ReAttach

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**A transdiagnostic intervention for adults and
children with mental health problems**

Paula Bartholomeus

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problems**

If talking no longer helps... ReAttach!

Paula Bartholomeus

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ReAttach

A transdiagnostic intervention for adults and children with
mental health problems

Proefschrift

ter verkrijging van de graad van doctor aan de Universiteit Maastricht, op
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The research presented in this dissertation was performed at the School for Mental Health and Neuroscience, Department of Psychiatry and Psychology of Maastricht University and Stichting ReAttach Therapy International, Hoogeloon.

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Chapter 1

General Introduction

General Introduction

For an educational psychologist, obtaining a Ph.D. in psychiatry is not so common. However, it perfectly fits my desire to optimize the development of the most vulnerable group of people in society: children and adults who are hindered in their development by mental health problems. On February 26th, 2010, I have developed ReAttach from clinical practice and conducted the first ReAttach session on myself. I hoped to create an intervention in which the brain would be in an optimal state for sensory processing and play, with the starting point that playing is processing. My personal experience was that ReAttach quickly induced a subtle but positive change in cognitive biases. Intrigued by this first result, I started practical research to assess and implement ReAttach as a bottom-up intervention for children and adults.

In the same period, within psychiatry, transdiagnostic research and treatment gained increasing attention. The rise of transdiagnostic psychiatry was most appealing to me since I designed ReAttach by following natural developmental processes, ensuring that children can process stimuli, emotions, and events. I assumed that children and adults with mental health problems had not yet mastered or lost these processes. It made sense to help them (re)gain healthy information processing.

This thesis describes the path that ReAttach has taken so far. Telling the underlying transdiagnostic mechanisms played an essential role in the standard protocol and colleagues' training. Transdiagnostic thinking has been so crucial for the theoretical foundation of ReAttach that in the next section, I will start with a reflection on the rise of transdiagnostic psychiatry. The following paragraph provides a framework from which the thesis's studies were initiated to answer the question: is ReAttach a suitable transdiagnostic treatment for adults and children with mental health problems?

Transdiagnostic psychiatry

In psychiatry, transdiagnostic thinking emerged since the beginning of the 21st century by the work of Fairburn et al., who developed a transdiagnostic intervention targeting eating pathology's underlying mechanisms in a single intervention (Fairburn et al., 2003). Around the same period, Barlow et al. created a "unified protocol" addressing core symptomatology across a wide range of emotional disorders (Barlow et al., 2004, 2017; Sauer-Zavala et al., 2020;). They successfully developed an efficient and robust treatment approach from a selected set of psychological procedures. Across psychiatric

disorders, there was an increasing demand for transdiagnostic methods focusing on commonalities rather than differences. Other pioneers were Harvey et al. (2004), who explained the underlying mechanisms of adult psychiatric disorders (Harvey et al., 2004). There came a growing awareness of the high comorbidity rates in adults, children, and adolescents and the importance of the dimensional conceptualizations of psychological distress and multiple-domain outcomes (Garber and Weersing, 2010; Coles et al., 2019; Lai et al., 2019; Rao and Broadbear, 2019; Weibel et al., 2020). Mechanisms with growing evidence as transdiagnostic processes include attention, sensory information-processing, emotion regulation, coping styles, behavioral avoidance, cognitive biases, rumination, and social relations (Chu and Harrison, 2007; Cohen-Louck and Levy, 2020; Compas et al., 2013; Derryberry and Reed, 2002; Eckhardt et al. 2019; Fraire and Ollendick, 2013; Khakpoor et al. 2019; Lim et al., 2020; Meli et al., 2019; Pérez-Fuentes et al., 2020; Pittig et al., 2020; Trasher and Grossman, 2019; Zacharioudakis et al., 2020).

Optimal *physiological arousal* is critical for sustained attention, and more specifically for joint-attention: a requisite for any psychotherapy (Esterman and Rothlein, 2019; Aston-Jones and Cohen, 2005; Unsworth and Robison, 2017). Research has shown that individual arousal states fluctuate enormously and are co-regulated by environmental factors (Corder, 2019; Krueger, 2016; Slaby, 2019). Suboptimal, hyper- or hypo-aroused conditions are associated with low-task engagement and distractibility (Aston-Jones and Cohen, 2005; Unsworth and Robinson, 2017). Derryberry and Reed (2002) found evidence for *attention* as a transdiagnostic factor for mental health problems. They described attentional control as the general capacity to control, focus, or shift attention from positive or negative information (Heitland et al., 2020; Derryberry and Reed, 2002). Sustained attention, the ability to stay focused, is essential for any task performance, including psychotherapy. Attentional control is a prognostic factor for psychotherapeutic treatment outcomes and plays a critical role in affective disorders such as anxiety, depression, and emotional dysregulation (Heitland et al., 2020; Buckman et al., 2019; DeJong et al., 2019; Joormann and Michael Vanderlind, 2014; Koster et al., 2011; Joormann and D'Avanzato, 2010; Eysenck et al., 2007; Gotlib et al., 2004). Reduced establishment of *joint attention* is one of the clinical characteristics of autism spectrum disorders (ASD, Baron-Cohen, 1994; Schilbach et al., 2013; de Jong and Dijkerman, 2019). Furthermore, the ability to engage in joint attention depends on the personal development of the patient. In addition to autism spectrum disorders, emotional neglect or traumatic events

may also play a role in a disturbed or not yet established joint attention. Fraire and Ollendick (2013) found empirical evidence to support *information-processing biases* as a transdiagnostic process underlying anxiety and oppositional defiant disorder. Recent studies suggest that sensory modulation problems are disruptive factors in the processing of stressful events (Christensen et al., 2020; Greenspan et al., 1988; Bundy et al., 2008; Lillas et al., 2018, Pfeiffer et al., 2018, Roberts et al., 2018, Schaaf et al., 2018, Delahooke, 2019, Porges et al., 2019).

Maladaptive schemas (Arntz and Jacob, 2013) and *metacognitive disturbances* (Dimaggio and Lysaker, 2010) have been associated with the core pathology of severe mental health problems. According to Moeller and Goldstein (2014), a metacognitive disturbance is a transdiagnostic process that may underlie severe mental health problems such as personality disorders, addictions, and schizophrenia (Ke and Barlas, 2020; Lysaker et al., 2011). Clinical studies have shown that maladaptive coping strategies, such as cognitive and behavioral avoidance and denial, are correlated with increased impairment across disorders in terms of internalizing and externalizing symptoms, anxiety, depression, and somatic complaints (Compas et al., 2013; Chu and Harrison, 2007). *Rumination*, described by Jacobson et al. (2001) as cognitive avoidance, is a crucial transdiagnostic risk factor. Evidence is found that rumination may be underlying the origination and co-occurrence of multiple internalizing and externalizing problems (McLaughlin & Nolen-Hoeksema, 2011, 2012). Avoidance refers to situations not entering or leaving prematurely a fear-evoking or distressing situation (Ferster, 1973; Jacobson et al., 2001). Avoidance is a maladaptive coping style since it maintains depressive and anxiety symptoms by reducing short-term distress but fails to initiate positive change and often causes additional problems (Jacobson et al., 2001). Stressful life events may affect the regulation processes underlying independent but co-occurring disorders (Compas et al., 2013). *Emotion regulation* seems to be a potential mediating factor of anxiety and depression in adults and children (Khakpoor et al. 2019; Ke and Barlas, 2020; Eckhardt et al. 2019). Individuals who experience *social exclusion* or even feel rejected more likely develop relational, emotional, and academic difficulties, in addition to internalizing problems such as anxiety and depression (La Greca & Landoll, 2011; La Greca & Lopez, 1998; La Greca & Stone, 1993; La Greca & Harrison, 2005). Besides, research suggests that social relations are a maintaining mechanism in externalizing disorders (Miller-Johnson et al., 2002; Frick, 2006). Vinkers et al. (2020) highlight the urgency to enhance *stress-resilience* to reduce the risk

of developing mental health problems in challenging times, such as during the current coronavirus pandemic.

All in all, transdiagnostic approaches have the potential to address multiple coexisting disorders. ReAttach influences physical arousal, multiple sensory processing, mentalization, affect and emotion regulation, cognitive biases, and coping styles. Therefore, we hypothesize that ReAttach might be beneficial for adults and children with mental health problems. We expect that ReAttach will reduce psychological distress symptoms and improve their daily life functioning and stress-resilience.

Is ReAttach a transdiagnostic intervention?

Transdiagnostic treatments aim to treat core symptomatology by targeting an identified set of underlying core processes while using a standard protocol (Ehrenreich-May and Chu, 2013). According to Ehrenreich-May and Chu, transdiagnostic interventions might show superior outcomes, superior generalizability of effects, uniqueness, or efficiency compared to traditional evidence-based treatments. The current thesis aims to investigate the effect of ReAttach as an accessible transdiagnostic intervention on the daily life functioning of children and adults whose development is threatened by mental health problems.

ReAttach is a multimodal intervention (Bartholomeus, 2013) and comprises elements from evidence-based interventions, such as Ayres Sensory Integration (ASI) training (Abelenda and Rodríguez, 2020; Schoen et al., 2019; Schaaf et al., 2018;) Social Cognitive Training (Miley et al., 2019; Haut et al., 2019) Cognitive Bias Modification (Zhang et al., 2019; Kemps et al., 2019; Klein et al., 2018), Mindfulness-Based Cognitive Therapy (Tickell et al., 2020; Sommers-Spijkerman et al., 2018) Compassion-Focused Therapy (Sommers-Spijkerman et al., 2018), and Play (Giacomucci and Marquit, 2020; Chang et al., 2019). There are many similarities with previously mentioned therapies in what ReAttach tries to achieve with the patient. However, ReAttach clearly distinguishes itself by providing the active elements simultaneously and integrated into one fluent therapy session, demanding a multi-tasking therapist. ReAttach aims to changing information-processing biases and automating new adaptive cognitive processes to (re)gain realistic and coherent concepts of the self, (significant) others, and the world. ReAttach achieves this goal by modifying arousal regulation and sensory information processing, social cognitive training, and associative learning. The therapy is accessible since ReAttach is an emotional-neutral experience that does not demand a lot of

understanding of spoken language. A therapist can easily tailor ReAttach by adjusting the instructions to the patient's developmental stage. During ReAttach, the patient quickly changes negative attitudes against the self, significant others, and the world into more adaptive and realistic ones (Bartholomeus, 2013). Assuming that the social environment is an essential part of the patient's developmental climate, ReAttach is used as a systemic intervention (Bartholomeus, 2013).

In short, ReAttach aims to be an accessible, tailored, and systemic intervention based on the activation of healthy development, aiming to help children and adults to become the best possible version of themselves. The following chapters describe the steps from the continuous practice-based research investigating the extent to which ReAttach can meet this objective.

ReAttach: a new schema therapy for adults?

The principle behind ReAttach is the assumption that maladaptive patterns caused by chronic stress or traumatic events may interfere with a patient's daily life functioning. By stimulating a secure attachment relationship and co-regulation of negative affect, a ReAttach therapist (re)enables the patient to process internal and external sensory stimuli into coherent concepts. From the starting point that actions, feelings, and thoughts are highly influenced by previously gained implicit and explicit knowledge (schemas), schema-focused therapy (ST) has been developed for adults with personality disorders (Young, 1994; Young et al., 2003; Farrell et al. 2014; Haeyen, 2019). ST's main goal is to correct maladaptive schemas developed in childhood into more adaptive schemas such as in healthy adults (Artnz and Bögels, 2000; Arntz, 2011, 2012; Arntz and Jacob, 2012; Farrell et al., 2014). ST uses several cognitive-behavioral techniques to first make patients aware of active maladaptive schemas and subsequently replace dysfunctional behavior with more adaptive behavior (Haeyen 2019; Reubsaet, 2018; Farrell et al., 2014; Artnz and Bögels, 2000; Arntz, 2011, 2012; Arntz and Jacob, 2012).

ReAttach and ST share the same goals, namely, to achieve a coherent sense of self and others, improving affective mentalization, learning (pro)active coping styles, and healthy adults' behavior (Artnz and Bögels, 2000; Arntz, 2011, 2012; Arntz and Jacob, 2012). Some of the experiential techniques frequently used within ST are also seen in ReAttach, such as imagery, role-playing, and the multiple chair technique (albeit in a different form). However, ReAttach and ST show essential differences in their theoretical framework, assumptions,

and techniques. ST supports patients in identifying and reappraising cognitions and attributions related to traumatic events and is, therefore, an example of trauma-focused Cognitive Behavior Therapy (Sonis and Cook, 2019; Schnyder et al., 2015; Sin et al., 2015; Sin and Spain, 2016). ReAttach does not focus on trauma, dysfunctional schemas, or maladaptive behavior. The patients experience ReAttach as sensory and social cognitive training while meanwhile, they find it extremely difficult to hold on to thoughts and feelings. The therapist does not revert to traumatic images or traumatic experiences. During ReAttach, the patient receives sensory integration training by simultaneous structured social cognitive training. The highly associative thinking assignments of ReAttach are meant to integrate and conceptualize affect in emotions and are used for active learning (associative memory formation).

ReAttach and ST both use imagination, but the interventions use imagery differently. Schema Therapy involves imagery rescripting to reduce traumatic memories' psychological stress (Arntz and Weertman, 1999; Arntz, 2011; Mancini and Mancini, 2018). The efficacy of imagery rescripting as part of a broader treatment approach has been proven across various psychopathologies (Mancini and Mancini, 2018; Arntz, 2012). Recent findings suggest that imagery rescripting as a stand-alone treatment is also effective (Morina et al., 2017; Mancini and Mancini, 2018). As described in the classic procedure of imagery rescripting (Arntz and Weertman, 1999), the technique starts with imagery exposure and subsequently focuses on rewriting the memory of a traumatic (childhood) event. Exposure-based interventions are strenuous for both patients and therapists (Pittig et al., 2019; Schumacher et al., 2014, 2015). That is why exposure, although effective, may be over-demanding for insecure, anxious therapists and patients (Schare and Wyatt, 2013).

ReAttach is a 'game' where the patient's mind plays from different perspectives without catching up with continuous associative tasks. ReAttach uses imagery for identification and associative learning through reality training (in mind) or by asking the patient to associate new experiences. During these exercises, the therapist's role is to remain silent while regulating arousal and affect. Patients find ReAttach emotionally neutral because the ReAttach therapist does not zoom in on traumatic images or memories. ReAttach sessions do not imply exposure or imagery rescripting. Instead of changing traumatic memories by imagery rescripting, ReAttach neutralizes negative affect by having the patient self-provide new experiences and fill in the emptiness of everything that has been neglected until then. ReAttach gives patients the unique opportunity to

put unrelenting standards into perspective and compassionately develop a more realistic perception of themselves and others. These goals are all embedded in one multimodal ReAttach session.

ST conceptualizes the therapeutic relationship as "limited reparenting," demanding from therapists to create a productive, caring relationship with the patients, just like healthy parents do (Fassbinder et al., 2016; Young et al., 2003). According to Young et al. (2003), the current emotional-cognitive-behavioral state of a patient is referred to as a schema mode: a combination of activated schemas and coping styles. In ST, the therapist's behavior corresponds with the presented schema modes: by supporting and comforting child modes, the contradiction of dysfunctional parent modes, and by reducing dysfunctional coping by offering functional healthier strategies instead (van Wijk-Herbrink et al., 2018; Arntz and Jacob, 2012). ReAttach requires the proximity of the therapist and the patient's trust. As in any psychotherapy, the ReAttach therapist needs to invest in a good working relationship with the patient by informing the patient well and showing professional, trustworthy behavior. As in ST, the ReAttach therapist tailors the therapy session according to the patient's state of mind. However, individual adjustment predominantly aims at the ReAttach "technical" procedure, such as the co-regulation of arousal and sensory stimuli and connection to the patient's current developmental stage. Unlike schema therapy, there is no "limited reparenting" during the ReAttach session. During ReAttach, the therapist is occupied with affect regulation, sensory processing, and social cognitive training in which the patient participates in silence.

From the perspective of the schema-therapeutic framework, ReAttach strengthens the Healthy Adult, and therefore both interventions have the ultimate goal for adults in common. After all, healthy adults should be able to satisfy their basic needs, act autonomously, responsibly, and self-aware in positive connectedness with themselves and others (Claassen and Pol, 2015). From the ST perspective, Arntz and Jacob (2012) state that the ability to conduct an internal Socratic dialogue refers to the presence and growth of the Healthy Adult (Haeyen, 2019). The multiple chair technique used by ST helps start such an internal dialogue (Arntz and Bögels, 2000; Arntz and Jacob, 2012; Claassen and Pol, 2015). ReAttach provokes an internal Socratic dialogue by structured social cognitive training in which patients look at themselves and others from different perspectives under optimized information processing conditions.

In Chapter 2, the effect of ReAttach on adults' maladaptive functioning will be explored through the Young Schema Questionnaire, before and after ReAttach. The question is whether ReAttach can be a brief and accessible modified form of schema therapy for adults who experience severe problems in their social relationships and acceptance of themselves and others.

ReAttach: a new schema therapy for children?

