-484.

40. Di Renzo M, Mazzoni S. Sostenere la relazione genitori-fi glio nell'autismo: l'interpretazione tramite il triangolo di Losanna [Support the parent-child relationship in autism: the interpretation through the Lausanne Trilogue Play]. 2011; Rome: Magi.

41. Hepburn S, Philofsky A, Fidler DJ, Rogers S. Autism symptoms in toddlers with Down syndrome: a descriptive study. J Appl Res Intellect Disabil. 2008; 21: 48-57.

42. Beall PM, Moody EJ, McIntosh DN, Hepburn SL & Reed CL. Rapid facial reactions to emotional facial expressions in typically developing children and children with autism spectrum disorder. Journal of Experimental Child Psychology. 2008; 101: 206–223.

43. Di Renzo M, Stinà M. TCE – Test del Contagio Emotivo. Test of Emotional Contagion. Florence. Hogrefe. 2011.

44. APA, American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders (DSM-V). APA, Washington, DC.

45. Lord C, Rutter M, Di Lavore PC, Risi S, Gotham K, Bishop S. Autism diagnostic observation schedule, second edition. Torrance, CA: Western Psychological Services. 2012.

46. Colombi C, Tancredi R, Persico A, Faggioli R. ADOS-2 – Autism Diagnostic Observation Schedule-Second Edition. Florence: Hogrefe. 2013.

47. Roid GH, Miller LJ. Leiter-R - Leiter International Performance Scale – Revised. O.S.Organizzazioni Speciali, Firenze. 2002.

48. Pierce CA, Block RA, Aguinis H. Cautionary note on reporting eta-squared values from multifactor ANOVA designs. Educational and psychological measurement. 2004; 64: 916-924.

49. Malloch S, Trevarthen C. Communicative Musicality: Exploring the Basis of Human Companionship. Oxford: Oxford University Press. 2009.

50. Stern DN. Forms of vitality: Exploring dynamic experience in psychology, the arts, psychotherapy, and development. Oxford University Press. 2010.

Austin J Autism & Relat Disabil - Volume 2 Issue 2 - 2016
Submit your Manuscript | www.austinpublishinggroup.com

Citation: Di Renzo M, Bianchi Di Castelbianco F, Petrillo M, Racinaro L, Donaera F and Rea M. The Emotional Contagion in Children with Autism Spectrum Disorder. Austin J Autism & Relat Disabil. 2016; 2(2): 1020.