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How to train a child with Autism Spectrum Disorder to write persuasive texts. A case study during the lockdown caused by Covid-19

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ABSTRACT

This study describes a treatment implemented with a 13.7-year-old child with Autism Spectrum Disorder (conventionally, S; IQ: 111) to enhance his capabilities in writing persuasive texts, a particularly challenging task for individuals with ASD without intellectual disability as it involves a set of socio-cognitive abilities in addition to specific writing skills to persuade a reader. The treatment was implemented via Skype during the lockdown caused by COVID-19. The assessment of the texts took place at three moments: baseline 1, baseline 2 after two weeks, and post-test after an 8 session-treatment. Three criteria were used: presence of structural components (topic, reasons, explanations, counter-arguments, ending); elaborateness of the components; amount of mental state terms. The comparison between S' performance and typically developing controls at baseline 1 showed marked differences in favour of the controls in all measures, which mostly disappeared at post-test. The discussion focuses on the interpretation of the improvements.

Keywords: persuasive text writing; Autism Spectrum Disorder; adolescence; perspective-taking; treatment

1. INTRODUCTION

Writing is a complex cognitive activity which demands high-level processes (Hayes & Flower, 1980), in addition to basic components such as fluency in handwriting when transferring sounds into written signs (Berninger & Abbott, 2010). Faced with such a complex communicative task, children with Autism Spectrum Disorder (ASD, henceforth) (Lai et al., 2014), find the writing experience as problematic, although their profiles may be very diversified (Tomlinson & Newman, 2017; Finnegan & Accardo, 2018; Accardo et al., 2020). In a meta-analysis, Finnegan and Accardo (2018) identified six critical components in the writing abilities of individuals with ASD compared to typically developing peers: handwriting length, legibility, size, speed, spelling and structure. Conversely, no difference appeared in sentence construction. Among all text typologies, persuasive text (PT, henceforth) seems to be one of the most difficult due to its structure and underlying communicative intentions (Asaro-Saddler & Bak, 2014).

A PT is generated by a given problematic, which constitutes its topic, that, in turn, triggers an argumentation grounded on reasons, explanations and/or counter-arguments, finally recapitulated in the ending. As the communicative intention underlying a PT is to persuade a reader about the validity of some arguments and overcome all possible counter-arguments, the writer must illustrate his/her position, and provide reasons to defend it. Therefore, the writer must adopt the interlocutor's position but also contrast it by using even stronger arguments, shifting from his/her point of view to the one of the addressee. In addition to specific language abilities, this process calls upon Theory of mind and executive function (Nippold et al., 2005; Zajic & Wilson, 2020).

PTs in adolescents with ASD (Asaro-Saddler & Bak, 2014; Nippold et al., 2005; Brown et al., 2014), may show poverty of ideas, lack of structural components, and weakness in argument and counter-argument integration. Brown and colleagues (2014) have interpreted those low-quality texts on the basis of Flower's distinction between "writer-based text", versus "reader-based text" (Flower, 1979). The latter is so denominated because it takes into account the way the reader may receive the message.

Pennington and Carpenter (2019) and Accardo and colleagues (2020) emphasized the need for enhancing those skills in the population with ASD. To this end, Brown and colleagues (2014) suggested a combination of procedures: a) using graphic organizers; b) teaching how to pass from facts and details to higher-order concepts; c) teaching how to evaluate the strength of each argument in order to organize the whole argumentation; d) giving visual supports to recall all the steps of the writing process; e) encouraging to ask for

feedback from readers. Asaro-Saddler and Saddler (2010), and Asaro-Saddler and Bak (2012) used the Self-Regulated Strategy Development (SRSD) program, created by Graham and Harris (Graham & Harris, 2005; Harris et al., 2008). This program aims at teaching planning, stimulating a flexible use of strategies, and promoting a positive attitude towards writing and also a positive self-image as a writer. Asaro-Saddler and Bak (2012) trained two mnemonics. The first aimed at enhancing general composition abilities in terms of picking (P) ideas, organizing (O) notes, and writing (W) them down (POW) while the second specified the PT components to use when addressing a possible reader: a topic sentence (T), reasons (R), an explanation (E) for the reasons; an ending (E) (TREE). Based on 11 studies on learners with ASD, Asaro-Saddler (2016) showed that students increased the number of written elements, improved their planning ability and the content of their writing when using the self-regulated strategy.