Attachment relationships form the basis for the development of adaptive emotion regulation skills. In the first years of their lives, children need their parents or caregivers to reassure them. (Bowlby, 1973, 1980; Mikulincer, 2019). When a baby is upset, the parent often lifts the child and starts tapping with the fingers at the back of the child to calm it down. To develop a coherent sense of self, we therefore need close encounters with other people. Peekaboo games are played enthusiastically by toddlers who are learning to regulate their arousal. Talsma suggested that excitement is the optimal arousal for sensory integration (Talsma, 2010), which is the precursor of conceptualization, and mentalization (Brummelman, 2017). Bowlby's classic attachment theory relates insecure attachment to psychopathology, with a critical role played by fear. Individuals who experience unsafe attachment have thereby developed an unreliable internal working model of themselves and others. Theoretically, unsafely attached individuals are more vulnerable to mental health problems, particularly anxiety disorders and depression (Bowlby, 1973). Psychological disorders may be regarded as maladaptive emotion regulation strategies. More recent studies found that affective states influence many aspects of the patient's functioning: physical, cognitive, emotional, and behavior (Espeleta, 2019; Schultheis, 2019; Weiss, 2019, 2020). The recent work of Krueger (2016), Corder (2019), and Slaby (2019) further conceptualized negative affect as a combination of unpleasant internal and external sensory stimuli plus arousal. They pointed out that arousal and negative affect (thus affective states) are coregulated by patients and co-actors (individuals who they encounter in their social environment). This coregulation offers unique opportunities for treatment interventions focusing on fostering adaptive affect regulation strategies, such as ReAttach.

Chapter 3 will assess the effect of ReAttach on children's maladaptive functioning in terms of behavioral problems and parent-child relationships. Can ReAttach help children with borderline and clinical scores on the

Children's Behavior Checklist improve their daily life functioning by providing ReAttach to the parents and the child?

ReAttach: a multi-modal intervention for autism spectrum disorders?

Chapter 4 will investigate the impact of ReAttach on the daily life functioning of children and adults with ASD. Because of the pervasive nature of ASD it will be particularly interesting to find out if ReAttach can improve the daily life functioning of individuals with ASD in multiple domains.

Wiring Affect with ReAttach (W.A.R.A.)

In Chapter 5, a brief exercise, built up from essential elements of ReAttach will be assessed, which is part of the therapy for patients with affect regulation problems: W.A.R.A. (Wiring Affect with ReAttach). In a comparative pilot study, the effect of W.A.R.A. versus distraction (shifting the attention away from negative stimuli) on negative affect will be explored. Recent work of Slaby (2019), Corder (2019), and Krueger (2016), describing negative affect as a combination of internal and external sensory stimuli plus arousal, supports the idea that ReAttach and the W.A.R.A. exercise might be successful strategies for the conceptualization of negative affect.

In Chapter 6, the effect on negative affect of W.A.R.A. remote training compared to W.A.R.A. face-to-face by a therapist will be discussed. Is W.A.R.A., provided as a self-regulation tool through remote training successful in reducing negative affect? Is the effect of W.A.R.A. provided face to face by a therapist on negative affect larger, equal or less?

Bolstering stress-resilience

In Chapter 7, we will assess if ReAttach may be useful in bolstering stress-resilience. Besides aiming to reduce psychological distress, empowering patients to become more stress-tolerant is one of the goals of ReAttach. This chapter will focus on the question: Can ReAttach help overcome psychological crises by strengthening resilience?

Discussion

Finally, **Chapter 8** will discuss and integrate the findings of the ReAttach studies to date. At the end of this thesis, it will be argued at which level from practice-based evidence to evidence-based practice, we currently find ourselves, and what recommendations we can formulate for further research.

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Chapter 2

ReAttach a new schema therapy for adults and children? Part I adults: a pilot study

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Abstract

Background: Stress may activate Early Maladaptive Schemas (EMSs) in patients with emotion regulation problems. Schema Therapy (ST) aims to help patients identify active EMSs and replace dysfunctional behavior with adaptive behavior. ReAttach is a transdiagnostic intervention aiming to improve sensory processing, conceptualization and mentalization and change cognitive biases. ReAttach is not specifically designed as a schema therapy, but it might be effective in de-activating EMSs.

Aims: We aimed at exploring if ReAttach effectively reduces active EMSs in adults with stress-related psychological problems.

Methods: We explored the effect of ReAttach on the reduction of EMSs scores, as measured by the Young Schema Questionnaire (YSQ3) in a cohort of 82 help-seeking participants (55 women and 27 men, mean age $44.67 \pm$ SD: 11.62 years).

Results: After ReAttach, we noted a reduction in total YSQ3-scores ($p < .001$, $d = 1.28$), and active EMS-scores with large effect sizes ($p < .001$, d ranging from .83 to 1.47).

Conclusions: These results suggest that ReAttach might reduce YSQ3-scores in adults with stress-related psychological problems in a short time. Independent future research is warranted to corroborate these results in a randomized, controlled trial, with follow up results, and to possibly explore the mechanisms underlying the reduction of active EMS-scores.

Key words: *ReAttach, Schema Therapy. Early Maladaptive Schema, EMS*

1. Introduction

Maladaptive strategies of emotional regulation are characteristic features of psychological disorders (Leahy, 2012). Therefore, the reduction of emotional dysregulation may contribute to the improvement of mental health. A treatment focusing on the reduction of maladaptive emotional regulation strategies may be helpful to a broad range of adults with mental health problems, given that emotional dysregulation has been related to borderline personality disorder, generalized anxiety, post-traumatic stress disorder, substance abuse, rumination, specific phobia, and eating disorders (Barlow et al., 2004; Craske et al., 2008; Fairburn et al., 2003, 2009; Hayes et al., 2011, Leahy et al., 2011; Mennin et al., 2004; Zweig and Leahy, 2011). According to Harvey et al. (2004), emotional disorders often share the same cognitive distortions with

similar information-processing biases. That is why changing information processing and cognitive bias modification may be of interest to patients with mental health problems in general.

The empirically most supported treatment intervention to reduce active Early Maladaptive Schemas (EMSs) in patients with personality disorders is schema therapy (ST) (Taylor et al., 2017; Young, 2003). The ST aims to identify core emotional needs and help individuals find adaptive ways to meet their needs (Rafaeli, Bernstein, & Young, 2011). It can be delivered individually (Giesen-Bloo et al., 2006; Nadort et al., 2009) or through group therapy (Farrell, Shaw, & Webber, 2009; Farrell and Shaw, 2012). EMSs consist of cognitions, emotions, memories, and bodily experiences that form a long-standing cognitive structure of negative beliefs regarding oneself, others, and the world (Taylor et al., 2017; Young, 1990). The ST's primary goal is to correct EMSs into more adaptive schemas such as in healthy adults (Arntz and Bögels, 2000; Arntz, 2011, 2012; Arntz and Jacob, 2012; Farrell et al., 2014). To reach this goal, ST uses cognitive-behavioral techniques to make patients aware of active EMSs and subsequently replace the dysfunctional behaviors with more adaptive ones (Haeyen 2019; Reubsæet, 2018; Farrell et al., 2014; Arntz and Bögels, 2000; Arntz, 2011, 2012; Arntz and Jacob, 2012). The study of Janovsky et al. (2020) reported that EMSs have a moderate positive association with interpersonal problems, with different EMSs showing small to moderate effect sizes. ST is an effective treatment for borderline personality disorder (BPD), as well as other cluster B and cluster C personality disorders (PDs) (Giesen-Bloo et al., 2006). However, Taylor et al. (2017) found that ST's efficacy in reducing EMSs and symptomatology in other mental health disorders was sparse.

Although ST is a valuable and evidence-based treatment for individuals with personality disorders, the method is time-consuming, while requiring a lot of effort from the patients. It might be interesting to consider combining ST with an accessible brief intervention improving the learning conditions and motivation for further treatment.

ReAttach is an accessible brief, transdiagnostic intervention aiming to improve the sensory processing in adults with mental health problems and (re)enable conceptualization and mentalization. Based on the stimulation of a secure attachment relationship, a ReAttach therapist co-regulates arousal and negative affect to optimize social cognitive training and cognitive bias modification under multiple sensory processing conditions (Bartholomeus, 2013; Weerkamp-Bartholomeus, 2020). ReAttach is an exercise for the brain, during which it is challenging to hold on to thoughts and feelings. In contrast to ST,

ReAttach does not focus on trauma, dysfunctional schemas, or maladaptive behavior. Instead, ReAttach focuses on the processing of negative affect and active learning by cognitive bias modification and associative memory formation. Given the existing evidence of the role of information-processing biases in emotional disorders (Harvey et al., 2004), ReAttach might be able to reduce emotional dysregulation.

There is a great deal of overlap of symptomatology and co-morbidity in psychological disorders. Therefore, a transdiagnostic intervention, such as ReAttach, might be of value in lowering active EMSs in a broad range of patient groups. In this pilot study, we explored the hypothesis that ReAttach might reduce active EMS-scores in adults with stress-related psychological problems.

2. Subjects and Methods

2.1 Participants

Nine psychotherapists and three educational psychologists were trained in ReAttach by the first generation of ReAttach trainers. They provided ReAttach to a group of help-seeking participants with stress-related psychological problems (N=132). Data were collected as part of routine clinical care, and all participants consented to data use for research purposes. Therefore, no research ethical committee approval was necessary. We used the Young Schema questionnaire (YSQ3, Dutch version; Young et al., 2003) to assess the total YSQ3 scores and active EMS-scores before and after ReAttach. The YSQ3 is a patient self-report of 232 statements that a participant might use to describe himself and rate on a 6-points rating scale: 1 = completely untrue, 2 = mostly untrue, 3, slightly more true than untrue, 4, moderately true, 5 mostly true, and 6 describes me perfectly. These statements refer to 18 EMSs, representing self-defeating core themes or patterns related to specific emotional needs that were not adequately met in childhood or adolescence (Young, 2012):

1. Abandonment / Instability(AB)

This schema reflects the belief that significant others will not continue to provide emotional support because they are emotionally unstable, unpredictable, or unreliable.

2. Mistrust / Abuse (MA)

This schema is about the belief that others will hurt, abuse, manipulate or take advantage.

3. Emotional Deprivation (ED)

If this schema is activated, the patient expects that others will not meet the desire for nurturance, empathy, or protection.

4. Defectiveness / Shame (DS)

This schema reflects the feeling of being defective, unwanted, inferior, or of being unlovable if exposed.

5. Social Isolation / Alienation (SI)

If activated, this schema reflects the feeling of being different from others or isolated from the rest of the world.

6. Dependence / Incompetence (DI)

Dependence / Incompetence is often presented as helplessness. It is the belief of not being able to handle one's everyday responsibilities without help from others.

7. Vulnerability to Harm of illness (VH)

This schema reflects an exaggerated fear that a catastrophe will strike at any time without being able to prevent it.

8. Enmeshment / Undeveloped Self (EM)

This schema involves excessive emotional involvement and closeness with significant others, hindering individuation and personal growth.

9. Failure to Achieve (FA)

Failure to achieve is about the belief that one will inevitably fail or is fundamentally inadequate.

10. Entitlement / Grandiosity (ET)

If activated, the patient believes to be superior to others and entitled to special rights and privileges.

11. Insufficient Self-control / Self-discipline (IS)

This schema is concerned with the difficulty or refusal to control oneself and tolerate frustrations, emotions, and impulses to achieve personal goals.

12. Subjugation (SB)

Subjugation reflects an excessive surrendering of control to others and usually involves believing that one's desires and feelings are not important to others.

13. Self-Sacrifice (SS)

If self-sacrifice is activated, patients present an excessive focus on voluntarily meeting the needs of others, sometimes leading to a sense that one's own needs are not met.

14. Approval-Seeking / Recognition-Seeking (AS)

Patients with this schema activated present an excessive emphasis on gaining approval of others at the expense of developing a true sense of self.

15. Negativity / Pessimism (NP)

This schema is about a focus on negative aspects of life while simultaneously neglecting positive elements or expectations.

16. Emotional Inhibition (EI)

The activation of the schema emotional inhibition leads to excessive inhibition of spontaneous actions, avoiding disapproval by others, or losing control.

17. Unrelenting Standards / Hyper-criticalness (US)

This schema typically presents the belief that one should strive to meet high internalized standards, usually to avoid criticism. This schema leads to impaired pleasure, relaxation, health, or satisfying relationships.

18. Punitiveness (PU)

If activated, punitiveness presents itself by the belief that making mistakes should be harshly punished. Patients with activated punitiveness tend to be intolerant and impatient with those who do not meet one's standards.

The Dutch YSQ presents adequate stability coefficients and a strong sensitivity in predicting psychopathology's presence or absence (Rijkeboer et al., 2005). We included participants with active EMS-scores. We excluded twenty-six participants without active EMSs, using the cut-off scores per EMS, as Young (2003) advised. Besides, we excluded five participants due to their daily substance abuse. Each participant received five sessions of ReAttach, taking place within three months. The interval between the first and the second session was one week and between the second and the third session, two weeks. The break between the third and fourth session and between the fourth and fifth session was four weeks. Four participants dropped out since they were no longer motivated after the first ReAttach sessions, and three participants dropped out due to personal circumstances. Seven post-tests were missing, and three participants wanted to extend the ReAttach procedure. Therefore, the data from 82 participants were left for analysis.

2.3 Data analysis

We used descriptive statistics to describe the study population's demographic characteristics and a Shapiro-Wilk test to assess normality violations. At baseline, we used OneWay Anova to explore if there were differences in total YSQ3scores between men and women. After ReAttach, we compared the mean differences in total YSQ3-scores of men with the mean differences in total YSQ3scores of women with the Mann-Withey U test. We used the Wilcoxon

Signed Rank Test to compare the mean EMS scores and total YSQ-scores before and after ReAttach. We performed the statistical tests two-sided with a significance level of 5% and reported the interpretation of effect sizes conform Cohen (1992). We carried out all statistical analyses through the Statistical Package for Social Science (SPSS) version 22 (Armonk, NY, USA) (IBM, 2012).

3. Results

3.1 Clinical Characteristics

The data of 82 help-seeking participants (55 women and 27 men, mean age $44.67 \pm \text{SD: } 11.62$ years) were analysed for the present study. As shown in table 1, out of the 82 help-seeking participants 9 reported a clinical diagnosis. All included participants presented psychological stress and maladaptive coping as measured with the YSQ3.

Clinical Diagnoses (N=82)	N	Percent
Autism Spectrum Disorder	1	1.2
Anxiety Disorder	1	1.2
Personality Disorder	1	1.2
Post-Traumatic Stress Disorder	2	2.4
Adjustment Disorder	4	4.9
Clinical diagnoses	9	11.0

Table 1. Clinical diagnoses of the participants of the study (N=82)

3.2. Treatment Evaluation of ReAttach

As shown in figure 1, before ReAttach, the mean total YSQ-score was 627.34. After ReAttach, the mean total YSQ3-score was decreased to 476.60. At baseline (T0), the mean total YSQ3-scores of men (638.33 ± 129.7) were not significantly different from the mean total YSQ3-scores of women (621.95 ± 133.3), ($U = 687.5$, $z = -.543$, $p = .587$). After ReAttach (T1), no significant difference was detected in the reduction of YSQ3-total scores between men (154.59 ± 132) and women (156.71 ± 161.8).

Figure 1. Comparison of mean YSQ3 total scores (N=82) before and after ReAttach. The difference in pre- and post-test is significant ($p<.001$).

Figure 2 shows the comparison of mean EMS-scores before and after ReAttach of the total group of 82 participants. As assessed with the Wilcoxon signed-rank test the differences in pre- and post EMS-scores were all significant ($p<.001$) with large effect sizes (d ranging from .83 to 1.47) (Cohen, 1992).

Figure 2. Comparison of mean EMS scores (N=82) before and after ReAttach.

The differences in pre- and post-test are all significant ($p<.001$).

YSQ3	N	M1	Mdn1	M2	Mdn2	Mdn-diff	Z	p	effect size
ED	82	30.72	31.00	25.83	26.00	- 5.00	-5.220	<.001	0.89
AB	82	43.62	42.50	33.48	31.00	-11.50	-5.859	<.001	1.03
MA	82	43.62	42.50	33.48	31.00	-11.50	-5.859	<.001	1.03
SI	82	28.35	28.00	20.67	19.50	- 8.50	-5.910	<.001	1.04
DI	82	33.77	31.00	24.63	21.00	-10.00	-5.341	<.001	0.91
FA	82	25.39	21.00	15.52	14.00	- 7.00	-6.267	<.001	1.12
EM	82	30.05	28.50	24.35	22.50	- 6.00	-4.086	<.001	0.67
VH	82	25.18	22.00	19.18	17.00	- 5.00	-5.796	<.001	1.01
DS	82	21.59	20.00	16.48	14.00	- 6.00	-5.775	<.001	1.01
SB	82	28.00	26.50	20.80	19.50	- 7.00	-5.382	<.001	0.92
SS	82	61.49	61.50	48.04	48.00	-13.50	-6.474	<.001	1.17
AS	82	45.84	44.00	34.62	33.00	-11.00	-6.420	<.001	1.15
EI	82	24.00	23.50	17.76	16.00	- 6.50	-5.545	<.001	0.95
US	82	48.76	46.00	37.20	36.00	-10.00	-6.463	<.001	1.17
ET	82	28.88	28.50	23.52	22.50	-6.00	-5.545	<.001	0.86
IS	82	37.93	35.50	30.50	29.00	-6.50	-5.098	<.001	0.86
NP	82	29.37	27.50	21.00	20.00	-7.50	-6.154	<.001	1.09
PU	82	40.12	40.00	30.87	29.00	-11.00	-6.158	<.001	1.09
Total	82	627.34	638.00	476.60	471.50	-166.50	-6.921	<.001	1.28

Table 1: Comparison of the mean EMS-scores and YSQ3 total score, before and after ReAttach (N=82).

