

REATTACH: A MULTIMODAL INTERVENTION FOR PEOPLE WITH ASD? PART III

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Abstract

Objective: The prevalence of autism spectrum disorders (ASD) is rapidly growing. ASD are characterized by impairments in social interaction and communication and restricted and repetitive interests / behaviors, which has considerable impact on daily life functioning. ReAttach is a multimodal intervention based on attachment, arousal regulation and the change of information-processing and cognitive structures.

We have taken the first steps to explore the benefits of ReAttach for adults and children with Asperger Syndrome, PDD-NOS, and autistic disorder and for people with both autism spectrum disorders and cognitive impairment.

Method: 8 therapists were trained to perform ReAttach with a group of participants (n=58). Comparison of the mean scores on the Autism Treatment Evaluation Checklist (ATEC) before and after 5 therapy sessions was conducted with a paired samples T-test.

Results and Conclusions: In this study, we have explored the potential of 5 sessions of ReAttach to significantly improve the ATEC scores of participants diagnosed with ASD within a short period of time. Further research is required to further investigate this effect, both on long term and in a more controlled setting.

Key words: autism, treatment, sensory processing

Declaration of interest: none

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Introduction

Autism spectrum disorder (ASD) is a group of developmental disabilities characterized by impairments in social interaction and communication and restricted and repetitive interests/behaviors (Baron-Cohen, 1995). These problems in daily life functioning are caused by a variety of difficulties in information processing and developmental challenges that each individual with autism has to face (Weerkamp-Bartholomeus 2013, Baron-Cohen 1995, Volkmar 2011).

ReAttach is an intervention that is constructed to help participants with autism improve their information processing which might help them to overcome problems in daily life functioning themselves. It is a type of psychotherapy based on educational psychological observations, as examining the way in which children process information, emotions, and events can offer substantial insights for child development.

The method is called 'ReAttach' because of the importance of a safe attachment relationship for the development of adaptive emotion regulation skills in children. If children feel stress, anxiety, or discomfort, they will exhibit verbal and/or non-verbal behaviour aiming to obtain comfort from a parent. Such behaviour often induces this attachment figure to provide safety and care, fostering children's ability to learn how to cope with stressful situations. ReAttach focuses on the process in which young children learn how to address their emotions. A child who feels safe is capable of processing new and stressful information through play (Weerkamp-Bartholomeus 2013) and play is extremely important for children's socio-cognitive development.

Play is a way for children to develop self-consciousness, to become aware of the perspective of others and to exercise social cognitive skills to form social concepts. The process of play is complex. ReAttach is designed to reconstruct this process to help participants with autism improve their information processing and to learn them new skills that they did not manage to teach themselves during previous development. ReAttach is thought to comprise the following components: physical contact, arousal regulation, multiple sensory integration processing, conceptual thinking, altering cognitive biases.

In this study, the first steps in exploring the potential of ReAttach for people with ASD will be taken. Patients with autistic disorder, PDD-NOS, Asperger syndrome and ASD & mental disability are offered five sessions of ReAttach, and the extent of their disorder is evaluated before and after with the Autism Treatment Evaluation Checklist (ATEC).

Methods

Study population

A group of 8 therapists was trained by the author to perform ReAttach for autism spectrum disorders. After training of basic skills these therapists provided the ReAttach intervention to people with autism in order to complete their training course and to check their treatment integrity. Each participant was offered five sessions of ReAttach taking place within 12 weeks. The ATEC was filled in prior to and after the five sessions

of ReAttach, in order to evaluate the treatment outcome in terms of extent of problems in daily life functioning. **Figure 1** presents the participants flowchart. In the beginning 63 participants provided informed consent. Exclusion criteria of ReAttach are substance abuse, psychotic features, or crisis. 2 Participants were excluded and after the explanation of the ReAttach procedure 3 participants were not motivated to proceed. The 58 participants that followed through 5 sessions provided both pre- and posttests. Baseline characteristics of the 58 participants can be found in **table 1**.