In our study, we implemented a program with a boy, conventionally called "S", with ASD, without intellectual disability but with difficulties in writing PTs. The present study shares some similarities with a previous case study (Melogno et al., 2020), in terms of characteristics of the participant (a 13.2-year-old boy, with ASD without intellectual disability and difficulties in writing PTs), treatment applied, and methodology. In our case, we hypothesized that S would improve his performance at the end of the treatment in text structure, with an increase in reasons and explanations, although some weakness was likely to remain in counter-arguments, given the more complex nature of this type of argumentative ability.

2. METHODS

To evaluate the impact of the treatment implemented with S, we assessed his composition abilities at baseline 1, then two weeks later, at baseline 2, and at post- test, after 8 treatment sessions (90 minutes), twice a week. We also compared S' PTs at baseline 1 and at post-test to the controls' PTs (N = 8; mean age: 13.6 at baseline 1). Informed consent was given by S' parents once they were made aware of the aims and modalities of the treatment, and also by the controls' parents.

2.1 Participants

S was a 13.7-year-old native Italian-speaking boy at the beginning of the treatment, enrolled in grade 8 in a public school. An early diagnosis of ASD at

preschool age was later confirmed some months before the treatment based on the DSM 5 criteria (American Psychiatric Association, 2013) with the Autism diagnostic observation schedule – Second edition (ADOS 2; Lord et al., 2012). In the Adaptive Behavior Assessment – Second edition (ABAS-II; Harrison & Oakland, 2003) battery, administered to parents and teachers, the critical area was socialization while the strongest was conceptualization. S had a total IQ of 111 at the Wechsler Intelligence Scale for Children– Fourth edition (WISC IV; Wechsler, 2003). Indices appear in Table 1. S showed a peak on Matrix Reasoning (weighted score:17), and an adequate score on Similarities (12). Basic language production was fluent and comprehension adequate (Table 1) while pragmatic abilities showed some weakness in "Understanding the implicit meaning". Theory of Mind was under the expected level.

Table 1. S' WISC IV Indices, language abilities (basic and pragmatic) and Theory of Mind

WISC IV: Index	*Standardized score*	
Verbal Comprehension Index	124	
Perceptual Reasoning Index	126	
Working Memory Index	91	
Processing Speed Index	109	
Basic Language Abilities	*Raw score*	*Z score/Standardized score*
Lexical Denomination (BVN 12-18)	84	1.24
Sentence Generation (BVN 12-18)	15	0.39
Comprehension of Instructions (NEPSY II)	33	13
Pragmatic Language Abilities	*Raw score*	*Z score*
Metaphors	13	0.30
Understanding the implicit meaning	8	-1.74
Cartoons	11	0.74
Situations	6	-1.00
Colour Game	11	-0.02
Total PLA	49	-0.46
Theory of Mind	*Raw score*	*Standardized score*
Theory of Mind A+B (NEPSY II)	20	5

Legend: WISC IV Indices. Basic Language Abilities assessed with BVN 12-18 (Gugliotta, Bisiacchi, Cendron, Tressoldi, & Vio, 2009) and NEPSI II (Korkman, Kirk, & Kemp, 2007), Pragmatic Language Abilities assessed with APL Medea (Lorusso, 2007), and Theory of Mind with NEPSY II (Korkman et al., 2007)

Regarding academic abilities, reading performance was adequate on speed (z score: 0.5) and accuracy (60th percentile) and acceptable on comprehension (between the 15th and the 20th percentile) (Cornoldi & Carretti, 2016) while, in writing, S showed difficulties in motoric fluency in a task of speed in writing numbers with words (z score: -2.23) (Tressoldi et al., 2012).

The controls were recruited randomly in a class of the same grade, in the same school as S'. The following criteria were considered for including them: weighted score on Similarities and Matrix Reasoning (WISC IV) ≥ 10; no learning disabilities nor any other type of developmental disorder; comparable socio-cultural background. The controls did not approach PTs in their school curriculum during the treatment period.

2.2 Treatment

Due to the constraints imposed by the lockdown during the Covid-19, the treatment was implemented via Skype. It was decided to involve S' sister, who had better writing skills although younger than S (10.6 year-old, typically developing), during four sessions. It was thought that the frequent disagreements between the two children, as reported by the parents, and their difficulty in facing verbal conflicts could be exploited to better work on arguments and counter-arguments in PT composition.