Active EMS	N	M1	Mdn1	M2	Mdn2	Mdn-diff	z	P	effect size
ED	67	34.31	33.00	28.61	29.00	- 4.00	-5.080	<.001	0.98
AB	72	46.60	46.00	35.30	32.50	-13.50	-5.675	<.001	1.07
MA	78	46.20	44.00	34.40	33.00	-11.00	-5.868	<.001	1.06
SI	65	61.52	64.00	48.92	49.00	-15.00	-5.864	<.001	1.20
DI	52	41.63	38.50	27.27	25.00	-13.50	-5.007	<.001	1.12
FA	53	28.28	26.00	17.38	17.00	- 9.00	-6.000	<.001	1.43
EM	66	33.38	31.00	26.08	24.00	- 7.00	-4.410	<.001	0.83
VH	32	35.91	34.00	23.78	22.50	-11.50	-4.706	<.001	1.45
DS	20	34.95	34.50	23.00	25.50	- 9.00	-3.754	<.001	1.47
SB	64	32.27	32.00	22.08	21.00	-11.00	-5.951	<.001	1.26
SS	82	61.49	61.50	48.04	48.00	-13.50	-6.474	<.001	1.17
AS	80	46.41	45.50	34.86	33.00	-12.50	-6.474	<.001	1.19
EI	59	27.69	27.00	19.07	18.00	- 9.00	-5.701	<.001	1.16
US	78	50.08	47.50	37.97	36.00	-11.50	-6.450	<.001	1.20
ET	70	31.39	31.00	24.70	24.00	-7.00	-5.438	<.001	1.03
IS	67	41.57	39.00	32.31	31.00	-8.00	-5.397	<.001	1.05
NP	64	33.25	32.50	22.67	22.00	-9.50	-6.335	<.001	1.28
PU	75	41.73	41.00	31.36	29.00	-12.00	-6.428	<.001	1.23

Table 2: Comparison of the mean *active* EMS-scores before and after ReAttach.

Discussion

We explored the effect of ReAttach on the reduction of active EMSs in adults with emotional problems reflected in maladaptive coping such as: negativity, self-sacrifice, hyper-criticalness, social isolation, fear of abandonment or failure to achieve. These activated schemas are a barrier to healthy emotional development as in healthy adults. Therefore, reducing activated EMSs helps patients to get back in touch with their basic needs and feelings (Arntz and Jacob, 2012).

The results of our study suggest that ReAttach reduces active EMSs in a short period. Since ReAttach is an accessible and brief intervention that might influence EMSs quickly, it might be interesting to further explore this intervention as a non-invasive, potential first-aid therapy or precursor of ST. ReAttach focuses on changing information-processing biases and automating new adaptive cognitive processes to (re)gain realistic concepts of the self, (significant) others, and the world. It remains unclear whether the EMSs have changed or whether a reduction in the participants' psychological stress has altered the activation of the EMSs. Despite this pilot study's limitations, that we shall discuss below, the results are interesting, especially the evidence of its short latency of efficacy.

Schema therapy is an effective but complicated therapy that requires two to three years (Reubsaet, 2018). Would it be possible to bring about fundamental changes with this much more straightforward and briefer ReAttach technique? In combination with ST, ReAttach might initiate the desired changes or be used for relapse prevention. Although premature, the results of this study are inviting to explore ReAttach and ST's combination, specifically for patients with personality disorders.

Limitations

This pilot study included participants with heterogeneous symptomatology referred to as adults with psychological stress-related problems. Although ReAttach is a transdiagnostic intervention, this group's variability makes it difficult to draw any firm conclusions about the efficacy of ReAttach for specific patient groups. Follow-up data and control groups are lacking. Data about psychotropic medication or simultaneous other treatments during this pilot study, that might be essential confounding variables, were not available. The use of additional psychological assessments besides the YSQ3 would have made this study's design stronger. ReAttach is relatively new and unknown.

The novelty of the intervention and the ReAttach therapists' proximity might have led to curiosity, positive expectations about the treatment outcome and induced a placebo effect. The developer was the researcher and therefore had a conflict of interest. Future research by an independent research team is warranted to corroborate these preliminary results in a randomized, controlled trial and explore the mechanisms underlying EMS-scores' reduction.

Conclusion

The research results suggest that ReAttach effectively reduces active EMS scores in five sessions within 3 months. Nonetheless, independent future research is needed with randomized controlled trials, and homogeneous groups with follow up results to explore the potential of ReAttach for adults with psychological problems.

Disclosure

Paula Bartholomeus is the designer of ReAttach, president of ReAttach Therapy International Foundation, and Director of ReAttach Academy. She received no funding for this study.

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Chapter 3

ReAttach a new transdiagnostic intervention for adults and children? Part II Children

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Abstract

Background: Children's psychological problems are an obstacle to healthy development and must be tackled as soon as possible. Brief, transdiagnostic treatment interventions may reduce children's emotional and behavioral symptoms in a short time, provided they are child friendly. ReAttach is an accessible, brief, systemic intervention aiming to reduce children's psychological distress and maladaptive functioning to optimize healthy developmental conditions.

Aims: We aimed to test the hypothesis that ReAttach reduces emotional and behavioral symptoms of children, as measured with the Child Behavior Checklist (CBCL).

Methods: We used a prospective cohort study to assess the effect of ReAttach on CBCL-scores in eighty-three children (40 girls and 43 boys, mean age $10.37 \pm SD 3.24$ years).

Results: After ReAttach, we found a significant reduction ($p < .001$) of the mean total CBCL score with a large effect size ($d = 1.19$).

Conclusions: These findings suggest that ReAttach effectively reduces emotional and behavioral symptoms of children. ReAttach may be a mild, brief, family intervention decreasing children's psychological and behavioral problems in a short period. Independent future studies with control groups and follow-up results are required to confirm these results.

Keywords: *ReAttach, schema therapy, CBCL, children, family intervention*

I. Introduction

In 2015, seventeen million children and adolescents (nearly 20%) in European Region suffered from a mental, behavioral, developmental, or substance abuse disorder, according to the World Health Organization (WHO, 2018). Available data suggests a close link between mental health problems in childhood and adolescence and psychiatric problems in adulthood, while indicating the importance of promoting and protecting mental health from an early age (Suhrcke, Pillas and Selai 2008, Schmidt et al., 2020).

Meta-analytic findings suggest that longer evidence-based interventions do not necessarily equate to superior clinical outcomes in children's mental health than brief therapy (Stoll et al., 2020; Weisz et al., 2017). For the treatment of specific phobias, one single in vivo exposure treatment session of three hours is a well-established evidence-based brief therapy (Stoll et al., 2020). Other brief interventions for children are found to be probably

efficacious: Cognitive Behavior Therapy (CBT) with social skills training (3 hours), stress inoculation training (8 hours), and CBT-based parent training (6 hours) (Barrett et al., 2001; Bernstein et al., 2005; Collins et al., 2014; Donovan & March, 2014; Morgan et al., 2017; Öst et al., 2001; Pina et al., 2020; Ollendick et al., 2009; Stoll et al., 2020).

Attention Bias Modification Treatment is possibly efficacious in training the attention away from threatening stimuli or training towards positive stimuli across four sessions (Stoll et al., 2020).

A short-term family intervention that addresses parents' psychological stress and the psychological and behavioral problems of children could be of added value. ReAttach is a brief family intervention providing sensory integration training, play, social cognitive training, and active learning to parents and children (Bartholomeus, 2013). ReAttach therapists, working with families, may start with a session for both parents. Parenting a problem-child and dealing with difficult or problematic behavior causes psychological distress, which triggers Early Maladaptive Schemas (EMSs) such as negativity/pessimism, vulnerability, fear of failure, and perhaps even shame (Young 1990; Young et al., 2003). From a systemic perspective, it makes sense to reduce both parents' psychological distress and create the best possible conditions to start the child's therapy. ReAttach invests in an optimal developmental climate for the child by reducing the parents' psychological stress and reducing the activity of the EMSs. Instead, the ReAttach therapist invests in the parent's trust in the parent-child relationship, faith in each other's parenting qualities, and their family's future. Since both parents undergo a ReAttach session themselves, their confidence in the accessible, non-invasive ReAttach therapy also increases. By a positive expectation and confidence in therapy or therapist, parents may cause a placebo effect that enhances the treatment effect. However, a negative parental expectation and lack of confidence in the therapy or the therapist may cause a nocebo effect, negatively influencing the treatment outcome (Rossetтини et al., 2020). Therefore, ReAttach therapists aim to prevent a nocebo effect and instead empower the parents before the child's therapy sessions.

In this study, we investigated the hypothesis that ReAttach reduces children's emotional and behavioral problems as measured with the CBCL.

2. Subjects and Methods

2.1 Participants

Before performing the present study, we trained a group of twenty-one educational therapists to perform ReAttach with children and their parents in their private practices. They provided ReAttach to a group of help-seeking families of children with psychological problems (N=109). Data were collected as part of routine clinical care, and all families consented to data use for research purposes. Therefore, no research ethical committee approval was necessary.

We included children (40 girls and 43 boys, between 6-18 years of age, mean $10.37 \pm SD\ 3.24$) with psychological problems reflected in borderline or clinical scores on the CBCL. We excluded children with CBCL-scores in the normal ranges (N=8), children with an Autism Spectrum Disorder (N=3), and families in crises (such as a divorce) (N=1). At the start, we included ninety-seven families, and eighty-five completed the procedure of five sessions. Twelve families dropped out: three were not motivated to go on after the first session, and three could not follow through due to personal circumstances. Six families were not able to participate at all. Two post-tests were not completed, and therefore the data of 83 families were analyzed. In this cohort, six children had previously been diagnosed with attention-deficit/hyperactivity disorder (ADHD) by a psychiatrist. Each help-seeking family was offered five ReAttach sessions with the child and one session with both parents, taking place within ten weeks. Parents filled out the CBCL questionnaire before and after the five sessions of ReAttach to assess their child's psychological problems. We used a within-subject design to assess the effect of five ReAttach sessions on children's psychological problems.

2.2 Child Behavior Checklist (CBCL)

The Child Behavior Checklist (Achenbach, 2001) measures by 118 items the emotional and behavioral problems of children 6 to 18 years of age. The CBCL is completed by parents. The items are rated with a 3-point Likert-type scale: 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true. Higher scores indicate more severe behavioral and emotional problems. Scores on the CBCL can be used to obtain indices of internalizing problems and externalizing problems. The summed score of all items

represents a total problem score. The psychometric properties of the original version (Achenbach, 2001) and the Dutch version (Verhulst, 1996) are adequate.

2.3 ReAttach

The children and parents who participated in this study received ReAttach sessions conform to the ReAttach protocol from educational psychologists (Bartholomeus, 2013; Weerkamp-Bartholomeus, 2020).

The ReAttach therapists prepared a protocol for the parents in which the child's problems and the parent-child relationship were illuminated. Besides the optimization of information processing in general, the social cognitive training's main focus was to reduce psychological distress and decrease active Early Maladaptive Schemas EMSs in parents. Furthermore, training adaptive coping styles and positive parenting skills were among the active learning options for parents who attended the ReAttach program. ReAttach sessions for adults lasted approximately twenty minutes per session. Each parent received one session in the ten weeks of the study. The ReAttach therapists prepared five tailored sessions for the children. For all children, optimization of arousal, sensory processing, joint attention, conceptualization, and mentalization training was included in each ReAttach session. The cognitive bias modification and active learning modules of ReAttach were tailored to support adaptive emotional and behavioral functioning. In other words, the ReAttach therapists focused on the activation of Early Adaptive Schemas, for instance, of being brave instead of scared. ReAttach sessions for children lasted approximately fifteen minutes per session. Each child received five sessions in ten weeks. The ReAttach therapists started by regulating the participant's arousal level through the therapist's attitude, voice, presence, attention, and tactile input by tapping on the palms of the participant's hands. Simultaneously, the therapists stimulated multisensory channels, using verbal prompts and visual exercises for social cognitive training, cognitive bias modification, and active learning.

2.4 Data analysis

We used descriptive statistics to describe the study population's demographic characteristics. Anova was used to compare the CBCL scores of boys and girls and a Shapiro-Wilk test to assess normality. We used a paired-samples t-test to

compare the mean pre-and post-test scores on the CBCL. We performed the statistical tests two-sided with a significance level of 5% and reported the interpretation of effect sizes conform Cohen (1998). We carried out all statistical analyses through the Statistical Package for Social Science (SPSS) version 22 (Armonk, NY, USA) (IBM, 2012).

3. Results

3.1. Treatment Evaluation of ReAttach

At baseline, we found no significant differences in CBCL-scores between boys and girls $F(1,82) = .318, p = .574$. Figure 2 shows the comparison of mean CBCL total scores before and ReAttach sessions. Before ReAttach, the mean CBCL total score was significantly higher (63.55 ± 7.06) than after the ReAttach sessions (54.12 ± 8.69), ($t(82) = 12.25, p < .001$).

Figure 2. Comparison of mean total CBCL-scores, before and after ReAttach. The difference is significant, $p < .001$.

CBCLscale	N	Age (M,SD)	Male%	M1 ± SD1	M2 ± SD2	M1- M2	t(df)p	ES
Anxious	46	9.72 ± 2.84	47.83	71.39 ± 6.26	59.15 ± 7.09	12.24	12.37(45), 0.000	1.83
Withdrawn	39	9.97 ± 3.13	52.28	70.67 ± 5.44	61.72 ± 8.14	8.95	7.26(38), 0.000	1.29
Somatic	22	10.50 ± 3.19	31.82	70.50 ± 5.69	60.32 ± 7.08	10.18	6.54(21), 0.000	1.59
Social	22	10.77 ± 3.10	59.09	70.00 ± 5.11	62.14 ± 8.06	7.86	5(21), 0.000	1.16
Thought	35	10.34 ± 3.61	42.86	70.43 ± 4.00	60.51 ± 6.91	9.91	9.09(34), 0.000	1.75
Attention	36	10.22 ± 3.31	41.67	70.53 ± 6.22	61.92 ± 7.55	8.61	8.62(35), 0.000	1.25
Rule- Breaking	12	10.25 ± 4.14	42.00	70.17 ± 4.11	58.83 ± 8.07	11.33	7.56(11), 0.000	1.77
Aggression	26	9.35 ± 2.95	42.31	72.92 ± 7.83	62.35 ± 9.64	10.58	5.49(25), 0.000	1.21
Internalizing	65	10.03 ± 3.04	47.69	68.25 ± 4.83	57.49 ± 8.07	10.75	12.14(64), 0.000	1.62
Externalizing	40	9.98 ± 3.48	50.00	66.83 ± 5.84	57.30 ± 8.79	9.53	8.23(39), 0.000	1.28
Total Score	60	10.38 ± 3.33	50.00	66.75 ± 5.14	55.98 ± 8.82	10.77	12(59), 0.000	1.49
DSM Oriented	N	Age (M,SD)	Male	M1 ± SD1	M2 ± SD2	M1- M2	t(df)p	ES
Affective	46	10.15 ± 3.41	50.00	71.28 ± 4.90	61.74 ± 6.82	9.54	12.07(45), 0.000	1.61
Anxiety	45	10.09 ± 3.20	53.33	70.89 ± 3.57	59.09 ± 6.95	11.80	11.80(44), 0.000	2.14
Somatic	16	10.88 ± 3.32	50.00	70.25 ± 6.04	60.56 ± 10.79	9.69	4.41(15), 0.001	1.11
ADHD	27	10.96 ± 3.38	48.15	69.48 ± 4.05	63.11 ± 7.28	6.37	5.13(26), 0.000	1.08
ODP	25	9.28 ± 2.82	40.00	70.24 ± 3.36	60.08 ± 7.96	10.16	7.05(24), 0.000	1.66
CD	18	10.28 ± 4.06	44.44	70.94 ± 6.11	60.56 ± 7.91	10.39	6.80(17), 0.000	1.47
SCT	26	10.15 ± 3.44	50.00	68.88 ± 2.66	61.58 ± 6.48	7.31	6.44(25), 0.000	1.48
OCP	34	10.35 ± 3.07	44.12	74.03 ± 6.59	60.53 ± 7.27	13.50	12.49(33), 0.000	1.95
PTS	47	10.49 ± 3.13	48.94	71.30 ± 5.65	60.17 ± 7.28	11.13	12.11(46), 0.000	1.71

Table 1. Comparison of mean CBCL scores per subscale, of children with borderline or clinical scores, before and after five ReAttach sessions.

Table 1 provides an overview of the number of children with borderline or clinical scores on the subscales of the CBCL. We explored the effect of ReAttach on the different CBCL-subscales by comparing the means with a paired t-test. Table 1 describes the samples and the comparison of mean scores per subscale. We included all subscales to visualize the type of complaints with which help was sought for the children. However, the primary and commonly reported outcome measures of the CBCL are the scores for internalization, externalization, and total problem scores.

Internalizing problems

Out of the eighty-three participants of this pilot study, sixty-five children (34 girls and 31 boys, mean age $10.03 \pm \text{SD } 3.04$ years) presented a clinical or borderline score on Internalizing problems at baseline. Before ReAttach, the mean score on Internalizing problems was significantly higher (68.35 ± 4.83) than after the ReAttach sessions (57.49 ± 8.69) ($t = 12.14$, $p < .001$).

Externalizing problems

Forty children (20 girls and 20 boys, mean age $9.98 \pm \text{SD } 3.48$ years) presented a clinical or borderline score on Externalizing problems at baseline. Before ReAttach, the mean score on Externalizing problems was significantly higher (66.83 ± 5.48) than after the ReAttach sessions (57.30 ± 8.79) ($t = 8.23$, $p < .001$).

Symptom severity

Figure 3 shows the comparison of symptom severity before and after the intervention. After ReAttach, the severity of the problems of the total group of children had decreased. In this pilot study eighty-three children with clinical or borderline scores on the CBCL had participated. After the intervention, thirty-two children were free of complaints and twenty-eight parents reported mild psychological and behavioral problems of their child. The number of children with very severe symptomatology decreased from nineteen before ReAttach to five after the intervention. The number of children with serious problems decreased from ten to two, with significant problems from fourteen to four, and with moderate problems from twenty-four to twelve.

Figure 3. Severity index based on deviation from the cutoff scores and number of children, before and after ReAttach.

4. Discussion

We explored the effect of ReAttach on children's clinical, emotional and behavioral problems by comparing the mean CBCL-scores before and after the intervention. The results suggest that ReAttach significantly reduces CBCL-scores in a short time. After five ReAttach sessions for the child and one ReAttach session for the parents, a significant reduction ($p < .001$) was noted in the mean total CBCL-score compared to before intervention, with a large effect size ($d = 1.19$).