Figure 1. Participants flowchart

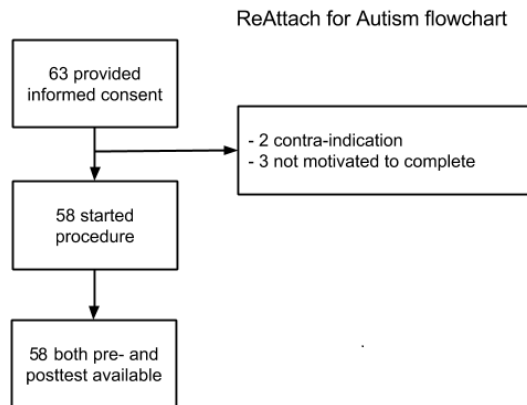


Table 1. Baseline characteristics of the studies population. Data is presented as mean \pm SD

Number of participants	58
Age (years)	24.4 \pm 12.3
Male gender	46 (79.3%)
Diagnosis	100%
- Autistic Disorder	6 (10.3 %)
- PDD-NOS	24 (41.4 %)
- Asperger syndrome	24 (41.4 %)
- ASD and mental disability	4 (6.9 %)

Autism Treatment Evaluation Checklist

The Autism Treatment Evaluation Checklist (ATEC) (Rimland and Edelson 1999) is designed to provide an inventory of problems that people with autism encounter daily. The ATEC consists of four sub-tests: I. Speech/Language Communication (14 items); II. Sociability (20 items); III. Sensory/Cognitive Awareness (18 items); and IV. Health/Physical/Behaviour (25 items). The ATEC was selected because it is specifically designed to assess the effects of treatments for people with autism (Rimland and Edelson 1999). The Autism Research Institute has examined the internal consistency of the ATEC by conducting a split-half reliability test on 1,358 completed ATECs (2007). The internal consistency reliability was high (.94 for the Total Score, .92 for Speech, .84 for Sociability, .88 for Sensory/Cognitive Awareness, and .82 for Health/Physical/Behaviour). Previous studies have shown that the ATEC is a sensitive instrument to measure changes due to a treatment (Jarusiewicz 2002, Lonsdale 2002). In this study, the ATEC was used to assess the general well-being of participants with autism before and after ReAttach. ATEC forms were completed by the therapists, who sampled scores by observing the participants and by questioning the parents or the participants. A paired-sample T-test was conducted

to compare the mean ATEC scores before and after treatment with ReAttach.

Conditions

Prior to performing a ReAttach session, both the therapist and the participant take place at a small table. The therapist explains the procedure, ensuring instructions towards the participant are understood.

ReAttach procedure

In all, 5 individual psycho-therapeutic contacts occur within a period of 3 months, during which the interval between the sessions is increased to stimulate the autonomy of the participant.

The first step of ReAttach: multisensory integration processing and conceptual thinking

The therapist regulates the arousal level of the participant through the therapist's attitude, voice, presence, and attention and through tactile input by tapping the participant's hands (or by engaging in other accepted physical contact). Simultaneously, the therapist stimulates multisensory channels while maintaining an optimal arousal level through verbal prompts, visual exercises, and tactile input (tapping). During this time, the participant's arousal level remains the same, and there is joint attention during the entire therapy session. While multisensory channels are being stimulated, the multisensory integration processing is initiated with the therapist's guidance towards conceptual thinking. Under these optimised conditions, the therapist calls the participant's name to direct the participant towards the 'self-concept'. The participant experiences the initiation of an information search within the brain at such a high speed that it is almost impossible to identify images or words. After this first step, the therapist assists the participant in more challenging social cognitive skills, such as developing theory of mind and social concepts.