The treatment was developed in four phases (modeling, joint writing, partially autonomous writing, autonomous writing), and aimed at training the POW and TREE procedures (Asaro-Saddler & Bak, 2012, 2014; Melogno et al., 2020). POW addresses general composition abilities while TREE specifies the necessary structural components to write a PT (see Introduction). We considered a further category, counter-arguments, referred to those arguments that reflect the reader's perspective, which was treated as an extension of the explanations category.

In the first session (modeling), the adult illustrated the general objectives of the activities related to POW and TREE, by analyzing the meaning of the very expression "persuasive text". He explained the child that there are technical means to render a text more or less persuasive and these can be learned. Then the adult illustrated and modeled POW and TREE using a thinking-aloud technique while composing a PT. Once the text was complete, the adult and S identified the TREE components and transferred them into the graphic organizer (Figure 1).
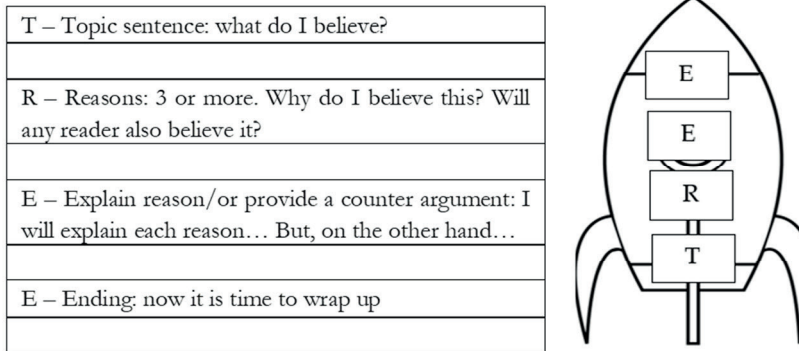
Figure 1. Topic sentence (T), reasons (R), explanations (E) and ending (E) (TREE). Graphic organizer. Adapted from Asaro-Saddler and Bak (2012) with some modifications (left).
Rocket metaphor (right)

At the beginning of the second session (joint writing – first step), the adult asked S to rehearse POW and TREE, and identify the TREE structure in the PTs he had spontaneously produced at baseline 1. Then, S had to complete the graphic organizer (Figure 1) and realized that there always remained some blanks (topic, explanations and ending), which the adult stimulated to fill up. To trigger arguments and counter-arguments, the adult mentioned a hypothetical child with a supposedly different position. "Another child told me a different thing. What do you think, yourself ?". When S agreed with that hypothetical child, his reason was incorporated into the graphic organizer. When S disagreed, he was invited to imagine another plausible reason, which was actually a form of counter-argument. In the end, the TREE structure was completed and visualized in the image of a rocket (Figure 1), itself presented as a metaphor of a PT: if a given component of the text is missing, the text cannot work just as an incomplete rocket cannot take off. Starting from this joint writing phase, the adult offered his help to support S emotionally. This was particularly the case when S omitted something important or seemed to be blocked, or expressed some negative feeling. To contrast negative feelings, the adult proposed self-reinforcing sentences S could retrieve at any time in a written "thought chart".

In the third session (joint writing—second step), for the first time S' sister (conventionally, A) was introduced into the dialogue between the adult and S.

The adult asked S to explain his sister the TREE structure; just after, the adult and the two children composed a PT and brother and sister started to discuss. The adult wrote down all the verbal exchanges and punctually recapitulated the reasons formulated in both agreement and disagreement cases. Due to Skype modality, the adult emphasized his voice modulations to highlight differences and convergencies between the children's opinions. The children were invited to translate their ideas into meaningful sentences and combine them in a text as complete and consistent as possible. They systematically dictated their sentences to the adult asking him to read again what he had written.

In the fourth, fifth and sixth sessions (joint writing – third step), the adult asked S and A to write a PT where each child had to persuade the other to change his/her mind. These PTs were then exchanged and each child could read the other's one. The adult asked: 1) if the other's text had been effective in persuading him/her, and to justify the reason of the effectiveness; 2) if the other's text met the requirements of the rocket; 3) to provide plausible counter-arguments in case of disagreement.

In the seventh session (partially autonomous writing), S was asked to write a PT. At this stage, the adult just pointed out that S could resort to all supports (graphic organizer, rocket, thought chart).