The CBCL scores at pre-test indicate that all 83 children would have been eligible for treatment of very mild to serious psychological complaints. Instead, they turned to an educational psychologist before specialist services. The advantage of treating the symptomatology at a secondary prevention level is that one may quickly intervene. After all, parents reported that after five ReAttach sessions, 32 of the 83 children were free of complaints. In case these sessions continue to have a positive effect on the children's development, fewer children will be referred to specialist services.

Although these results for such a brief and accessible intervention are encouraging, they also raise many questions. The most pressing concern is: What are the underlying mechanisms that have caused this effect? Was it caused by the session for parents, the sessions for the children, or the

combination of both? In case the session for parents was most important, it would be interesting what was measured by the CBCL parents reports. Reflect these results the parents' decrease of EMSs, such as a decrease of negativity and pessimism? Has there been a change in perceived parental stress, perhaps caused by the one-time external regulation of arousal and negative affect? Is the reported decrease in symptom severity a reduction in the children's problems, or could it reflect acceptance, a more optimistic view about the development of the child, or confidence in the parenting style? In the next section, we will further elaborate on the limitations of this study.

5. Limitations

This pilot study has several limitations that future studies should address. Unfortunately, since we have not collected any follow-up results, it remains unclear whether these effects are long-lasting. The heterogeneity of this mainly non-clinical population makes it very difficult to make statements about the effect of ReAttach for specific target groups. We did not separately assess the impact of the parental sessions. If we had worked with two groups, in which one group of parents would have received a ReAttach session and the other group of parents not, we would have gained a better understanding of this critical factor. We did not investigate confounding variables such as socioeconomic status, parental psychological complaints, parents' EMSs, confidence in the therapist, expectations about the therapy, medication, or any other treatment that has taken place in the pilot study period. The lack of a control group is a severe limitation and a missed opportunity to compare ReAttach with another brief therapy for children with mental health problems.

Disclosure

Paula Bartholomeus is the designer of ReAttach, president of ReAttach Therapy International Foundation, and Director of ReAttach Academy. The researchers received no funding for this study.

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Chapter 4

ReAttach a multimodal intervention for ASD? A pilot study

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Abstract

Background: Autism Spectrum Disorders (ASD) are characterized by impairments in social interaction and communication and by restricted and repetitive interests / behaviors impacting everyday functioning. The multimodal ReAttach intervention that focuses on improving stimulus processing and active learning could positively affect the daily functioning of people with autism. In this pilot study, we took the first steps to explore the effect of ReAttach on the everyday functioning of individuals with ASD.

Aims: We aimed to test the hypothesis that ReAttach might reduce problems in everyday functioning of patients with ASD.

Methods: In a prospective cohort study, we assessed the effect of five ReAttach sessions in a group of 58 patients with ASD. The Wilcoxon Signed Rank Test was used to compare the mean pre- and posttest scores on total ATEC-scores and the subscales Speech / Language / Communication, Sociability, Sensory / Cognitive Awareness, and Health / Physical / Behavior.

Results: We found a significant reduction of the total ATEC scores ($p < .001$, $d=1.56$) at the endpoint. Significant decreases were also noted in the subscales Speech / Language / Communication ($p < .001$, $d = 1.33$), Sociability ($p < .001$, $d = 1.52$), Sensory / Cognitive Awareness ($p < .001$, $d = 1.52$), and Health / Physical / Behavior ($p < .001$, $d=1.53$) scores.

Conclusions: The results of this pilot study support the hypothesis that ReAttach could improve everyday functioning of individuals with ASD. Nevertheless, these results have to be interpreted with caution. Independent future studies in more controlled settings with follow-up assessments and specific attention to confounding variables are required to confirm or not the possible benefit of ReAttach for individuals with ASD.

Key words: *ReAttach, ASD, treatment, sensory processing*

Introduction

Autism Spectrum Disorder (ASD) represents a group of developmental disabilities characterized by impairments in social interaction and communication and by restricted and repetitive interests/behaviors. These core symptoms of ASD are present from early childhood, impair or limit everyday functioning, are heterogeneous in terms of complexity and severity, and vary over time (American Psychiatric Association, 2013). The problems in everyday functioning are caused by different difficulties in information processing and developmental challenges that each individual with ASD has

to face (Baron-Cohen, 1995; Bogdashina, 2004; Volkmar, 2011). A fundamental inability to think about mental phenomena as 'self' and 'other' and to mentalization of other people's beliefs, intentions, desires, and feelings has a disruptive effect on the social functioning of individuals with ASD (Baron-Cohen, 1995; Volkmar, 2011).

Bogdashina (2004) proposed that individuals with ASD store sensory information in a fragmented way and experience a fundamental lack of coherence. This lack of coherence has a pervasive impact on development, affecting all developmental domains. That Sensory Modulation Disorders are quite common comorbid conditions in ASD (Christensen et al., 2020; Greenspan et al., 1988; Bundy et al., 2008; Lillas et al., 2018; Pfeiffer et al., 2018; Roberts et al., 2018; Schaaf et al., 2018; Delahooke, 2019; Porges et al., 2019), is highlighted by the emphasis on sensory issues in the new classification of ASD in the DSM-5 (American Psychiatric Association, 2013).

Currently, the empirically most supported treatment interventions for ASD include behavior interventions for babies and young children, such as Discrete Trial Training (DTT) and Early Intensive Behavioral Intervention (EIBI) (Klinger et al., 2020, Steinbrenner et al., 2020). Therapies that integrate Applied Behavior Analysis (ABA) and developmental principles became predominant approaches for treating children with ASD (De Korte et al., 2020; Ona et al., 2019; Ospina et al., 2008).

Pivotal Response Treatment (PRT) is such an approach derived from ABA aiming to target critical areas of impairment in ASD and, therefore, to activate developmental growth in other functioning areas (De Korte et al., 2020 Koegel et al., 2001). The PRT aims to optimize learning opportunities for self-initiations and to provide appropriate levels of help and immediate and contingent reinforcement (De Korte et al., 2020; Koegel & Koegel, 2006, 2019). Joint Attention Symbolic Play Engagement and Regulation (JASPER) (Kasari et al., 2015) and the Early Start Denver Model (ESDM) (Rogers and Dawson, 2010) Joint Attention Symbolic Play Engagement and Regulation (JASPER) (Kasari et al., 2015) and the Early Start Denver Model (ESDM) (Rogers and Dawson, 2010) represent other evidence-based examples of Naturalistic Developmental Behavioral Interventions (NDBIs) combining behavioral and developmental principles (Schreibman et al., 2015) are).

Interventions such as discrete trial training and PRT have sought to train children with ASD to engage in joint attention (Stavropoulos, 2013). In these interventions, the therapist extrinsically reinforces the children 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). A systematic review of Verschuur et al. (2014) reports preliminary evidence that PRT improves self-initiations and speech, language, and social communication skills; daily life functioning.

Although these strategies and behavioral programs produce successful treatment outcomes amongst babies and toddlers, there is still a massive need for therapies improving daily life functioning of older children and adults.

Therefore, it seems interesting to investigate similar interventions for an older population of individuals with ASD. ReAttach is such an intervention, targeting older children from four years of age until late adulthood. ReAttach therapy includes elements of NDBIs such as joint attention, regulation, developmental principles, and play (Bartholomeus, 2013). Besides, ReAttach aims to improve sensory processing and cognitive skills. The ReAttach protocol for ASD is characterized by activating sensory integration, joint attention, conceptualization, imagination, self-reflection, active coping styles, and active learning.

This study was the first to assess the potential benefit of ReAttach for older children and adults with ASD. Children and adults with ASD received five tailored ReAttach sessions. The extent of everyday functioning problems was assessed with the Autism Treatment Evaluation Checklist (ATEC) before and after ReAttach. We hypothesized that ReAttach might significantly improve day-to-day functioning of children and adults with ASD.

2. Subjects and Methods

2.1 Participants

In this pilot cohort study, eight qualified Dutch ReAttach therapists were trained in tailoring ReAttach for individuals with ASD. The therapists were educational or clinical psychologists with a private practice. They provided ReAttach to a group of help-seeking children or adults with ASD (N=63). Data were collected as part of routine clinical care, and all patients or their parents consented for the presence of the supervisor during and to data use for research purposes. Therefore, no research ethical committee approval was necessary.

To observe that the sessions were carried out as trained, the researcher was present during the first ReAttach session. To evaluate the ReAttach sessions, the researcher was also present during the fifth session. Inclusion criteria were a clinical diagnosis of ASD provided by a psychiatrist and the patients needed to be clinically stable. Exclusion criteria were substance abuse and clinical instability. Two adults were excluded due to their daily substance abuse. Therefore, 61 patients with a clinical diagnosis of ASD were included in the pilot study. Three patients dropped out after the explanation of the ReAttach therapy and were not motivated to further participate. In total, 58 patients completed the protocol of five ReAttach sessions. The ATEC forms were completed online by parents, caregivers, or adult patients with help from the therapist. The coded data were sent to the Autism Research Institute (2007) where the ATECs were scored, and the results were sent to the researcher.

A within-subject design was used to analyze the effect of five ReAttach sessions in this group of 58 patients (12 women and 46 men, mean age $24.5 \pm$ SD 13.9 years) on daily life functioning.

2.2 Autism Treatment Evaluation Checklist (ATEC)

The Autism Treatment Evaluation Checklist (ATEC) (Rimland and Edelson, 1999) was used to provide an inventory of problems that individuals with ASD encounter daily. This caregiver-administered survey aims to measure changes in the severity of ASD symptomatology in response to treatment intervention. The ATEC consists of four subscales: I. Speech / Language / Communication (14 items); II. Sociability (20 items); III. Sensory / Cognitive Awareness (18 items); and IV. Health / Physical / Behaviour (25 items). Subscale I, II, and III answers are rated on a 3-points scale not true, somewhat true, very true or not descriptive, somewhat descriptive or very descriptive. Subscale IV answers are rated on a 4-point scale: not a problem, minor problem, moderate problem, serious problem. A summary of the ATEC questions can be found in the appendix. The ATEC is specifically designed to assess the effects of treatments for children with ASD (Rimland and Edelson, 1999). The internal consistency reliability of the ATEC was high (.94 for the Total Score, .92 for Speech / Language / Communication, .84 for Sociability, .88 for Sensory / Cognitive Awareness, and .82 for Health / Physical / Behavior) (Autism Research Institute, 2007). Previous studies have shown that the ATEC is a sensitive

instrument to measure changes due to treatment (Jarusiewicz, 2002; Lonsdale, 2002).

2.3 Data analysis

Descriptive statistics were carried out to describe the demographic characteristics of the study population and a Shapiro-Wilk's test to assess normality violations. To compare the mean pre-and post-test scores on the total ATEC-scores and the ATEC subscales the Wilcoxon Signed Rank Test was used. The statistical tests were performed two-sided with a significance level of 5%. The interpretation of effect sizes was reported conform Cohen (1998). All statistical analyses were carried out through the Statistical Package for Social Science (SPSS) version 22 (Armonk, NY, USA) (IBM, 2012).

3. Results

3.1 Descriptive analysis

Twelve women and forty-six men (mean age $24.5 \pm SD 13.9$ years) with a clinical diagnosis of ASD participated in this pilot study. Four male patients (6.9 %) were diagnosed with co-morbid intellectual disability. The data distribution of the total ATEC scores and the subscale scores of Speech / Language / Communication, Sociability and Health / Physical / Behavior was not normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$). The scores on the subscale Sociability were normally distributed for both males and females ($p > .05$).

3.2. Treatment Evaluation of ReAttach

As shown in figure 1, the baseline mean total ATEC score was 66.43. After five ReAttach sessions, the mean total ATEC score resulted decreased to 27.16. The Wilcoxon signed-rank test detected that there was a significant decrease in the mean total ATEC score (Mdn = -39.00) after ReAttach (Mdn = 25.00) compared to the mean ATEC score before the intervention (Mdn = 65.00), $z = -6.624$, $p < .001$. The effect size was large, $d = 1.56$ (Cohen, 1992). Figure 2 shows the comparison of mean ATEC subscale scores before and after ReAttach sessions. Before ReAttach, the mean score on Speech / Language /

Communication was 5.47. After the ReAttach sessions, the mean score on Speech/Language/Communication was decreased to 2.74. The Wilcoxon signed-rank test revealed a significant decrease in mean score on the subscale Speech / Language / Communication (Mdn = -2.50) after ReAttach (Mdn = 2.00) compared to the mean score on Speech / Language / Communication before the intervention (Mdn = 5.00), $z = -5.965$, $p < .001$. The effect size was large, $d = 1.33$ (Cohen, 1992).

Before ReAttach, the mean score on Sociability was 22.45. After the ReAttach sessions, the mean score on Sociability was decreased to 7.84. The Wilcoxon signed-rank test showed a significant decrease in mean Sociability score (Mdn = -16.00) after ReAttach (Mdn = 7.00) compared to mean Sociability score before the intervention (Mdn = 22.00), $z = -6.513$, $p < .001$. The effect size was large, $d = 1.52$ (Cohen, 1992).

Figure 1. Comparison of mean ATEC total scores (N=58) before and after 5 ReAttach sessions. The difference in pre- and post-test is significant ($p < .001$).

Before ReAttach, the mean score on Sensory / Cognitive Awareness was 16.70. After the ReAttach sessions, the mean score for Sensory / Cognitive Awareness was decreased to 8.43. The Wilcoxon signed-rank test showed a significant decrease in the mean score on Sensory / Cognitive Awareness (Mdn = -8.00) after ReAttach (Mdn = 8.00) compared to mean score on Sensory / Cognitive Awareness before the intervention (Mdn = 16.00), $z = -6.518$, $p < .001$. The effect size was large, $d = 1.52$ (Cohen, 1992).

Figure 2. Comparison of mean scores on the ATEC subscales (N=58) before and after 5 ReAttach sessions. The differences in pre- and post-tests are significant in all subscales ($p<.001$).

The Wilcoxon signed-rank test revealed a significant decrease in mean score on Health / Physical / Behavior (Mdn = -12.00) after ReAttach (Mdn = 7.00) compared to the mean score on Health / Physical / Behavior before the intervention (Mdn = 20.00), $z = -6.569$, $p < .001$. The effect size was large, $d = 1.53$ (Cohen, 1992). At baseline (T0), we found no significant differences between men and women in total ATEC scores ($U = 245$, $z = -.586$, $p = .558$), Speech / Language / Communication scores ($U = 271.5$, $z = -.087$, $p = .931$), Sociability scores ($U = 258$, $z = -.345$, $p = .729$), Sensory / Cognitive Awareness scores ($U = 272$, $z = -0.77$, $p = .939$) or the scores on Health / Physical / Behavior ($U = 199.5$, $z = -1.471$, $p = .141$) as assessed with the Mann-Withey U test. At (T1) we found that women (Mdn 16.00) reported a larger reduction on Health / Physical / Behavior than men (Mdn 11.00). This difference in treatment outcome between men (mean rank = 27.13) and women (mean rank = 38.58), as assessed with the Mann-Withey U test, was small: $U = 167$, $z = -2.095$, $p = .036$, $d = 0.39$.

ATEC - Age	N	M1	Mdn1	M2	Mdn2	Mdn-diff	z	p	effect size
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5 – 60									
Speech	58	5.74	5.00	2.74	2.00	2.50	-5.965	<.001	1.33
Sociability	58	22.45	22.00	7.84	7.00	16.00	-6.513	<.001	1.52
Sensory	58	16.70	16.50	8.43	8.00	8.00	-6.518	<.001	1.52
Health / Behavior	58	21.00	20.00	8.19	7.00	12.00	-6.569	<.001	1.53
Total	58	66.43	65.00	27.16	25.00	39.00	-6.624	<.001	1.56
5 – 12									
Speech	7	8.71	8.00	4.29	2.00	4.00	-2.207	.027	1.46
Sociability	7	27.71	31.00	8.57	9.00	19.00	-2.366	.018	1.63
Sensory	7	18.43	22.00	6.29	8.00	11.00	-2.375	.018	1.64
Health / Behavior	7	26.71	27.00	8.71	8.00	17.00	-2.366	.018	1.63
Total	7	81.57	85.00	27.86	24.00	53.00	-2.366	.018	1.63
13 – 18									
Speech	20	6.35	5.50	3.05	3.50	3.50	-3.674	<.001	1.42
Sociability	20	22.55	21.50	7.05	6.00	16.00	-3.923	<.001	1.58
Sensory	20	17.60	16.00	8.45	8.50	9.50	-3.927	<.001	1.58
Health / Behavior	20	19.20	19.00	6.20	5.50	13.50	-3.827	<.001	1.52
Total	20	66.20	65.00	24.60	25.50	40.50	-3.923	<.001	1.58
18+									
Speech	31	4.68	4.00	2.19	2.00	2.00	-4.190	<.001	1.25
Sociability	31	21.19	21.00	8.19	8.00	13.00	-4.707	<.001	1.49
Sensory	31	15.90	16.00	8.90	8.00	6.00	-4.712	<.001	1.49
Health / Behavior	31	20.87	20.00	9.35	9.00	11.00	-4.863	<.001	1.57
Total	31	63.16	62.00	28.65	25.00	32.00	-4.861	<.001	1.56

Table 1: Comparison of the mean ATEC-scores before and after ReAttach of the total group and the age groups 5-12, 13-18, and 18+ years.

Since the ATEC was initially designed for children between 5 and 12 years of age, we performed a subgroup analysis of different age groups: the range of 5 – 12 years (2 girls and 5 boys, mean age $8.71 \pm SD 1.7$ years), the range of 13 – 18 years (2 girls and 18 boys, mean age $15.80 \pm SD 1.8$ years), and a group of 31 adults (8 women and 23 men, mean age $33.58 \pm SD 13.11$ years).