The second step of ReAttach: reprocessing information by multisensory integration processing and conceptual thinking

The participant's brain is stimulated to follow through the conceptual thinking assignments. Therefore, this process is still occurring while the therapist begins the second step: cognitive bias modification. The therapist maintains the joint attention and simultaneously stimulates a very low level of arousal. The therapist uses tactile input (i.e., tapping on the hands or body) to reach the arousal level by suddenly changing the tapping speed. The tapping speed is slowed abruptly while tactile stimulation and joint attention continue. The therapist provides verbal prompts without disturbing this arousal level (by adjusting therapist's voice). The participant is then asked to recall detailed information for reprocessing in concepts. The thinking assignments for reprocessing are large (e.g., search all good memories) to help the participant to construct coherent concepts of the self, significant others and the world. After a few thinking assignments, the therapist remains silent. No further instructions are provided, and the joint attention and the ReAttach procedure continue. The participant is focused and involved during the remainder of the session.

Statistics

Comparison of the means of the scores on the ATEC before and after 5 therapy sessions was conducted with a paired samples T-test with a 95% confidence of the interval of the difference CIN (0.95).

Results

A pre- to post-treatment comparison of the average ATEC scores of the total group (n=58) is presented in **table 2**. The results revealed significant decreases ($p<0.001$) in the various developmental areas (I, II, III and IV) and total scores.

Table 3 presents the results of the comparison of the average ATEC scores of the group of participants diagnosed with Autistic Disorder (n=6). This group

shows significant positive changes on the subscales I ($p<0.01$), II, ($p<0.05$), III, ($p<0.05$), IV ($p<0.01$) and on the total score ($p<0.01$).

Table 4 presents pre- to post-treatment comparison of the average ATEC scores of the group diagnosed with Asperger Syndrome (n=24). There are significant positive changes on all ATEC subscales ($p<0.01$) and on the total score ($p<0.01$).

Table 5 presents the results of the pre- post measurements of participants diagnosed with PDD-NOS (n=24). There are significant positive changes on all ATEC subscales ($p<0.01$) and on the total score ($p<0.01$).

Table 6 shows the results of 4 participants diagnosed with ASD & mental disability ($IQ<70$). A significant change ($p<0.01$) is obtained in subscale I. Subscales II and IV do not show reliable changes. Subscale III and the total score reveal significant changes ($p<0.05$).

Table 2. Comparison of mean ATEC scores of the total group

Pre-Post Measurements ATEC Total group (N=58)					
Comparison of Means ATEC (sub)scales	M1, SD1	M2, SD2	M1-M2	t(df)p	ES
I. Speech/Language/Communication	6.28, 3.23	2.41, 2.64	3.86	9.96(57), 0.000	1.31
II. Sociability	22.16, 9.21	7.95, 6.48	14.21	13.72(57), 0.000	1.78
III. Sensory / Cognitive Awareness	16.71, 6.41	7.97, 5.30	8.74	11.91(57), 0.000	1.49
IV. Health / Physical / Behaviour	20.79, 8.64	9.19, 5.99	11.60	11.64(57), 0.000	1.56
Total Score	66.43, 22.37	26.90, 16.28	39.53	15.23(57), 0.000	2.02

Table 3. Comparison of mean ATEC scores of the group diagnosed with Autistic Disorder

Autistic Disorder (N=6)					
Age (M, SD)	18.67, 6.92				
Gender (Male)	100%				
Comparison of Means ATEC (sub)scales	M1, SD1	M2, SD2	M1-M2	t(df)p	ES
I. Speech/Language/Communication	9.83, 0.98	3.33, 3.39	6.50	4.27(5), 0.008	3.93
II. Sociability	27.00, 9.94	8.67, 8.45	18.33	3.84(5), 0.012	1.98
III. Sensory / Cognitive Awareness	20.33, 5.75	8.83, 5.64	11.50	3.97(5), 0.011	2.02
IV. Health / Physical / Behaviour	23.67, 7.34	14.67, 8.59	9.00	5.25(5), 0.003	1.12
Total Score	84.17, 19.02	31.83, 18.67	52.33	4.78(5), 0.005	2.78

Table 4. Comparison of mean ATEC scores of the group diagnosed with Asperger Syndrome