In the eight session (completely autonomous writing), the adult stood beside S, who had all the supports at his disposal, but without any prompt.

2.3 Measures

To analyze the PTs, we used a set of criteria partly drawn from Asaro-Saddler and Bak (2012). Two independent raters, extraneous to the treatment, analyzed the texts based on three criteria: presence of the TREE components, elaborateness of each component; amount of mental state terms.

First criterion. Topic and ending: absence = 0; presence = 1.

Reason and explanation/counter-argument: number of reasons or explanations/counter-arguments provided.

To assess the elaborateness (qualitative level) with which the components were phrased, a 4-point scale was created.

- Reason: Absent or irrelevant reason = 0; Ill-focused reason = 1; Relevant but non exhaustive reason = 2; Exhaustive reason = 3.
- Explanation/counter-argument: No explanation or irrelevant explanation/no counter-argument or irrelevant counter-argument = 0; Ill-focused explanation/ill-focused counter-argument = 1; Relevant but non exhaustive explanation/relevant but non exhaustive counter-argument = 2; Exhaustive explanation/exhaustive counter-argument = 3.
- Topic and ending: No topic nor ending = 0; Topic or ending vaguely

presented or recapitulated = 1; Topic or ending partially presented or recapitulated = 2; Topic or ending presented with an explicit intention to persuade and argue = 3.

To assess mental state terms, two categories of words or expressions had to be identified and counted for each text: epistemic ("I think/I don't think"; "In my opinion") and emotional–volitional ("I like"; "I don't like"; "Too good"). Total score: sum of all the mental state terms.

3. Results

Table 1 reports all the measures regarding S' PTs at all phases, from baseline 1 to the post-test. The number of total TREE components passed from 4 to 17, although the values at baseline 1 and 2 (two weeks after baseline 1 and before treatment) were quantitatively identical. At qualitative level, for Topic, the total value passed from 0 to 2; for Reason, from 2 to 14, with identical values at baseline 1 and 2; for Explanation/Counter-argument, from 3 to 10, with very similar values at baseline 1 and 2 (3 vs 2); for Ending, from 0 to 2. The total number of Mental state terms passed from 6 to 24, with a slight improvement at baseline 2 (8).

Table 2. Scores of the all measures in S' PTs at all phases

	Baseline 1		Baseline 2		Post-test	
	PT1	*PT2*	*PT3*	*PT4*	*PT5*	*PT6*
N. of components						
Topic	0	0	0	0	1	1
Reasons	1	1	1	1	3	4
Expl/C.Arg	0	2	1	1	3	3
Ending	0	0	0	0	1	1
Total PTs	1	3	2	2	8	9
Total Phase	4		4		17	
Levels of components						
Reason 1	1	1	1	1	2	2
Reason 2	0	0	0	0	2	2
Reason 3	0	0	0	0	2	2
Reason 4	0	0	0	0	0	2
Total Reasons	2		2		14	
Expl/C.Arg 1	0	1	1	1	2	2
Expl/C.Arg 2	0	2	0	0	1	2
Expl/C.Arg 3	0	0	0	0	1	2
Total Expl/C.Arg.	3		2		10	
Ending	0	0	0	0	1	1
Total Ending	0		0		2	
N. of Mental terms						
Espist	1	1	2	2	7	5
Em-Vol	2	2	3	1	4	8
Total Epist	2		4		12	
Total Em-Vol	4		4		12	
Total Mental Terms	6		8		24	

Legend: PT: persuasive text; Exp/C.Arg: explanation/counter-argument; Epist: epistemic terms; Em–Vol: emotional–volitional terms; Ment. terms: mental state terms

To compare S' performance (PT1, PT2) at baseline 1 to the controls, we applied Crawford and Howell's method (Crawford & Howell, 1998), used to compare an individual with control samples with modest N (e.g., <10). The statistics of the control sample are then treated as sample statistics rather than population parameters, and the t-distribution (with n — 1 degrees of freedom) is used rather than the standard normal distribution, to evaluate the abnormality of the individual's scores. In this modified t-test procedure, the p-

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value represents the probability of individuals in the population from which the normative sample was drawn of obtaining a score as low as that observed for the individual. The method was applied to all the measures reported in Table 3 and 4. Table 3 reports the results at baseline 1, showing that the controls significantly outperformed S on all measures. When we performed the same type of comparison at post-test on PT5 and PT6 (Table 4), the only significant difference in favour of the controls regarded the Explanation/counter-argument category. Tot (S) = 10; z (S) = -2.22; M(contr.) = 22.88; SD (contr.) = 5.80; t (one-tailed) = -2.094; p < .037. Therefore, while at baseline 1 S' production was poorer than the controls on all measures on both quantitative and qualitative grounds, after the treatment this difference nearly disappeared except for explanations and/or counter-arguments.