Table 1 presents the results of the comparison of mean ATEC scores on the age groups. At baseline, the score on Health / Physical / Behavior of children in the age of 5 -12 was significantly higher than the score of children in the age of 13 – 18 years ($U = 24.5$, $z = -1.982$, $p = .048$, $d = .063$) but we found no difference with the adult group. After ReAttach, we found that the youngest children (age 5 – 12 years) reported a better treatment outcome measured in total ATEC-scores than the adults (18+) ($U = 62.00$, $z = -2.106$, $p = .035$, $d = .47$).

Discussion

ASD is a pervasive developmental disorder, impacting every aspects of daily life throughout the lifespan. Despite the availability of early intervention and lifelong support from autism caregivers, this condition remains a challenge for children and adults. This pilot study examined if ReAttach might help to improve the everyday functioning of children (age > 5) and adults with ASD. Klinger et al. (2020) suggest that early, intensive, long-lasting interventions with parents' involvement may yield the best outcomes for individuals with ASD. Towle et al. (2020) questioned the corollary consensus that treatment to improve everyday functioning should start as early as possible (Warren et al., 2011; Reichow et al., 2014; Estes et al., 2015). Although it is evident that babies' to 3-year-olds' neuroplasticity offers unique opportunities for treatment (Towle, 2020; Kolb and Gibb, 2011), there is still scarce evidence for the assumption that after the 3rd year, the opportunities for ASD treatment are less favorable. In adulthood, patients with ASD with comorbid anxiety disorders can benefit from interventions such as Cognitive Behavioral Therapy (CBT) (Klinger et al., 2020; Weston et al., 2016). Older children and adults may benefit from psychoeducation in learning how to deal with their daily functioning problems and how to access all kinds of support. Furthermore, Green et al. (2015) suggest that minimizing exposure to multiple sensory modulations might help individuals with ASD deal with sensory over-responsivity. This advice is in line with a vast amount of research, indicating that at least 56% to 70% of individuals with ASD show severe negative

responses to sensory stimuli, including adversity towards being touched (Podoly and Ben-Sasson, 2020; Ben-Sasson et al., 2019; Ismael et al., 2018; Little et al., 2018; Clince et al., 2016; Al-Heizan et al., 2015; Green et al., 2015; Crane et al., 2009; Liss et al., 2006).

ReAttach focuses on improving stimulus processing and facilitates general learning conditions for self-regulation. In contrast to the sensory diet suggested above, ReAttach starts with the co-regulation of arousal and affect and ensures the predictability of multiple sensory stimulations. In optimal physical arousal and joint attention, ReAttach therapists simultaneously activate multiple senses and trigger the transition from the pre-conceptual state of mind to the conceptual state of mind by demanding conceptualization and by training mentalization.

We explored the effect of ReAttach on the general daily life functioning of individuals with ASD. Therefore, we examined the ATEC total scores and the subscales' scores before and after ReAttach in a group of 58 patients with ASD. Although the ATEC is intended to assess children aged 5 - 12 years, autism-specific problems with language, social communication, sensory, cognitive awareness, and self-regulation persist even into adulthood (American Psychiatric Association, 2013). Although the use of the ATEC of older children and adults might be questionable, the parents, partners and patients could identify with the questions. All items were scored as present problems or issues that although previously present, currently no longer exist. Thus, the ATEC provided us with an insight in the daily life problems of this heterogeneous group of patients with ASD. The study results suggest that ReAttach might be beneficial for older children (age 5+) and adults with ASD. In five ReAttach sessions, the total ATEC-scores as well as the scores on the various subscales significantly decreased, which suggests a positive effect on daily life functioning for individuals with ASD.

ReAttach meets the criteria for a very brief therapy (one to five sessions) which might be helpful to assist help-seeking individuals with ASD in a short time. Besides, ReAttach might reinforce other treatments such as speech therapy, social skills training, and physical training programs. First of all, independent, further research in more controlled settings and follow up results, is required to assess whether ReAttach can meet an evidence-based intervention's expectations.

Limitations

It is plausible that the confidence and enthusiasm of the ReAttach therapists provoked a positive expectation about the intervention's outcome, which might have induced a placebo effect. During the first and fifth ReAttach session, the researcher's presence might have influenced the patients, parents, and therapists. Patients with ASD frequently present co-occurring neurological, psychiatric, and medical disorders that we should have taken into account. Unfortunately, we did not collect data on confounding variables such as comorbid symptomatology and socioeconomic status. Since ASD is a highly heterogeneous disorder, this relatively small number of patients might have skewed the data. Longer clinical trials with a larger sample size and follow-up data would have provided a better study design. We did not collect data about psychotropic medication or simultaneous other treatments that are quite common in patients with ASD.

We used the ATEC, initially designed for children ages 5 - 12, for older children and adults. The appropriate use of this questionnaire for this study might be a critical point of discussion, especially since the group youngest patients is small. Previous research (Charman et al., 2004; Whitehouse et al., 2017; Mahapatra et al., 2018) has shown that the use of the ATEC as the primary outcome measure has some inherent drawbacks. The variety of measures amongst the ATEC's subscales fails to differentiate developmental-specific from symptom-specific changes. Especially in younger patients, the positive outcome measured with the ATEC could relate to a spontaneous transition to the next development phase during the study. These limitations should be considered when framing the data and interpreting the positive results with large effect sizes.

Conclusions

This pilot study explored the effect of ReAttach on problems of everyday functioning in patients with ASD. The preliminary results suggest that ReAttach has a positive effect on the everyday functioning of patients with ASD in several developmental areas which can be achieved in a short time. Independent future research is nevertheless warranted to corroborate these preliminary results in a randomized, controlled trial and explore the underlying mechanisms.

Disclosure

Paula Bartholomeus is the developer of ReAttach, president of ReAttach Therapy International Foundation and Director of ReAttach Academy. She received no funding for this study.

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APPENDIX : ATEC question summary

I Speech / Language / Communication

- 1 Knows own name
- 2 Responds to 'No' or 'Stop'
- 3 Can follow some commands
- 4 Can use one word at a time
- 5 Can use 2 words at a time
- 6 Can use 3 words at a time
- 7 Knows 10 or more words
- 8 Can use sentences with 4 or more words
- 9 Explains what he/she wants
- 10 Asks meaningful questions
- 11 Speech tends to be meaningful / relevant
- 12 Often uses several successive sentences
- 13 Carries on fairly good conversation
- 14 Has normal ability to communicate for his/her age

II Sociability

- 1 Seems to be in a shell - you cannot reach him/her
- 2 Ignores other people
- 3 Pays little or no attention when addressed
- 4 Uncooperative and resistant
- 5 No eye contact
- 6 Prefers to be left alone
- 7 Shows no affection
- 8 Fails to greet parents
- 9 Avoids contact with others
- 10 Does not imitate
- 11 Dislikes being held / cuddled

- 12 Does not share or show
- 13 Does not wave 'bye"
- 14 Disagreeable / not compliant
- 15 Temper tantrums
- 16 Lacks friends / companions
- 17 Rarely smiles
- 18 Insensitive to other's feelings
- 19 Indifferent to being liked
- 20 Indifferent if parent(s) leave

III Sensory / Cognitive Awareness

- 1 Responds to own name
- 2 Responds to praise
- 3 Looks at people and animals
- 4 Looks at pictures (and T.V.)
- 5 Does drawing, colouring, art
- 6 Plays with toys appropriately
- 7 Appropriate facial expression
- 8 Understands stories on T.V.
- 9 Understands explanations
- 10 Aware of environment
- 11 Aware of danger
- 12 Shows imagination
- 13 Starts activities
- 14 Dresses self
- 15 Curious, interested
- 16 Venturesome – explores
- 17 "Tuned in" - not spacey
- 18 Looks where others are looking

IV **Health / Physical / Behavior**

- 1 Bed-wetting
- 2 Wets pants / diapers
- 3 Soils pants / diapers
- 4 Diarrhea
- 5 Constipation
- 6 Sleep problems
- 7 Eats too much / too little
- 8 Extremely limited diet
- 9 Hyperactive
- 10 Lethargic
- 11 Hits or injures self
- 12 Hits or injures others
- 13 Destructive
- 14 Sound-sensitive
- 15 Anxious / fearful
- 16 Unhappy / crying
- 17 Seizures
- 18 Obsessive speech
- 19 Rigid routines
- 20 Shouts or screams
- 21 Demands sameness
- 22 Often agitated
- 23 Not sensitive to pain
- 24 "Hooked" or fixated on certain objects / topics
- 25 Repetitive movements (stimming, rocking etc)

Chapter 5

Randomized comparison of W.A.R.A. (Wiring Affect with ReAttach) versus Distraction: A pilot study assessing the efficacy of an ultrafast transdiagnostic intervention

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Abstract

Background: Generally, neuropsychiatric patients share different symptoms across nosological categories, such as, amongst other, psychological distress, mood alterations, anxiety, and self-regulation disturbances.

ReAttach is a novel psychological intervention with its key elements being external affect and arousal regulation, stimulation of multiple sensory processing, conceptualization, affective mentalization, and associative memory processing. ReAttach has been hypothesized to be effective in reducing symptom severity in different psychiatric conditions. Given the limited information currently available, the present study aimed to investigate the effect of main ReAttach elements called “Wiring Affect with ReAttach” (W.A.R.A.) on negative affect (NA), and to compare it with “distraction,” another well-established affect-regulating strategy.

Methods: We used a single-blind, randomized controlled crossover equivalence design to compare the efficacy on NA regulation of W.A.R.A. versus distraction in 101 patients with different neuropsychiatric disorders.

Results: The results showed a significant difference ($p < 0.001$) in response to W.A.R.A. vs. distraction, with W.A.R.A. being significantly more effective in regulating NA, with a large effect size ($d_{RMpooled} = 2.38$) and a high probability (95%) of success.

Limitations: The heterogeneity of the study population makes generalization and clear recommendations for specific patient groups difficult. The Numeric Rating Scale might have prevented detection of increased NA when the baseline scores were high. More in-depth research is needed to explore the W.A.R.A. technique and the extent of confounding variables such as the placebo effect.

Conclusions: The findings suggest that W.A.R.A. may be an effective, accessible, and brief intervention reducing negative affect. Although premature, these first results are encouraging.

1. Introduction

According to the World Health Organization (W.H.O.), in the last years, 25 % of European adults have been suffering from mental health problems, especially those involving affective disorders (W.H.O., 2015). Affect is an individual sensory experience that might serve as an essential factor within a

wide range of psychological processes. Affective states influence the individual's physical, cognitive, emotional, and behavioral functioning (Aldao, 2010; Schultheis, 2019; Weiss, 2019). Arousal regulation, sensory integration, and conceptualization can be regarded as requirements for negative affect (NA) regulation.

During NA regulation, unpleasant internal and external sensory stimuli need to be integrated, identified, and conceptualized as emotion or pain (Corder, 2019; Slaby, 2019). The role of the therapist in mediating the patient's arousal and the mood is essential, which is emphasized by research showing that arousal and NA are co-regulated by both the patient and the social environment (Barrett, 2014; Krueger, 2016; Slaby, 2019). Different attentional strategies such as distraction (Fox 2003, Rothbart 1981) and affect-biased attention (Morales et al., 2016) have been shown to decrease NA (Posner et al., 2012, 2014; Gross et al., 2011; Gyurak et al., 2011; Bronson 2000; Todd et al., 2012; Todd and Anderson, 2013). Distraction is a cognitive emotion regulation strategy and refers to diverting attention away from NA by performing a working memory task (Koch et al., 2018, Gross et al., 2011; Gyurak et al., 2011; Fox and Calkins, 2003; Bronson, 2000). It is a self-regulation technique of shifting the attention away from the unpleasant internal or external stimuli to reduce negative affect. Harman et al. (1997) stated that for infants, a distraction for 10, 30, or 60 seconds is equally soothing. She also found a resurgence of distress expression after the distraction.

ReAttach is another psychological intervention, in which environmental affect and arousal regulation, multiple sensory stimulations, and social cognitive training are combined (Weerkamp-Bartholomeus, 2018). Practical evidence reveals that ReAttach is a gentle and accessible learning intervention that reduces psychological distress and enhances learning conditions (Weerkamp-Bartholomeus 2015, 2018). During ReAttach, the therapists provide tactile stimuli by gently tapping on the palms of the patient's hands. Some data demonstrated that low intensity, non-noxious activation of sensory nerves in the skin triggers oxytocin release (Uvnäs-Moberg et al. 2015; Walker et al., 2017). These findings suggest that perhaps even during ReAttach, by low intensity, non-noxious tactile activation of the hands, the natural bodily release of oxytocin, with its calming and relaxing effect, could be triggered.

W.A.R.A. is a sub-element of ReAttach, explicitly aiming at wiring unpleasant feelings to a sizeable neural ensemble, actively composed by the therapist through simultaneous activation of multiple concepts under ReAttach conditions (Weerkamp-Bartholomeus, 2019).

This pilot study aimed to investigate the efficacy of W.A.R.A. on NA in a single-blinded randomized controlled setting versus distraction in different neuropsychiatric conditions.

2. Subjects and Methods

2.1 Study Design

We used a single-blind, randomized controlled, crossover equivalence design, to compare the efficacy on NA regulation of W.A.R.A. versus distraction in Dutch patients with different neuropsychiatric disorders. The group of patients experienced problems in daily life functioning, such as dealing with stressful events, self-regulation, and executive functioning. The data were sampled as part of care as usual in Dutch clinical therapeutic settings, and therefore permission from the medical ethics review committee was not required. The trial was carried out by the ReAttach Therapy International Foundation in the Netherlands.

A priori power analysis was performed in G. Power (Faul, 2007) to calculate the study's required sample size. To detect clinically significant differences in the outcome (O.C.) measures with 80% power and an expected effect size of 0.30 ($\alpha=.05$ two-sided) and presuming a drop-out rate of 1% a minimal sample size of 95 was required. We strived to recruit a sample of 90 - 100 patients in total. Patients were 101 adult patients (76 women and 25 men, mean age 42.61+SD 13.05 years) with neuropsychiatric disorders recruited by 13 qualified Dutch ReAttach therapists with a private practice (registered at reattachregister.org). Fifty-six patients had been diagnosed by a psychiatrist, (neuro)psychologist, or neurologist, as shown in Table 1. The remaining forty-six patients signed up for ReAttach treatment before diagnostics.

In our sample, 21 patients used medication, as presented in Table 1.

The medicines of all subjects were expected to remain stable during the study, due to the short study period (one therapy session). Dutch ReAttach therapists assessed eligibility, and we included adult patients who provided informed consent to participate in the study conducted at the time of the first ReAttach session. Exclusion criteria were reported suicidality risk and alcohol or drug abuse during the investigation.

Diagnoses and medication	N
ADHD	4
Anxiety Disorder	4
Burnout	9
Cancer	1
Chronic Fatigue Syndrome	3
Chronic Pain	6
Depression	5
Diabetes	1
Eating Disorder	3
Functional Neurological Disorder	2
Inflammatory Bowel Disease	2
Obsessive Compulsive Disorder	1
Personality Disorder	3
PTSD	5
Sensory Processing Disorder	11
Tinnitus	1
Traumatic Brain Injury	3
Citalopram	4
Fluoxetine	2
Seroxat	5
Concerta	2
Ritalin	1
Strattera	1
Paracetamol	3
Diclofenac	2
Asacol	1

Table 1: Sample description (N=101) of diagnoses and medication

Fig. 1 CONSORT diagram of study recruitment, treatment allocation and assessment including demographic characteristics

Randomization and intention to treat

The therapists were randomly assigned to group A (first distraction and secondly W.A.R.A.) or B (first W.A.R.A. and secondly distraction) with a random plan generator as followed: therapists 1, 5, 7, 8, 9 and 12 were assigned to group A, and 2, 3, 4, 6, 10, 11 and 13 to group B. Subjects could leave the study at any time for any reason without consequences.

Blinding

Two self-administered questionnaires were designed including questions about demographics, therapist instructions, and questions about NA at different time points. One survey included instructions and measurements for group A (first distraction and secondly W.A.R.A.) and another questionnaire for group B (first W.A.R.A. and secondly distraction). All therapists received a personal hyperlink leading to the survey for either group A or B. The therapists and patients knew that distraction and W.A.R.A. were offered as extra tools to regulate NA. They were blind to the sequence and comparison of both interventions. As a result of the randomization and anonymous data sampling, the researcher was blind to the assignment of patients. Figure 1 shows the flowchart of study recruitment, treatment allocation, assessment, gender and age. All the patients provided informed consent for anonymized data processing and participation in the research by an online agreement.

2.2 Interventions

Qualified ReAttach therapists (registered at reattachregister.org) provided W.A.R.A. and received online instructions on how to provide distraction. Psychopharmacological treatment was allowed since medications remained stable during this study, which lasted only one therapy session.

Distraction

In this study, distraction was offered as a self-regulation task to shift the attention away from an unpleasant feeling. All ReAttach therapists received the same online instructions for distraction: The ReAttach therapist first instructed the patient to focus on the unpleasant feeling, and secondly asked the patient to distract him/herself by counting to ten. Since affect is co-regulated by the social environment (Slaby, 2019; Krueger, 2016; Barrett, 2014) the presence of the therapist played a role in the intervention outcome of distraction. This co-regulation effect was counterbalanced for by randomization and the within-subjects design.

W.A.R.A.