Asperger Syndrome (N=24)					
Age (M, SD)	27.75, 12.88				
Gender (Male)	70.83%				
Comparison of Means ATEC (sub)scales	M1, SD1	M2, SD2	M1-M2	t(df)p	ES
I. Speech/Language/Communication	4.75, 2.83	1.38, 1.84	3.38	6.86(23), 0.000	1.41
II. Sociability	19.79, 8.43	7.29, 5.65	12.50	10.21(23), 0.000	1.74
III. Sensory / Cognitive Awareness	15.79, 5.76	7.67, 4.55	8.13	8.40(23), 0.000	1.57
IV. Health / Physical / Behaviour	21.25, 9.24	8.50, 5.37	12.75	7.69(23), 0.000	1.68
Total score	61.63, 21.57	24.83, 14.80	36.79	10.56(23), 0.000	1.98

Table 5. Comparison of mean ATEC scores of the group diagnosed with PDD-NOS

PDD-NOS (N=24)					
Age (M, SD)	22.17, 11.68				
Gender (Male)	83.33%				
Comparison of Means ATEC (sub)scales	M1, SD1	M2, SD2	M1-M2	t(df)p	ES
I. Speech/Language/Communication	6.50, 3.05	2.54, 2.28	3.96	6.07(23), 0.000	1.47
II. Sociability	21.79, 8.79	7.29, 4.92	14.50	9.36(23), 0.000	2.04
III. Sensory / Cognitive Awareness	15.24, 6.46	6.21, 3.92	9.21	7.31(23), 0.000	1.72
IV. Health / Physical / Behaviour	18.71, 8.55	7.63, 4.61	11.08	7.14(23), 0.000	1.61
Total score	62.75, 21.12	23.54, 12.46	39.21	9.26(23), 0.000	2.26

Table 6. Comparison of mean ATEC scores of the group diagnosed with ASD & mental disability

ASD & Mental Disability (N=4)					
Age (M, SD)	26.75, 16.17				
Gender (Male)	75%				
Comparison of Means ATEC (sub)scales	M1, SD1	M2, SD2	M1-M2	t(df)p	ES
I. Speech/Language/Communication	8.75, 3.30	6.50, 3.79	2.25	9.00(23), 0.003	0.63
II. Sociability	31.75, 10.40	14.75, 13.38	16.50	2.52(3), 0.086	ns
III. Sensory / Cognitive Awareness	24.50, 4.73	19.00, 3.83	5.50	3.22(3), 0.049	1.27
IV. Health / Physical / Behaviour	26.25, 4.57	14.50, 7.33	11.75	2.46(3), 0.090	ns
Total Score	90.75, 14.45	52.00, 23.92	38.75	4.40(3), 0.022	1.96

Discussion

ReAttach was developed from insights within educational psychology related to attachment theory (Bowlby 1969/1997) and information processing theory (Bartholomeus 2013). ReAttach is called a multi-modal approach since the method includes proximity, distance, touch, voice, and emotional expression. For proper execution of ReAttach, the therapist must be sufficiently involved with and sensitive to the participant and must be able to regulate his own arousal and the complexity of behavioural patterns.

Differentiation between diagnoses has shown that people within the whole range of the autism spectrum may benefit. Although the number of participants in this study with both autism and mental disability was low, we are optimistic about working with this group of patients. The ReAttach method does not demand a lot of understanding of spoken language which means that a therapist may easily adjust the verbal prompts at the developmental stage of the patient. This study clearly demonstrates that despite the complexity of the intervention the ReAttach intervention for autism has a good transferability. A group of newly trained professionals was able to obtain positive reliable changes at a broad range of developmental areas as described in the ATEC.