Table 3. Comparison between S' and controls' scores at baseline 1 (number of TREE components, levels of the TREE components and number of Mental terms)

Components	S' score *(z score)*	Controls' mean *(SD)*	t	P
Topic PT1	-2.65	-.88 (0.33)	-2.514	0.020
Topic PT2	-	1.00 (0.00)	-	-
Reasons PT1	-5.00	3.50 (0.50)	-4.714	0.001
Reasons PT2	-5.21	4.13 (0.60)	-4.918	0.001
Expl/C.Arg PT1	-3.40	4.50 (1.32)	-3.214	0.007
Expl/C.Arg PT2	-1.56	4.13 (1.36)	-1.477	0.092
Ending PT1	-	1.00 (0.00)	-	-
Ending PT2	-2.65	0.88 (0.33)	-2.514	0.020
Total PTs	-6.67	20.00 (2.40)	-0.6.285	0.000
Levels (PT1, PT2)				
Topic Levels	-2.41	4.00 (1.66)	-2.272	0.029
Reasons Levels	-3.40	17.88 (4.68)	-3.199	0.008
Expl/C.Arg Levels	-3.49	21.63 (5.34)	-3.289	0.007
Ending Levels	-3.26	3.63 (1.11)	-3.083	0.009
Mental Terms (PT1, PT2)				
Epist. Terms	-3.97	11.38 (3.16)	-2.799	0.013
Em-Vol. Terms	-2.68	13.25 (3.46)	-2.760	0.014
Total Ment. Terms	-3.18	24.63 (5.85)	-3.002	0.010

Legend: PT1, PT2: Persuasive text n.1 and n.2; Exp/C.Arg: explanations/counter-arguments; Epist: epistemic terms Em–Vol: emotional–volitional terms; Ment. terms: mental state terms

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Table 4. Comparison between S' and controls' scores at post-test (number of TREE components, levels of the TREE components and number of Mental terms)

Components	S's score (z score)	Control's mean (SD)	t	P
Topic PT5	0.38	0.88 (0.33)	0.343	0.371
Topic PT6	-	1.00 (0.00)	-	-
Reasons PT5	-0.63	3.63 (0.99)	-0.600	0.284
Reasons PT6	0.58	3.50 (0.87)	0.542	0.302
Expl/C.Arg PT5	-1.46	4.63 (1.11)	-1.384	0.104
Expl/C.Arg PT6	-1.12	4.75 (1.56)	-.1.058	0.163
Ending PT5	-	1.00 (0.00)	-	-
Ending PT6	0.38	0.88 (0.33)	0.343	0.341
Total PTs	-1.15	20.25 (2.82)	-1.087	0.157
Levels (PT5, PT6)				
Topic	-1.46	4.13 (1.45)	-1.385	0.104
Reasons	-0.92	17.88 (4.23)	-0.865	0.208
Expl/C.Arg	-2.22	22.88 (5.80)	-2.094	0.037
Endind	-1.09	3.63 (1.49)	-1.031	0.168
Mental Terms (PT5, PT6)				
Epist. Terms	0.31	11.25 (2.38)	0.297	0.388
Em-Vol. Terms	-0.58	14.00 (3.46)	-0.545	0.301
Total Ment. Terms	-0.26	25.25 (4.74)	-0.249	0.405

Legend: PT5, PT6: Persuasive text n.5 and n.6; Exp/C.Arg: explanations/counter-arguments; Epist: epistemic terms Em–Vol: emotional–volitional terms; Ment Terms: mental state terms