W.A.R.A. is designed for ReAttach therapists working with patients with chronic emotional dysregulation, sensory over responsivity, and chronic pain. Even though previous studies have shown that ReAttach reduces overlapping symptomatology in patients with emotional dysregulation and chronic pain (Ter Maat, 2018; Chauhan, 2018; Petter, 2018; Weerkamp-Bartholomeus, 2018), there were still patients with persistent complaints of hypersensitivity of intense, unpleasant feelings. During ReAttach, we usually aim to influence these symptoms by social cognitive training under optimal sensory processing conditions. ReAttach offers patients the opportunity to train mentalization, to modify cognitive biases, and to use associative memory formation for active learning (Bartholomeus, 2013). The cause of and therefore, a possible solution for these persistent symptoms could lie in the fact that the regular ReAttach procedure went too fast for these patients, skipping a necessary step in the development of their healthy sensory stimulus processing. Reviewing the work of Slaby (2019) and Krueger (2016) on emotional and physical pain, the insight arose that the regular ReAttach procedure aimed to change concepts, namely the concept of pain and the concept of emotion, by identification with and adjusting them, and by fostering more adaptive coping styles. However, for patients with persistent complaints, it might be adequate to change our main focus to unpleasant feelings for which there are no words yet. In other words, with W.A.R.A., we address to pre-conceptual negative affect instead of working with concepts of pain or emotion. During the W.A.R.A. instruction, the therapist co-regulates negative affect, which is only referred to as an unpleasant feeling, by manipulating arousal and sensory stimuli. Immediately after the downregulation of the arousal, the therapist mentions five positive concepts that follow each other quickly and are not related but are grouped only for this W.A.R.A. exercise. During the downregulation, the patient needs to focus on the pre-conceptual unpleasant feeling and simultaneously associate on the presented conceptual ensemble. Subsequently, the patient receives an instruction for associative memory formation (remember this) during a few seconds of fast tapping. After a second downregulation, the patient integrates both the unpleasant feeling and the conceptual ensemble provided that the timing and co-regulation are optimal. In the period of the W.A.R.A. training courses, it became clear that therapists who failed to provide the group of positive concepts quickly enough after downregulation were unsuccessful. As previously stated by Donald Hebb (1949), timing is of significant importance:

"Cells that fire together, wire together." In Wiring Affect with ReAttach, this is undoubtedly true.

W.A.R.A. involved external affect regulation and arousal regulation by the therapist. At first, the therapist stimulated multiple senses: visual by facial expression and eye contact, auditive by verbal instruction or by making sounds and tactile by fast tapping on the back of the patient's hands. The therapist instructed the patient to close the eyes and focus on the unpleasant feeling during the complete exercise. Shortly after that, the therapist activated low arousal by the change of tapping frequency. During a low-frequency tapping, the therapist instructed the patient to focus on five positive concepts (such as enthusiasm, love, holiday, friends, excitement). Then the therapist changed the tapping speed again into fast tapping, to activate optimal arousal to process the next instruction: to remember the exercise so far. Immediately after this instruction, the therapist changed tapping speed again towards low arousal. During the low arousal, the therapist remained silent for 20 seconds. The therapist ended the W.A.R.A. exercise under fast tapping conditions by the instruction to open the eyes.

2.3 Procedure

At the beginning of the therapy session (T0), patients of both groups were asked to focus on NA and rate the intensity of unpleasantness on an 11 points numerical rating scale, commonly used to evaluate the severity of pain (Williamson and Hoggart, 2005). Instead of referring to physical or emotional pain, we asked the patients to assess the unpleasant feeling on a scale of 0 (not unpleasant at all) to 10 (most unpleasant).

After the baseline rating, subjects from group A received distraction, and patients from group B received W.A.R.A. Both interventions took approximately the same amount of time: between 60 and 90 seconds. Immediately after the first intervention (T1), the therapists asked the subjects if the unpleasant feeling was still present or gone. Descriptive statistics with percentage values of frequencies indicated that immediately after the intervention (T2), 20% of the subjects after distraction, and 74% of the patients directly after W.A.R.A claimed that the unpleasant feeling was gone, as presented in Table 2. All patients were asked to refocus on the negative feeling to investigate if they could bring the feeling up again. Subsequently, all subjects were asked to rate the intensity of unpleasantness for the second time (T2).

Immediate response	The feeling is gone	The feeling is not gone
Distraction (n=55)	20%	80%
W.A.R.A. (n=46)	74%	26%

Table 2: Comparison of immediate post intervention response (T1)

After re-engagement with the feeling, 18.2% of the subjects who received distraction as the first intervention and 26.1 % of the individuals who received W.A.R.A., stated that the unpleasantness was less intense or changed. As presented in Table 3, 81.8 % of the subjects who received distraction compared to 6.5 % of the persons who received W.A.R.A. reported no change at all. No patients in the distraction group, as compared with 67.4% of the patients of the W.A.R.A. group, claimed after re-engagement that the unpleasant feeling was gone. If subjects could not bring the negative feeling up again, the NA was rated as 0. Patients who had lost the negative feeling could not follow through with the double task and partially dropped out.

After re-engagement	The feeling is gone	Less intense or changed	Hasn't changed at all
Distraction (n=55)	-	18.2%	81.8%
W.A.R.A. (n=46)	67.4%	26.1%	6.5%

Table 3: Comparison of post-intervention response after refocusing (T2)

Immediately after the second rating (T2), the remaining subjects from group A received W.A.R.A. as a second intervention, and the remaining subjects from group B received distraction as a second intervention. After the second intervention, all subjects were asked to refocus on the negative feeling and to rate the intensity of unpleasantness for the third time (T3). The zero scores at T2 from subjects who partially dropped out were carried on to T3 due to the intention to treat procedure. Figure 2 represents the comparison of mean affect scores at baseline (T0) and post-intervention (T2) for distraction as first intervention (M1 – 7.87, M2 = 7.55) and W.A.R.A. (M1 = 7.55, M2 = 1.24) as first intervention. After the third rating, all subjects continued the therapy with their first ReAttach session.

Figure 2: Mean baseline (T0) and post-intervention ratings (T2) on NA for distraction as first intervention and W.A.R.A as first intervention.

2.4 Data analysis

Descriptive statistics and a Consort Flowchart were used to contextualize the demographic characteristics of the study population. We used the Mann Whitney U Test, Wilcoxon Signed Rank Test, and one-way ANOVA for comparison of demographic characteristics and outcome measures between the groups at baseline. Mann-Whitney U test was used for comparison of intervention outcome between groups. A Friedman test was run to compare intervention for the within-subjects design. Pairwise comparisons were performed (SPSS Statistics, 2012). Effect-sizes for the intervention outcomes within-subjects were estimated by single group pre-test post-test design by taking the correlation between pre- and post-test into account (Morris and Deshon, 2002; Morris, 2008). All statistical tests were two-sided, and we set the significance level at 5%. We reported the interpretation of effect sizes conform Cohen (1988). The Statistical Package for Social Science (SPSS) version 22 (Armonk, NY, USA) was used to analyse the research data (IBM, 2012).

3. Results

3.1 Descriptive Statistics

As shown in figure 1, the distribution of age and gender were the same in groups A and B. One-way ANOVA was conducted to assess whether there

were significant differences associated with pharmacological therapy. No differences were found between patients with medication (N=21) and patients without medication (N=80) in baseline NA rating. $F(1, 99) = .022, p = .881$ and after the double-task $F(1,99) = .824, p=.366$. The Mann-Whitney U test indicated that there was no significant difference ($Z = 0.574; p = .566$) between group A (mean rank 49.50) and B (mean rank 52.79) at baseline NA rating.

3.2 Comparison of distraction versus W.A.R.A.

Negative affect was significantly different at the different time points, $X^2(5) = 339.743, p < 0.005$. Figure 2 presents the mean baseline (T0) and mean post-intervention (T2) scores NA for distraction and W.A.R.A. as first intervention. We compared the intervention outcome (OC) at different timepoints by differences in NA-scores across group A and group B. The first intervention outcome (OC1) was significantly higher in group B (mean rank = 77.05, W.A.R.A.) than in group A (mean rank = 29.21, distraction, $U = 2463, z = 8.380, p < 0.05$). The second intervention outcome (OC2) was significantly higher in group A (mean rank = 73.00, W.A.R.A.) than in group B (mean rank = 24.70, distraction). There was no significant difference in the outcome of the double task (distraction and W.A.R.A., $U = 1258, z = -.045, p = .964$) (Figure 3a and 3b).

Figure 3a: Repeated measures group A

The intervention outcome was statistically significantly different between the interventions, $X^2(2) = 193.729$, $p < 0.001$. The post-hoc analysis revealed that W.A.R.A. (Mdn = 7.00) was statistically significantly more effective than distraction (Mdn = .00) ($p < 0.001$), with a large effect size for W.A.R.A. ($d_{RMpooled} = 2.384$, 95% Confidence Interval 2.521 – 3.069) and a medium effect size for distraction ($d_{RMpooled} = 0.38$, 95% Confidence Interval 0.183 – 0.577).

Figure 3b: Repeated measures group B

In group B only 13 subjects received distraction. The NA had disappeared after W.A.R.A.; therefore, 33 out of 46 subjects could not bring the NA up again and did not receive distraction as a second task. In the group A ($N = 55$) where distraction was the first intervention, the mean difference between the pre-test ($M = 7.97$, $SD = 1.54$) and post-test ($M = 7.15$, $SD = 2.50$) was 0.72 and in group B ($N = 46$) where distraction was offered as the second intervention the mean difference was 0.50 ($M1 = 1.24$, $SD = 2.18$ and $M2 = 0.74$, $SD = 1.83$).

The distribution of distraction was similar in both groups, as assessed by visual inspection. The efficacy of distraction was not significantly different between group A (Mdn = .00) and group B (Mdn = .00, $U = 1206$, $z = -.507$, $p = .612$), with medium effect sizes for group A ($d_{RMpooled} = 0.42$) and group B ($d_{RMpooled} = 0.36$). The distribution W.A.R.A. was similar in both groups, as assessed by visual inspection. The efficacy of W.A.R.A. was not significantly different between group A (Mdn = 7.00) and group B (Mdn = 7.00, $U = 1275$,

$z = .069$, $p = .945$ with large effect sizes for group A ($d_{RMpooled} = 2.173$) and group B ($d_{RMpooled} = 2.681$). Evaluation of the intervention outcomes in terms of success (positive change) or failure (no change or negative change) resulted in a probability of success for W.A.R.A. of 95%. The likelihood of success for distraction was 26.7%.

4. Discussion

The present study aimed to investigate the efficacy of W.A.R.A., an affect regulation strategy, based on disengagement (Gross 2011, Gyurak 2011, Fox 2003, Bronson 2000), through a prospective single-blinded, randomized controlled, crossover trial, in a large sample of patients with different neuropsychiatric conditions. W.A.R.A. is an intervention of only ninety seconds, build up from the critical elements of ReAttach, a sensory and social cognitive integration training, on NA (Weerkamp-Bartholomeus 2018, 2019). This study is the first to investigate the efficacy of W.A.R.A. as compared with distraction, a psychological technique that is an effective emotion regulation strategy based on diverting attention away from NA by performing a working memory task (Koch et al., 2018).

The results of this study revealed that W.A.R.A. was significantly more beneficial with a large effect size ($d_{RMpooled} = 2.38$), as compared with distraction with a medium effect size ($d_{RMpooled} = 0.38$).

After W.A.R.A., 89% of the subjects reported that the NA was less intense/had changed (26.1%) or was gone (67.4%). We found a carryover order effect after W.A.R.A. as the first intervention, but not after distraction as the primary intervention. Therefore, a secondary outcome of the study was that, in contrast to W.A.R.A., the effect of distraction was temporary. Re-engagement with the NA after the distractive task caused a revival of the unpleasant feeling in all patients. After re-engagement, no subject claimed that the negative feeling had disappeared after distraction. A vast majority of the distraction patients (82 %) reported that after re-engagement, the NA had not changed at all. The remaining distraction patients (18.2%) indicated that the intensity or the feeling had changed in the meantime. Internal or external change in arousal might have caused these changes in intensity since arousal was co-regulated by the presence of the therapist.

It is not taken for granted that patients agree to the tapping on the hands. W.A.R.A. requires proximity to the therapist and the patient's trust. Before any treatment can be offered, the ReAttach therapist will have to invest in a good

working relationship with the patient. It is common practice and necessary to provide basic information about ReAttach and individually pay attention to the multiple sensory stimulations, the arousal regulation, and to the associative nature of ReAttach. Since W.A.R.A. consists of the essential elements of ReAttach, it makes the exercise particularly suitable as a first introduction of the ReAttach intervention. Therefore, W.A.R.A. is scheduled before the start of the first ReAttach session.

In this study, all participants went along with the tactile stimulations, probably due to the explanation of the intervention, and the predictability of the touch. It is an interesting phenomenon that W.A.R.A. can be used to reduce tactile over-responsivity. Patients with resistance to the proximity of the therapist or to physical contact, receive self-regulation exercises. W.A.R.A. can be provided as a self-regulation tool. This study focuses exclusively on W.A.R.A. provided by the therapist. Another research is currently investigating the efficiency of W.A.R.A. provided as a self-regulation tool versus W.A.R.A. face to face by the therapist.

The conceptualization of negative affect in unpleasant feelings may still be a point of discussion. During the W.A.R.A. instruction, language is essential. The therapist is instructed not to visualize or conceptualize the unpleasant feelings for the patient to be able to address pre-conceptual negative affect: it is only referred to as an unpleasant feeling. The grouped words needed to build a temporary ensemble of concepts may be randomly chosen. To make W.A.R.A. a pleasant intervention, the therapists are instructed to select positive concepts that fit the patient's world of experience.

Besides W.A.R.A., that in the current study showed a superior outcome effect compared to Disengagement, Eye Movement Desensitization and Reprocessing (EMDR.) therapy, which is similar to Disengagement in terms of taxing the working memory, also proved to be effective in terms of reducing NA (Van Etten, 1998; Bradley, 2005; Davidson and Parker, 2005). The taxing of working memory for both W.A.R.A. and EMDR therapy might be different. W.A.R.A. provides external arousal regulation, multiple sensory stimulations, and mentalization to active generations by the subject. EMDR therapy does this by a standard protocol that includes eight phases and bilateral stimulation (usually horizontal saccadic eye movements) to reduce NA caused by traumatic memories (Shapiro, 2005). Therefore, EMDR is a strategy requiring long-term sessions, while W.A.R.A. is shorter, more cost-effective, and, as such, with better patients' compliance. The most essential difference between W.A.R.A. and EMDR is that W.A.R.A. (and ReAttach) is not trauma focused.

In any case, future studies comparing the efficacy of W.A.R.A. versus EMDR therapy in terms of NA reduction and regulation would be desirable.

The present study suffers from several limitations that should be acknowledged. First, the heterogeneity of the research population makes it challenging to interpret the study outcomes and to give clear recommendations for specific patient groups. Second, we used a Numeric Rating Scale, initially designed for the evaluation of pain (Williamson and Hoggart, 2005), to rate the intensity of unpleasantness. Although this rating scale provided continuous data, these were not normally distributed: this might have prevented the detection of the increase of NA when the baseline scores were high. Furthermore, we have not assessed to what degree the reduction of NA was clinically relevant in the broader psychopathological context. This requires further investigation. The presence of a therapist played a role in the outcome of both W.A.R.A. and distraction since affect is co-regulated by the social environment (Slaby, 2019; Krueger, 2016; Barrett, 2014). This co-regulation effect was counterbalanced by randomization and the within-subjects design. As in any psychotherapy, placebo effects likely played a role in both interventions (Enck and Zipfel, 2019). W.A.R.A. and distraction are not comparable in the intensity of contact with the therapist, and the expectation-inducing effect of W.A.R.A. may be more powerful. The fact that W.A.R.A. involves touch and distraction not may also influence the results. Further research should examine these contributing factors more in detail.

5. Conclusions

Although carried out in a single-blinded, controlled design, the study must be considered to be a pilot. Nevertheless, the results would suggest that W.A.R.A. may be an effective, accessible, and short transdiagnostic intervention for the reduction of NA in different neuropsychiatric disorders. Again, W.A.R.A. seemed without short-term revival after re-engagement. As compared with distraction, a self-regulation exercise with a temporarily medium effect, W.A.R.A. was found to be significantly more beneficial. However, our findings require to be replicated in larger samples of patients with specific neuropsychiatric conditions, and/or to be corroborated by follow-up data to explore how long W.A.R.A. effects might last. Our opinion is that W.A.R.A., and other psychological techniques if substantiated by further data gathered in controlled trials, would constitute accessible, gentle, and evidence-based transdiagnostic interventions for specific symptom clusters present in a wide range of different neuropsychiatric conditions.

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Chapter 6

Remote W.A.R.A. compared with face-to-face W.A.R.A.: a pilot study

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Abstract:

Background: Since the outbreak of the COVID-19 pandemic and its social restriction measures, online therapy is a life-saving possibility for patients with acute stress. Wiring Affect with ReAttach (W.A.R.A.) is a brief psychological intervention aiming to decrease negative affect, that can be offered online.

Methods: We assessed the effect of remote W.A.R.A. on negative affect in 37 patients. Consequently, we compared the effect of remote W.A.R.A. versus face-to-face W.A.R.A on negative affect in a cross-sectional design.

Results: W.A.R.A. remote therapy provoked a significant reduction of negative affect with a large effect size ($d=3.08$, $p < 0.001$). However, the reduction on negative affect was smaller than with W.A.R.A. face-to-face. We found a substantial difference between W.A.R.A. remote therapy and W.A.R.A. face-to-face in decrease of negative affect ($d=1.36$, $p < 0.001$).

Limitations:

We designed a numeric rating scale for evaluating negative affect. We investigated the impact on negative affect by assessing 'unpleasant feelings'. This conceptualization of negative affect might still be a point of discussion.

Conclusions: The study's findings indicated that W.A.R.A. remote therapy significantly reduced negative affect, but to a lesser extent than W.A.R.A. face-to-face. Nevertheless, W.A.R.A. remote therapy might offer a fast relief, especially when personal contact is difficult.