There is no such thing as “the autistic patient”. The participants in this study experience a variation of problems in neuropsychological and daily life functioning. The multi-modality of this intervention offers each participant several chances to learn new skills and to reduce problems in daily life functioning. Many people with ASD have problems with arousal regulation in terms of anxiety problems or attention

deficit (hyperactivity) problems. This might be an obstacle for treatments and it might be difficult to get the autistic participants involved into joint attention. Between 12 and 18 months, a child develops joint attention (Blijd-Hoogewys and Ketelaars 2008) which is considered to be a precursor of theory of mind and the development of language (Verhulst 2008). Interventions such as discrete trial training and pivotal response training have sought to train individuals with autism to engage in joint attention (Stavropoulos, 2013). In these interventions, children are extrinsically reinforced to respond, and they generally show marked improvement in joint attention skills. However, because of the lack of intrinsic social motivation and the use of extrinsic rewards, the joint attention regresses if these rewards are no longer available (Kasari et al. 2010, Landa et al. 2011, Schertz et al. 2013, Whalen and Schreibman 2003).

In ReAttach tapping on the hands is used as a technique to physically and externally regulate the intensity and speed of a participant’s arousal. One of the advances of the tapping is physical contact that stimulates the social reward system in the brain and helps autistic participants to get involved into the joint attention that we need for the social cognitive training. We expect that the physical contact (oxytocin) would be able to provide stress reduction and social reward (Baskerville and Douglas 2010, Gordon et al. 2013). Gordon and his colleagues found that brain centres associated with reward and emotion recognition showed greater responses during social tasks if children received oxytocin than if children received a placebo (Gordon et al. 2013). Oxytocin temporarily normalised brain regions that are responsible for social deficits observed in children with autism. This research suggests that

oxytocin facilitates social attunement and supports our findings that the physical contact during ReAttach might be an explanation for the good joint attention during these therapy sessions.

Another difficulty for people within the autism spectrum is the way information is processed. According to Bogdashina (Bogdashina 2004), concept formation in children with autism is disrupted because they have problems with sensory integration. Because of the disturbed sensory integration process in people with autism, information remains loose and unprocessed (Bogdashina 2004). If people with autism cannot process sensory information as a coherent and meaningful whole (Frith 1989), they will have problems with attention and overall context and meaning. Because of these problems, people with autism are unable to form concepts (Weerkamp-Bartholomeus 2013).

If one assumes that multisensory integration processing can be trained, conceptual thinking in people with autism could be trained. We need to improve their multisensory integration processing, as this ability is required for individuals to form concepts.

The social interaction problems of people with autism arise because of a basic inability to think about mental phenomena as 'self' and 'other' (Baron-Cohen 1995). In his theory of mind hypothesis, Baron-Cohen suggested that individuals with autism are unable to conceptualise other people's beliefs, intentions, desires, and feelings and that they therefore cannot use such knowledge to understand other people's behaviour (Volkmar 2011). A strong relationship exists between theory of mind skills and overall language and cognitive levels. People with autism who have more developed cognitive abilities can usually solve theory of mind tasks quite readily, but they remain severely socially disabled (Dahlgren and Trillingsgaard 1996). Based on the theory proposed by Bogdashina (Bogdashina 2004), one may assume that people with autism store information in a fragmented way in their long-term memory. Therefore, people with autism must reprocess this stored, fragmented information to develop coherent (newly built) concepts. During ReAttach cognitive biases are altered and new information processing skills are trained and automated.

All in all, this study has shown promising results for ReAttach as a possible novel approach to treating people with ASD. A lot of exploration remains to be done, both in terms of effect size in a controlled setting and on the long term, as in the possible mechanisms that may underlie the observed effects.

Conclusions

In this study, we have explored the potential of 5 sessions of ReAttach to significantly improve the ATEC scores of participants diagnosed with ASD within a short period of time. The primary goal of ReAttach is to reduce problems in daily functioning for people with autism. The results of this study confirm hypothesis that this intervention has a positive effect on various developmental areas as described in the ATEC.

The results further suggest that people within the entire range of ASD, can benefit from ReAttach and the method itself might provide important clues to efficient ASD treatment. Moreover, we have demonstrated the transferability of the method.

Future research is nevertheless warranted to corroborate these preliminary results in a randomised, controlled trial and to explore the mechanisms that may underlie these improvements in daily functioning.

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