In order to evaluate S' personal improvement from his first to his last production, two types of comparisons between S' z scores were calculated at baseline 1 and post-test, using means and standard deviations of the control group. Z scores were calculated on the combined scores of the two PTs in each phase, i.e., PT1 and PT2 for baseline 1 and PT5 and PT6 for the post-test. Data in Figure 2 regard the number of TREE components and Mental state terms, while data in Figure 3 regard the levels of the TREE components.
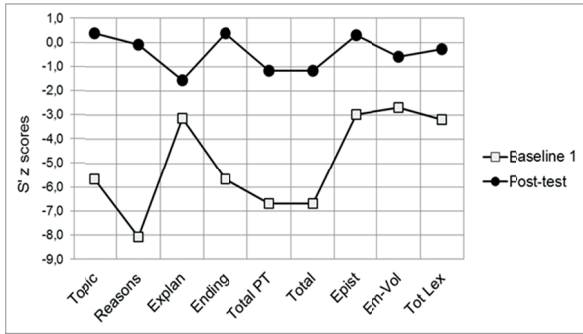
Figure 2. Differences between S' z scores at baseline 1 and post-test on the number of TREE components and Mental state terms
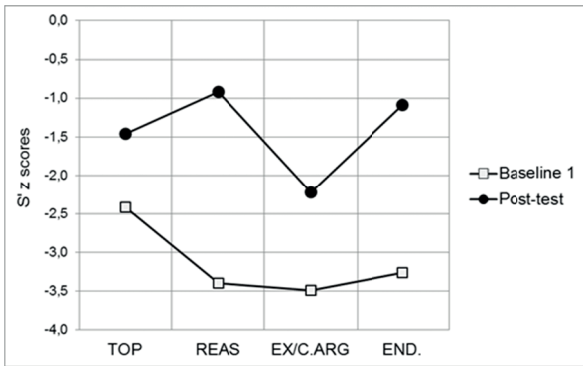

Figure 3. Differences between S' z scores at baseline 1 and post-test on the levels of the TREE components

As z = 1.96 is the critical value for *p* < 0.05 (two-tailed), we considered a more conservative z > 2 difference between post-test and baseline 1 as an index of significant improvement. Figures 2 and 3 show that S improved significantly on all measures except Explanation/counter-argument on quantitative grounds (difference z score = 1.57), and Topic (difference z score = 0.95), and Explanation/Counter-argument (difference z score = 1.27) on qualitative grounds.

4. DISCUSSION

This article describes a treatment conducted via skype to enhance PTs composition in S, a 13.7-year-old child with ASD without intellectual disability, with some weakness in pragmatic abilities and Theory of Mind in spite of adequate basic language abilities The treatment was based on two procedures, POW and TREE, mainly inspired by Asaro-Saddler and Bak (2012) to teach composition skills and the specific structure of a PT (i.e., a text that must convince a reader to change his/her position on a given topic).

S' improvements after the treatment were assessed by comparing his initial to his final production and also his production with a control group at baseline 1 and at post-test. While at baseline 1 there were huge differences in favour of the controls, at post-test only one difference persisted, related to the capability to phrase explanations and/or counter-arguments. This outcome was consistent with what emerged from the comparison between S' initial and final production, where the child significantly improved, except in the number of explanations and/or counter-arguments and in the elaborateness of the topic. We must point out that some differences could still be noted between S' texts and the controls' at post-test. Even when S' PTs were structurally complete and logically coherent, they were more succinct and with less rethorical devices. However, the following excerpt from the last PT, where the direction was to convince the reader about the smartest videogame in the world, well illustrates how precise and well-chained were the explanations S was able to generate at the end of the treatment.

"*Fortnite is the smartest game in the world because it makes you reason on tactics (sic !); when you lose it makes you angry. Being happy for a victory, amazed about new skins, making so many tricks, focusing on something. With Fortnite you can also talk to a friend or a cousin and get fun. Too good, you have to try it !!!!!!!!*". It seems little plausible that such a spontaneous and convincing argumentation can be developed at written level by a child with previous difficulties without a specific treatment.

In addition to the factors foreseen by the program (systematic procedures, graduality, multiple verbal and visual supports), at least two variants of this program might have amplified the expected effects. One is the implementation via skype for a child with S' characteristics, inasmuch as communication through the screen bypassed a specific difficulty of this child in regulating eye contact in face-to-face interaction. At the same time, this type of communication exploited his spontaneous language fluency, a strong point for him. The second variant is the presence of S' sister. It is highly plausible that the opportunity to contradict her triggered a series of arguments and counter-arguments in S' mind. In this way, the presence of A transformed the