Keywords: W.A.R.A.; Remote Therapy; ReAttach; Affect Regulation; Emotion Regulation; Internet-Based Therapy

1. Introduction

Wiring Affect with ReAttach (W.A.R.A.) is a brief psychological intervention, generally provided by trained ReAttach therapists for patients with chronic pain or emotional dysregulation aimed to decrease negative affect (Weerkamp-Bartholomeus, 2019, 2020). W.A.R.A. is made up of essential elements of ReAttach, such as arousal regulation, sensory stimulation, multiple sensory processing, and associative memory formation (Bartholomeus 2013;

Weerkamp-Bartholomeus, 2020). During this W.A.R.A. exercise, ReAttach therapists specifically aim at wiring negative affect by simultaneous activation of multiple associations under ReAttach conditions (Weerkamp-Bartholomeus, 2019). Instead of focusing on emotional or physical pain, in W.A.R.A., the therapists work with general unpleasant feelings for which there are no words yet. When W.A.R.A. is provided face-to-face, the therapist externally regulates the patient's arousal and sensory processing and requires the therapist's proximity and physical contact through the gentle tapping on the patient's hands. In W.A.R.A. remote therapy, the therapist instructs the patient to self-regulate the arousal and sensory processing by verbal instructions and exercises. In both cases, the goal of W.A.R.A. is to conceptualize unpleasant feelings through sensory integration using associative memory formation.

Due to its accessibility and simplicity, W.A.R.A. might serve as a self-regulation tool provided by remote therapy. W.A.R.A. is a potentially exciting application since we are currently dealing with the COVID-19 pandemic. Since the increasing demand for psychological support as a result of the current COVID-19 outbreak, online therapy is a life-saving possibility to help patients deal with psychological distress without a violation of the social restrictions imposed in almost all countries to limit the diffusion of the virus.

The pandemic's impact on mental and physical health will be devastating unless we provide our patients with a therapy or self-regulation strategy to dampen the acute stress response (Porges, 2020). Indeed, at times of crisis, it is of utmost importance to provide psychological support as soon as possible (Marazziti, 2020; Srivastava, 2020).

Accessible forms of psychotherapy that can help to alleviate the initial psychological distress may prevent the development of post-traumatic stress disorders, obsessive-compulsive disorders, depression, and social anxiety (Porges, 2020; Mucci, 2020; Di Giuseppe, 2020).

By providing self-regulation strategies, such as W.A.R.A.-remote therapy, psychologists might be able to guide patients into the downregulation of their psychological distress. Hence, as soon as the COVID-19 pandemic began, we started to give free online W.A.R.A. remote therapy courses to provide this potential first-aid psychological intervention to professionals worldwide (Weerkamp-Bartholomeus, 2020).

Although previous studies assessed the effectiveness of W.A.R.A. performed by a therapist through face-to-face contact, no research has yet been conducted into the application of W.A.R.A. delivered online. We examined the efficacy of remotely delivered W.A.R.A. in the reduction of negative affect and

compared the results of the W.A.R.A. remotely provided with results of W.A.R.A. face-to-face by a therapist.

2. Subjects and Methods

2.1 Study Design

Dutch therapists who followed the online W.A.R.A. remote therapy course, treated 37 patients with stress-related complaints (Men 27 %, Women 73%; mean age + SD 47.6 + 18.7 years). Reported suicidality risk and alcohol or drug abuse during the session were exclusion criteria for W.A.R.A. remote therapy. All patients provided written informed consent to participate in the study. Information about patients' diagnoses and medication is listed in Table 1. A within-subjects design was used to assess the efficacy of W.A.R.A. remote therapy in this group of 37 patients.

To compare the efficacy of W.A.R.A. remote therapy versus W.A.R.A. face-to-face we used a cohort of 46 patients (Men 30%, Women 70%; mean age + SD 43.3 + 13.3 years) from a previous study who received W.A.R.A. face-to-face (Weerkamp-Bartholomeus, 2020). We assessed the comparability of both groups on the distribution of age, gender and base-line negative affect score and found no significant differences between groups. Both groups of patients experienced problems in the regulation of stress. All data were sampled as part of care as usual, and therefore permission from the medical ethics review committee was not required. The trial was carried out by ReAttach Therapy International Foundation in the Netherlands.

2.2. Interventions

Wiring Affect with ReAttach (W.A.R.A.)

Qualified ReAttach therapists provided W.A.R.A. conform trained protocol (Weerkamp-Bartholomeus, 2019, 2020). Normally, a therapist regulates the participant's arousal, sensory stimuli, and negative affect during W.A.R.A. This requires physical proximity of the therapist: W.A.R.A. face-to-face. In this study, we compared the results of a group of 46 patients who received W.A.R.A. face-to-face with a group of 37 patients who received W.A.R.A. remote therapy.

For the remote therapy we simplified the W.A.R.A. instruction. By remote instruction, the patient needs to adopt several skills that the therapist normally performs, such as sensory stimulations (tapping) and arousal regulation by change of tapping speed. Therefore, we chose to simplify the tapping technique which we normally use for the downregulation, to gently pressing on a surface. At first the patients learned how to optimize arousal for multiple sensory processing and dampen unpleasant feelings through tactile stimulation. The fast, tactile stimulation at the beginning of W.A.R.A. and during the instruction of memory formation, remained the same. The students of the W.A.R.A. remote therapy course learned to tap fast as soon as they heard the word "tap" and downregulate as soon as they heard "stop." During W.A.R.A. face-to-face, the therapist delivers a tailored intervention by adapting the voice and choice of positive concepts that appeal to the patient. During the W.A.R.A. remote therapy course, no such adjustment was made. We decided to offer every professional the same video instruction with similar positive concepts during low-frequency tapping (music, dance, favorite meal, enthusiasm, love, gratitude, and the sun). Also, we offered recorded voice instructions on-line as an aid for W.A.R.A. self-regulation.

2.3. Procedure

All patients received the same questionnaire to score negative affect before and after the intervention. We conceptualized negative affect as 'unpleasant feeling,' rated on an 11-point numeric rating scale developed for by us. At baseline, the patients rated an unpleasant feeling on a scale of 0 (not unpleasant at all) to 10 (most unpleasant).

After this baseline measurement, they received the intervention with was either W.A.R.A. face-to-face or W.A.R.A. remote therapy. After the intervention, we immediately asked the patients if they could still feel this unpleasant feeling: yes or no. Finally, we asked these patients to re-engage with the negative affect and again rate the unpleasantness.

2.4. Data analysis

We used descriptive statistics and a Consort Flow-chart to contextualize the demographic characteristics and the flow of the patients. With the Wilcoxon Signed Rank Test, we compared the baseline and post-test negative affect ratings within-subjects. We used one-way ANOVA for comparison of

demographic characteristics, and mean affect rating at baseline between groups. To assess differences in outcome between groups, we used the Mann-Whitney U test. Pairwise comparisons were performed (S.P.S.S. Statistics, 2012). The statistical analyses were two-sided, and we set the significance level at 5%. We reported the interpretation of effect sizes conform Cohen (1992). To analyse the data, we used the Statistical Package for Social Science (S.P.S.S.) version 22 (Armonk, NY, U.S.A.) (I.B.M. Corp., 2012).

W.A.R.A. remote therapy Treated by the 1 st generation trained professionals provided informed consent (N=37, Male 27%, Age M 47.6, SD 18.7, 13-87)	W.A.R.A. face-to-face Treated by ReAttach therapists in a previous study and received W.A.R.A. face-to-face as 1 st intervention. (N=46, Male 30%, Age M 43.3, SD 13.3,17-68)
Baseline Negative Affect Rating (N=83)	
W.A.R.A. remote therapy (N=37)	W.A.R.A. face-to-face (N=46)
Immediate response after intervention (N=83)	
Negative Affect Rating after intervention and re-engagement (N=83) Post-test	
W.A.R.A. remote therapy Comparison of Negative Affect Rating before and after W.A.R.A.	W.A.R.A. face-to-face Comparison of Negative Affect Rating before and after W.A.R.A.
Comparison of mean difference in negative affect between groups: W.A.R.A. remote therapy versus W.A.R.A. face to face	

Figure 1: CONSORT flow diagram and demographics of the cross-sectional cohort study

Demographic patient's characteristics	Face-to-Face	Remote
Sample Size, N	46	37
Gender, Male in %	30	27
Age, M (SD)	43.3 (13.3)	47.6 (18.7)
Age, min-max	17-68	13-87
Diagnoses, Frequency (N)	Face-to-Face	Remote
AD(H)D	2	1
Anxiety Disorder	1	
Autism Spectrum Disorder		1
Burnout	4	
Chronic Fatigue	3	
Chronic Pain		1
Depression	3	1
Diabetes		1
Eating Disorder	1	
Functional Neurological Disorder	1	
Personality Disorder	1	
PTSD	3	1
Somatization Disorder		1
Sensory Processing Disorder	5	
Tinnitus	1	
Traumatic Brain Injury		1
Medication, Frequency (N)	Face-to-Face	Remote
Antidepressant	1	
Stimulants	2	
Sedatives		1
Analgesics	1	2

Table 1. Sample description of patients (N=83)

3. Results

3.1 Descriptive Statistics

Figure 1 and Table 1 present the patient flow and descriptive characteristics of the cross-sectional study. With one-way ANOVA, we assessed differences between the groups in age, gender, or baseline scores. There were no significant differences in age $F(1,81) = 1.492, p = .225$, gender $F(1,81) = .113, p = .737$ or baseline score $F(1,81) = .049, p = .825$ between the W.A.R.A remote therapy group and the W.A.R.A. face-to-face group.

3.2 Effect on negative affect scores of W.A.R.A. remote therapy ($N=37$)

As shown in Figure 2, immediately after online therapy W.A.R.A., 24.3% of the respondents reported that the negative affect was gone. As shown in Figure 3, at baseline, the mean negative affect score of the W.A.R.A. remote therapy was 8.0 ($SD=1.2$). The mean negative affect score decreased to 4.4 ($SD=2.0$) after re-engagement.

We found symmetrically distributed difference scores, as assessed by a histogram with a superimposed normal curve. Of the 37 patients of the present study, 34 patients reported a reduction of negative affect, and 3 reported no change. The Wilcoxon signed-rank test determined that there was a significant decrease in negative affect ($Mdn = -4.00$) after W.A.R.A. remote therapy ($Mdn = 3.00$), compared to the negative affect before the intervention ($Mdn = 7.00$), $z = -5.10, p < .001$. The effect size was large, $d = 3.08$ (Cohen, 1992). Evaluation of the remote intervention outcomes in terms of success (positive change) or failure (no change or negative change) resulted in a probability of success for W.A.R.A.remote therapy of 92%.

3.3 Comparison W.A.R.A. remote therapy versus W.A.R.A. face-to-face

We compared the data from the W.A.R.A. remote therapy group versus the data from 46 patients from a previous W.A.R.A. face-to-face by therapist study (Weerkamp-Bartholomeus, 2020). As shown in Figure 2, immediately after the remote instruction, 24.3 % of the patients compared to 73.9% of the patients who received W.A.R.A. face-to-face reported that the negative affect was gone. In the group of patients who received W.A.R.A. face-to-face, the mean

negative affect scores decreased to 1.2 after re-engagement compared to 4.4 in W.A.R.A. remote therapy.

Figure 2: Immediate post intervention response of the patients after W.A.R.A. by remote therapy (N=37), versus W.A.R.A. by therapist (N=46).

Figure 3: Mean negative affect scores, before and after W.A.R.A. face to face (N=46) and W.A.R.A. remote therapy (N=37).

We run a Mann-Whitney U test to compare the reduction of negative affect of W.A.R.A. remote therapy versus W.A.R.A. face-to-face. Reduction of negative affect was larger after W.A.R.A. face-to-face (mean rank = 54.13) than after W.A.R.A. remote therapy (mean rank = 26.92), $U = 293.000$, $z = -5.144$, $p < .001$. The difference in reduction of negative affect was large $d = 1.36$ ($p < .001$).

Discussion

We examined the effect of W.A.R.A. remote therapy on negative affect and compared the reduction of negative affect of W.A.R.A. remote therapy versus W.A.R.A. face-to-face. W.A.R.A. remote therapy resulted in a significant decrease in negative affect with a large effect size. However, we found a larger reduction of negative affect after W.A.R.A. face-to-face compared to W.A.R.A. remote therapy.

The results of this pilot study suggest that even for a brief and accessible self-regulation exercise as W.A.R.A., face-to-face interaction with a therapist is more effective. W.A.R.A. face-to-face is also more favorable, considering the various ethical arguments against engagement in online psychotherapy such as privacy, confidentiality, and emergency issues (Stoll et al., 2020).

The availability, rapid transferability, lightness of the intervention, and efficiency of W.A.R.A. in decreasing negative affect should be strongly highlighted. The fact that the intervention can be used as a self-regulation tool also makes the application of W.A.R.A. remote therapy even more interesting. If we can actually train patients to use W.A.R.A. as a self-regulation technique, this will no doubt contribute to enhance their autonomy and self-control.

This research aimed to find out whether W.A.R.A. remote therapy might represent a valuable tool first-aid psychological intervention. According to us, this is particularly relevant at this time of COVID-19 pandemic. During this uncertain and challenging time, stress, and anxiety increase because we are all concerned about the magnitude and effects of this crisis (Albott et al., 2020). In times wherein psychological consultation is restricted, online psychotherapy might offer a solution. From a preventive point of view, it is vital to support professionals and patients with self-regulation strategies at hard times, such as the present scrambled by the COVID-19 pandemic (Marazziti, 2020; Porges, 2020). We would suggest that W.A.R.A. remote therapy, together with other strategies, might represent good opportunities in critical situations when psychological treatments are not available.

W.A.R.A. remote therapy can be compared with other short-term online self-help interventions, such as Compassion-Focused Therapy (Gilbert, 2010; 2014; Hudson et al. 2019) and other mindfulness-based interventions (Lilly et al. 2019) focusing on the downregulation of psychological distress (Porges, 2020) and promotion of calmness (Cheng et al. 2020; Sulaiman et al. 2020). An advantage of W.A.R.A. compared to other therapies seems that negative affect wired during W.A.R.A. becomes less intense or is gone, making it hard to reengage with the previous unpleasant feelings. Thus W.A.R.A. might be helpful to stop rumination. Since W.A.R.A. can be trained as a self-regulation technique, W.A.R.A.'s more frequent practice might improve stress-resilience in vulnerable patients. Since W.A.R.A. can be trained as a self-regulation technique, W.A.R.A.'s more frequent practice might improve stress-resilience in vulnerable patients. For more extended online therapies such as Online Group Schema Therapy Based Day-Treatment (van Dijk et al. 2020), W.A.R.A. remote therapy could be a welcome addition to teach patients with negative affect self-regulation. Even though the findings of this pilot study cannot be generalized to clinical populations, the results suggest that W.A.R.A. remote therapy has the potential as a brief first-aid psychological intervention.

We would acknowledge a criticism of the technique: W.A.R.A. remote therapy is beneficial as a strategy to deal with unpleasant feelings and psychological distress, but it cannot solve more severe mental health problems (Aldao, 2010). ReAttach therapists usually use W.A.R.A. as an additional tool during a treatment process to help patients reduce negative feelings for which there are no words yet. This exercise helps to regain self-control and to process unpleasant feelings very quickly. Therefore, W.A.R.A. is ideal for getting to know ReAttach, making ReAttach even more accessible. It should be noted that W.A.R.A. does not replace ReAttach as a schema therapy for adults and children or as a multimodal intervention for autism (Weerkamp-Bartholomeus, 2015; 2018). ReAttach, although also brief, is more extensive, which is necessary to, among other things, automate affect regulation, sensory integration, coherent conceptualization, and mentalization. W.A.R.A. is far too limited for treating complex problems, such as in patients with trauma, personality disorders, behavioral issues, or pervasive developmental disorders. This pilot study suffers from several limitations that should be mentioned, such as the design of the numeric rating scale, that was based on a numeric rating scale for the evaluation of pain (Williamson 2005). Although previous research from Slaby (2019) and Krueger (2016) support our choice, the

conceptualization of negative affect in a combination of arousal and unpleasant feelings might still be a point of discussion. More specifically, the question arises whether or not we can evaluate the reduction of such a wide variety of subjective unpleasant feelings.

In the near future, we would like to investigate the application of W.A.R.A. for specific patient groups. Since W.A.R.A. can be trained as a self-regulation technique, more frequent practice of W.A.R.A might improve stress-resilience in vulnerable patients. We think that it would be very interesting to investigate such W.A.R.A. training in a randomized controlled design with follow-up measurements.

Conclusions

W.A.R.A., normally provide face-to-face by a ReAttach therapist, can successfully be provided as remote therapy and significantly reduce negative affect. Although W.A.R.A. face-to-face is more favorable and more effective, these first results of W.A.R.A. remote therapy are encouraging.

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Conflict of Interest

Paula Weerkamp-Bartholomeus designed both ReAttach and W.A.R.A. The researchers received no funding for this study.

Data availability statement

The data that support the findings of the study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Chapter 7

ReAttach: overcoming psychological crises by fostering resilience? A pilot study.

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Under review

Chapter 8

General Discussion

Purpose of this dissertation

The overall aim of this dissertation was to explore the benefit of ReAttach, a transdiagnostic intervention for children and adults with mental health problems. The studies described in this thesis are inspired by clinical practice and the first assessing feasibility of a potentially effective intervention. There are several reasons why implementing ReAttach could be interesting:

- ReAttach is transdiagnostic and therefore, might reduce psychological complaints in a broad range of mental health problems.
- Since the method is mild, accessible and brief, ReAttach could already be used in an early stage to prevent mental health problems from getting worse.
- Systemic deployment of ReAttach could empower parents or partners, increasing recovery options of patients through a supportive environment.
- To tackle psychological complaints quickly, ReAttach can be offered as a training to learn to better process sensory stimuli and stress. The presentation of ReAttach as a training is less stigmatizing for patients.
- Stress tolerance and resilience become increasingly important due to global threats such as the COVID-19 pandemic and climate change. Besides reducing psychological distress, ReAttach might have the potential to foster resilience.
- Wiring Affect with ReAttach (W.A.R.A.) is an element of ReAttach that might be used as a self-regulation tool for both adults and children.
- W.A.R.A. remote therapy training is free for professionals and can be implemented very quickly in stressful times.