"hypothetical child", foreseen in the modeling and the joint writing phase, into a *real* child, who could act as a *real reader*. It is worthy to note that in the above mentioned case study (Melogno et al., 2020) the treatment also proved significantly successful when comparing the participant's (conventional name: G) performance to the controls' in all the measures considered. Nevertheless, there were some differences in S' and G's characteristics, treatment applied and thoroughness of the statistical analyses. S' vocabulary, as measured by the WISC IV, was not as brilliant as G's, and his Theory of Mind was much under the expected level. In addition, in G's case, the treatment was implemented before the lockdown, and therefore did not require the Skype modality, with all the consequences this change had on the nature of the interactions, especially considering the stimulating presence of S' sister in the same home. In addition, G benefited from a minor number of sessions (6 versus 8), with a minor duration, and the comparisons were only implemented between G's and the controls' performance without comparing G's initial and final production, as in S' case. Overall, in spite of the manifest improvements we already commented, S' experience was slightly less successful than G's, which calls for a personalized interpretation of each case study, beyond similarities in participants and treatment programs.

The persisting weakness in S' explanations and counter-arguments at post-test still poses a problem. What we know about S' deficit in Theory of Mind might have negatively affected his capability to articulate sufficiently clear explanations and even to anticipate the reader's counter-arguments. In addition, we cannot exclude that S' poor handwriting fluency substracted attentional resources to higher-order processes involved in argumentation.

We acknowledge that our study has some limitations. For instance, we did not assess the generalizability of the outcomes nor their stability across time, and did not measure the impact of the treatment on adaptive functioning in everyday life (Di Biasi et al., 2016). At the same time, we believe this study opens up interesting prospects. The experience between S, A and the adult we described could inspire new variants of treatments to enhance PT composition in children with ASD. The conflicts that naturally arise between participants could be organized in such a way that an oppositional behavior, that in other contexts might be a negative point, could be exploited to favour argumentative abilities and increase the participants' awareness within the interaction.

REFERENCES

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*, 5th Edition: DSM-5 (5th ed.). Arlington, VA: American Psychiatric Publishing.

Accardo, A. L., Finnegan, E. G., Kuder, S. J., & Bomgardner, E.M. (2020). Writing intervention for individuals with autism spectrum disorder: A research synthesis. *Journal of Autism and Developmental Disorders*, *50*, 1988-2006. https://doi.org/10.1007/s10803-019-03955-9

Asaro-Saddler, K. (2016). Writing instruction and self-regulation for students with autism spectrum disorders: A systematic review of the literature. *Topics in Language Disorders, 36*(3), 266-283. https://doi.org/10.1097/TLD.0000000000000093

Asaro-Saddler, K., & Bak, N. (2012). Teaching children with high-functioning autism spectrum disorders to write persuasive essays. *Topics in Language Disorders, 32*(4), 361-378. https://doi.org/10.1097/tld.0b013e318271813f

Asaro-Saddler, K., & Bak, N. (2014). Persuasive writing and self-regulation training for writers with autism spectrum disorders. *Journal of Special Education, 48*(2), 92-105. https://doi.org/10.1177/0022466912474101

Asaro-Saddler, K., & Saddler, B. (2010). Planning instruction and self-regulation training: effects on writers with autism spectrum disorders. *Exceptional Children, 77*(1), 107-124. https://doi.org/10.1177/001440291007700105

Berninger, V. W., & Abbott, R.D. (2010). Listening comprehension, oral expression, reading comprehension, and written expression: Related yet unique language systems in grades 1, 3, 5 and 7. *Journal of Educational Psychology, 102*(3), 635-651. https://doi.org/10.1037/a0019319

Brown, H.M., Johnson, A. M., Smyth, R. E., & Oram Cardy, J. (2014). Exploring the persuasive writing skills of students with high-functioning autism spectrum disorder. *Research in Autism Spectrum Disorders, 8*(11), 1482–1499. http://doi.org/10.1016/j.rasd.2014.07.017

Cornoldi, C., & Carretti, B. (2016). *Prove MT-3-Clinica. La valutazione delle abilità di lettura e comprensione*. Giunti OS.

Crawford, J. R., & Howell, D. (1998). Comparing an individual's test score against norms derived from small samples. *Clinical Neuropsychology, 12*(4), 482-86. https://doi.org/10.1076/clin.12.4.482.7241

Di Biasi, S., Trimarco, B., D'Ardia, C., Melogno, S., Meledandri, G., & Levi, G. (2016). Psychological adjustement, social responsiveness and parental distress in an Italian sample of siblings of children with high-functioning autism spectrum disorder. *Journal of Child and Family Studies*, 25, 883-890. https://doi.org/10.1007/s10826-015-0256-x

Finnegan, E., & Accardo, A.L. (2018). Written expression in individuals with autism spectrum disorder: A meta-analysis. *Journal of Autism and Developmental Disorders*, *48*(3), 868-882. https://doi.org/10.1007/s10803-017-3385-9

Flower, L. (1979). Writer-based prose: A cognitive basis for problems in writing. *College English*, *41*(1), 19 –37. https://doi.org/10.2307/376357

Graham, S., & Harris, K. (2005). *Writing better*. Brookes Publishing Co.

Gugliotta, M., Bisiacchi, P.S., Cendron, M., Tressoldi, P. E., & Vio, C. (2009). *BVN 12-18. Batteria di valutazione neuropsicologica per l'adolescenza*. Erickson.

Hayes, J.R., & Flower, L.S. (1980). Identifying the organization of writing processes. In L. Gregg & E. Steinberg, (Eds). *Cognitive processes in writing: An interdisciplinary approach* (pp.3-30). Lawrence Erlbaum Associates.

Harris, K., Graham, S., Mason, L. H., & Friedlander, B. (2008). *Powerful writing strategies for all students*. Paul H. Brookes.

Harrison, P. L., & Oakland T. (2003). *Adaptive behavior assessment – Second Edition* (ABAS-II). Harcourt Assessment. (It: Ferri, R., Orsini, A., & Rea, M. ABAS-II. Giunti OS, 2014).

Korkman, M., Kirk, U., & Kemp, S. (2007). *NEPSY- II: A developmental neuropsychological assessment* – Second Edition. The Psychological Corporation; (It: Urgesi, C., Campanella, F., & Fabbro, F. *NEPSY - II.* Giunti OS, 2011).

Lai, M.C., Lombardo, M.V., & Baron-Cohen, S. (2014). Autism. *The Lancet*, *383*(9920), 896–910. https://doi.org/10.1016/S0140-6736(13)61539-1

Lord. C., Rutter, M., DiLavore, P., Risi, S., Luyster, R. J., Gotham, C., Bishop, S. L., & Guthrie W. (2012). *Autism diagnostic observation schedule – Second edition* (ADOS-2). Western Psychological Services; (It: Colombo, C., Tancredi, R., Persico, A. M., & Faggioli, R., *ADOS-2.* Hogrefe, 2013).

Lorusso, M.L. (2007). *Abilità pragmatiche del linguaggio. APL Medea*. Giunti OS.

Melogno. S., Pinto, M.A., Ruzza, A., & Scalisi G. (2020). Improving the Ability to Write Persuasive Texts in a Boy with Autism Spectrum Disorder:

Outcomes of an Intervention. *Brain Sciences, 10*(5), 264. https://doi.org/10.3390/brainsci10050264

Nippold, M. A., Ward-Lonergan, J. M., & Fanning, J. L. (2005). Persuasive writing in children, adolescents, and adults. *Language, Speech, and Hearing Services in Schools*, *36*(1), 125-138. https://doi.org/10.1044/0161-1461(2005/012)

Pennington, R. C., & Carpenter, M. (2019). Teaching written expression to students with autism spectrum disorder and complex communication needs. *Topics Language and Disorders, 39*(2), 191-207. https://doi.org/10.1097/TLD.0000000000000181

Tressoldi, P.E., Cornoldi, C., & Re, A.M. (2012). *Batteria per la valutazione della scrittura e della competenza ortografica 2,* BVSCO-2. Giunti O.S.

Tomlinson, E., & Newman, S. (2017). Valuing writers from a neurodiversity perspective: Integrating new research on autism spectrum disorder into composition pedagogy. *Composition Studies*, *45*(2), 91-112.

Zajic, M. C., & Wilson, S. E. (2020). Writing research involving children with autism spectrum disorder without a co-occurring intellectual disability: A systematic review using a language domains and mediational systems framework. *Research of Autism Spectrum Disorders,* 70, 101471. https://doi.org/10.1016/j.rasd.2019.101471

Wechsler, D. (2003). *Wechsler intelligence scale for children- Fourth Edition (WISC IV).* The Psychological Corporation; (It: Orsini, A., Pezzuti, L., & Picone, L. WISC IV: *Contributo alla taratura italiana*, Giunti OS, 2012).