We have started investigating ReAttach and W.A.R.A. to better understand the effect of ReAttach and W.A.R.A. on psychological problems in children and adults. We hope that this dissertation will be a first step towards future, large scale comparative studies raising empirical evidence and answering questions about the benefit of ReAttach for specific patient groups.

Main findings and conclusions

1. What is the effect of ReAttach on Early Maladaptive Schemas?

In the first study (**chapter 2**), we assessed if ReAttach sessions could reduce active Early Maladaptive Schemas (EMSs) in adults who experience severe problems in their social relationships and acceptance of themselves and others. This research question is essential because active EMSs negatively interfere with mental health. If successful in reducing active EMSs, ReAttach might be beneficial in a broad range of adults with mental health problems since emotional dysregulation has been related to several psychiatric disorders including borderline personality disorder, generalized anxiety, post-traumatic stress disorder, substance abuse, rumination, specific phobia, and eating disorders (Barlow et al., 2004; Craske et al., 2008; Fairburn et al., 2003, 2009; Hayes et al., 2011, Leahy et al., 2011; Mennin et al., 2004; Zweig and Leahy, 2011).

ReAttach is a relatively new and uncommon intervention. The results of this study suggest that ReAttach reduces active EMSs in adults who experience problems in their social relationships and acceptance of themselves and others, even though it remains unclear whether the ReAttach actually provoked EMSs' changes. Perhaps, a reduction in psychological stress has altered the activation of the EMSs. Future research is warranted to corroborate these preliminary results in a randomized controlled trial and explore the mechanisms underlying the reduction of EMSs scores. The sample included participants with heterogeneous symptomatology. The use of additional psychological assessments besides the YSQ3, for instance, the Young Compensation Inventory (Young, 2014), would have made this study's design stronger.

Nevertheless, it would be interesting for schema therapists to explore whether ReAttach combined with schema therapy could shorten the duration of treatment or enhance the results.

2. What is the effect of ReAttach on emotional and behavioral problems of children ?

In the second study (**chapter 3**) we investigated the hypothesis that one ReAttach session for the parents and five ReAttach sessions for their children reduce emotional and behavioral symptoms of children with internalizing and externalizing mental health problems.

Since most psychiatric disorders have their origin at a young age, promoting and protecting mental health from an early age is essential (Suhrcrke, Pillas, and Selai 2008, Schmidt et al., 2020). A brief, transdiagnostic family intervention, such as ReAttach, might offer a fast relief for children's emotional and behavioral symptoms. Suppose ReAttach could be offered at secondary prevention level to families of children with psychological complaints and managed to reduce these complaints. In that case, this could reduce the pressure on youth care and waiting lists.

We found a significant reduction of emotional and behavioral symptoms measured by mean CBCL total score after ReAttach compared to those before intervention. It remains to be clarified if these positive behavioral changes measured with the CBCL are fundamental changes in the behavior of the children or, instead, differences in the cognitive biases of the parents who filled in the CBCL-forms. The child's problematic behavior measured at baseline is likely related to parents' EMSs at baseline (Martin et al., 2019; Barroso et al., 2018; Hartley et al., 2018; van Wijk-Herbrink et al., 2018; Knafl et al., 2017; Le et al. 2017). Besides, children's psychopathology is known to be strongly associated with parental stress (Barroso et al., 2018; Hartley et al., 2018; Knafl et al., 2017). The data suggest that ReAttach may improve a wide range of (sub)clinical symptomatology of children. Although the results are promising, this study raises many questions about the underlying mechanisms responsible for this effect. Unfortunately, we did not separately assess the impact of the parental sessions, for instance, by randomization to a family (with parents) or children (without parents) group. The results of this study suggest that ReAttach could have the potential of a brief family intervention supporting parents and children. However, future larger studies need to study this further.

3. Could ReAttach benefit individuals with Autism Spectrum Disorder?

The following study (**chapter 4**) investigated the effect of ReAttach on problems in daily life functioning of children and adults with Autism Spectrum Disorder (ASD). ASD represents a group of developmental disabilities characterized by impairments in social interaction and communication and restricted and repetitive interests/behaviors. These core symptoms of ASD are present from early childhood, impair or limit everyday functioning, are heterogeneous in terms of complexity and severity, and vary over time (American Psychiatric Association, 2013). If ReAttach could reduce problems of everyday functioning in individuals with ASD, this would improve their wellbeing and perhaps their development and personal growth.

The results of this study support the hypothesis that ReAttach reduces problems in everyday functioning of individuals with ASD. However, a selection bias has probably clouded the data since a selected group of ReAttach therapists, with autism expertise and enthusiasm for ReAttach, provided the sessions. Giving the participants confidence and a positive expectation about the intervention's outcome might have induced a placebo effect. Since ASD is a highly heterogeneous disorder, this relatively small number of participants might have skewed the data. Independent research, longer clinical trials with larger sample size, and follow-up data are required to confirm that ReAttach effectively reduces problems in the daily life functioning of individuals with ASD.

Since proximity of the therapist and physical touch might have been confounding factors, it is important for future studies to take this into account (Yamasue et al., 2020; Geva et al., 2020, Schneiderman et al., 2012; Prescott et al., 2011; Feldman et al., 2010; Coan et al., 2006). Also, it would have been interesting to assess participants' tactile hypersensitivity and fear of closeness which both are very common in ASD.

The impact of autism spectrum disorders on the lives of the individuals affected is enormous. If ReAttach could improve the quality of life of children and adults with ASD by reducing problems in daily functioning, ReAttach would be a welcome addition to the current range of treatment and life course guidance. Although the evidence is premature, this explorative study has shown interesting results for ReAttach as a potential multimodal approach to improve the daily life functioning of individuals with ASD.

4. Is the effect of Wiring Affect with ReAttach on negative affect larger than the effect of Distraction?

As described in **chapter 5**, we explored the effect on negative affect of Wiring Affect with ReAttach (W.A.R.A.): a stand-alone exercise used by ReAttach therapists to help patients with chronic pain or emotional dysregulation. Made up of ReAttach components, W.A.R.A. can be used as a brief, separate exercise as well as an integrated part of a regular ReAttach session. In this pilot study we aimed to investigate the efficacy of W.A.R.A. on negative affect versus distraction in a heterogeneous group of adult participants with diverse psychological problems. Investigation on the effectiveness of W.A.R.A. might contribute to the wellbeing of individuals with mental health problems, since negative affective states influence the individual's physical, cognitive,

emotional, and behavioral functioning (Aldao, 2010; Espeleta, 2019; Weiss, 2019).

First, we evaluated the effect of W.A.R.A. on negative affect and detected a significant reduction of negative affect after W.A.R.A. intervention. Subsequently, after comparing the effect of W.A.R.A. on negative affect with the effect of distraction, we noted W.A.R.A. was significantly more effective than distraction.

Unfortunately, the study design is responsible for some methodological problems. First of all, we conceptualized negative affect as "unpleasant feeling" and rated the intensity of unpleasantness with a Numeric Rating Scale. The conceptualization of negative affect in unpleasantness raises questions about the reliability and content validity of the Numeric Rating Scale. Did we really measure negative affect? This raises questions about the study's internal validity and to what degree we can conclude the efficacy of W.A.R.A. compared to Distraction. Another methodological shortcoming was that we could not detect a potential increase of negative affect when the baseline scores were high using this rating scale.

The cross-over design was not appropriate since we found multiple cases in which negative affect disappeared after W.A.R.A. and was therefore not present anymore for the second intervention. Furthermore, the study population's heterogeneity makes it challenging to interpret the study outcomes and give specific patient groups clear recommendations. If we had chosen a representative sample of participants with chronic pain or chronic emotional dysregulation, we would have gained better external validity.

Despite all these shortcomings in study design, W.A.R.A. could be an useful addition to current health care interventions. The technique is so simple that W.A.R.A. can easily be transferred as a self-regulation tool. If W.A.R.A. indeed proves to be effective in reducing negative affect, as the results suggest, the exercise could be used as (mental health) first aid and promote autonomy of adults and children with mental health problems.

5. *Is the effect of W.A.R.A. face-to-face on negative affect larger than the effect of remote W.A.R.A.?*

Additionally, (**chapter 6**) we conducted a pilot study assessing the effect of a remote version of W.A.R.A. on negative affect and comparing W.A.R.A. remote therapy with W.A.R.A. face-to-face. This research question is important, because W.A.R.A. remote therapy might be a first-aid psychological intervention in times of social restrictions and limited access to

psychological face-to-face care. W.A.R.A. remote therapy might provide our patients with a self-regulation strategy to dampen the acute stress response, which is very important in times of crises (Porges, 2020).

W.A.R.A. remote therapy provoked a significant reduction of negative affect, albeit a smaller reduction than W.A.R.A. face-to-face. The findings suggest that the online transfer of W.A.R.A. seems to lead to an inevitable loss of efficacy.

Unfortunately, we are facing the same kind of methodological problems as in the first W.A.R.A. study (**chapter 5**). First of all, we conceptualized negative affect as "unpleasant feeling" and rated the intensity of unpleasantness with a Numeric Rating Scale. Therefore, the conceptualization of negative affect in unpleasantness again raises questions about the reliability and content validity of the Numeric Rating Scale. This problem raises questions about the study's internal validity and to what degree we can conclude the efficacy of W.A.R.A. face-to-face compared to W.A.R.A. remote therapy. A second methodological problem was that we could not detect the potential increase of negative affect when the baseline scores were high using this rating scale.

In the near future, we would like to investigate the application of W.A.R.A. for specific patient groups, for instance patients with Post Traumatic Stress Disorder. Since W.A.R.A. can be applied as a self-regulation technique, more frequent practice of W.A.R.A might improve stress-resilience in vulnerable patients.

6. Could we foster resilience with ReAttach?

We conclude this thesis with a study assessing the impact of ReAttach on stress-resilience (**chapter 7**). We used the self-report Dutch Resilience Scale (Wagnild, 2008) to measure psychological distress and resilience before and after five ReAttach sessions and found a significant decrease of psychological distress and increase of stress-resilience.

The results suggest that ReAttach may be successful in improving stress-resilience and thereby might be valuable in creating favorable learning conditions for subsequent therapy.

We need more independent research with larger homogenous groups in controlled settings to assess the effect of ReAttach on resilience. It remains unclear to what extent self-reported resilience is clinically relevant for specific patient groups, such as post-traumatic stress disorder patients. We did not assess the effect of ReAttach on adaptive behavior such as pro-active coping styles and relied exclusively on self-report of participants. It would, for

instance, have provided more insight if we had measured physical stress markers.

Conclusion

This thesis' main objective was to investigate the potential of ReAttach as a transdiagnostic intervention for children and adults with mental health problems. Even though the presented study results should be interpreted with care, they appear promising and warrant further research to quantify the potential of ReAttach in alleviating health problems resulting from a broad range of psychiatric disorders. Future research should comprise comparing ReAttach with other evidence-based interventions in a randomized clinical setting. Based on our explorative studies, it is too early to draw any conclusions about mechanisms, superiority, or generalizability of ReAttach.

Reflection

ReAttach may be an accessible, affordable psychological intervention for children and adults with mental health problems. Novel, brief transdiagnostic interventions deserve high-quality, independent research including Randomized Controlled Trials as a direct result of their potential impact on mental health care. With this thesis, we hope to have planted a first seed to sprout future larger scale clinical studies.

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Appendices

Summary
Impact
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Curriculum Vitae & Publicaties
Dankwoord

Summary

The ReAttach studies presented in this thesis contribute to the practice-based evidence of ReAttach, a transdiagnostic intervention for patients with mental health problems. The next paragraphs summarize the ReAttach studies' findings and describe the steps taken from the continuous practice-based research until today.

Chapter 1 concerned a general introduction in which we positioned ReAttach within transdiagnostic psychiatry. Using literature research, we described the active ingredients that ReAttach shares with other proven effective interventions and how ReAttach distinguishes itself from these therapies. We then introduced the central research question of this thesis.

In **chapters 2 and 3**, we investigated the effect of five ReAttach sessions on dysfunctional beliefs and coping strategies of adults and children with (sub)clinical psychological problems.

In **chapter 2**, we measured dysfunctional beliefs in terms of adults' early maladaptive schemas with the Young Schema Questionnaire (YSQ3), before and after five ReAttach sessions. We found a significant reduction in total YSQ-scores in adults with a variety of psychological complaints, suggesting that ReAttach may change cognitive biases quickly. This reduction was found on all schema domains in adults with a wide range of mental health problems indicating that ReAttach might be a new form of schema therapy that needs further investigation.

In **chapter 3**, we measured the dysfunctional behavior of children with the Child Behavior Checklist (CBCL) in terms of internalizing and externalizing symptomatology of mental health problems in children. Compared to these children's baseline assessments, we found a significant reduction of all (sub)clinical scores on the CBCL after five ReAttach family-sessions. The transferability of the intervention to ReAttach child-therapists met our expectations. The data suggest that children with internalizing and externalizing behavioral problems thus with a broad variety in (sub)clinical symptomatology, may benefit from the ReAttach (family)intervention. It remained unclear if these positive behavioral changes measured with the CBCL were actual changes in the behavior of the children or, instead, differences in the cognitive biases of the parents who filled in the CBCL-forms. The impact of ReAttach on the parent-child relationship, for specific clinical groups, should be studied in more advanced design in controlled settings, including follow-up studies.

Chapter 4 describes the further exploration of ReAttach in reducing problems in daily life functioning of children and adults with Autism Spectrum Disorders (ASD). We used the Autism Treatment Evaluation Checklist (ATEC) to compare mean problem scores before and after five ReAttach sessions. We found a significant reduction of problems in daily life functioning in all subtests of the ATEC: Communication, Sociability, Sensory and Cognitive Awareness, and Health and Behavior. These findings suggest that a good transferability of ReAttach for this group of therapists and patients. But even more important: we found a symptom reduction across all ATEC domains, which supports the premise of ReAttach optimizing (pervasive) developmental conditions in individuals with ASD. Besides, we have learned from this study that patients with ASD can participate in ReAttach if only the therapist offers sufficient reassurance and predictability.

A growing interest in sensory modulation and affect regulation was the inspiration to develop W.A.R.A.: Wiring Affect with ReAttach. As described in **chapter 5**, we assessed the effect of Wiring Affect with ReAttach (W.A.R.A.) on negative affect. W.A.R.A. is a stand-alone exercise used by ReAttach therapists to help patients with chronic pain or emotional dysregulation to process negative affect. At first, we evaluated if W.A.R.A. effectively reduced negative affect, and secondly, we compared the effect of W.A.R.A. on negative affect with distraction. W.A.R.A. showed a significantly larger reduction of negative affect compared to distraction. Why W.A.R.A. is more efficient than distraction in reducing negative affect remains unclear. A possible explanation of the difference in effectivity may lie in the patient's physical contact. During W.A.R.A., there is physical contact by tapping on the hands of the patient.

Without focusing on trauma, rescripting (imagery rescripting) or neutralizing (EMDR) traumatic memories, W.A.R.A. uses associative memory formation to wire the negative affect to a group of positive concepts.

All in all, W.A.R.A. is a very gentle intervention, without exposure, and therefore more accessible than either imaginary rescripting or EMDR. Also, W.A.R.A. can easily be applied to patients who have no idea what causes their negative feelings. W.A.R.A. may be an effective, accessible, and ultrafast transdiagnostic intervention reducing negative affect.

Chapter 6 describes a pilot study conducted in the context of the current COVID-19 outbreak. Due to the COVID-19 outbreak, there was an increasing demand for online psychological support without violating social restrictions. We provided free W.A.R.A. online trainings for professionals and explored the transferability of W.A.R.A. remote therapy. This study aimed to compare

W.A.R.A. remote therapy with W.A.R.A.-face-to-face provided by a therapist. We found that the W.A.R.A. remote therapy provoked a significant reduction of negative affect. However, it was less effective than face- W.A.R.A. face-to-face. The findings suggest that the online transfer of W.A.R.A. seems to lead to an inevitable loss of efficacy. W.A.R.A. remote therapy might be beneficial as a first-aid psychological intervention and self-regulation technique. However, W.A.R.A. cannot solve more severe psychopathology. The accessibility, rapid transferability, the mildness of the intervention, and the efficiency of W.A.R.A. remote therapy in decreasing negative affect are promising. Patients can learn remote W.A.R.A. as a self-regulation tool, which will enhance patients' autonomy and self-control in times of psychological distress.

In **chapter 7**, we conclude this Ph.D. trajectory with a study assessing the impact of ReAttach on stress-resilience. We used the Dutch Resilience Scale (Wagnild, 2008) as a self-report to measure resilience and the Korte Klachten Lijst (Lange and Appelo, 2007) to evaluate psychological stress. We compared the mean psychological stress and resilience scores before and after five ReAttach sessions and found a significant decrease in psychological stress and a significant increase in resilience. It remains unclear to what degree the self-reported psychological resilience was clinically relevant for specific patient groups, such as patients with post-traumatic stress disorders. Instead of exclusive reliance on patients' self-reports, biological markers could have contributed to a better understanding of the effect of ReAttach on the neurobiological mechanisms underlying resilience which requires further investigation.

Especially nowadays, in the context of the COVID-19 pandemic an accessible, mild, and rapid intervention such as ReAttach might help overcome psychological crises. The results suggest that ReAttach may be successful in improving stress-resilience and thereby valuable in creating favorable learning conditions for subsequent therapy.

In **chapter 8**, we reflect on the studies to answer this thesis's central question: Is ReAttach a suitable transdiagnostic intervention for children and adults? The ReAttach protocol simultaneously focuses on several proven transdiagnostic processes that are presented in a fixed sequence. This standard protocol, which also offers scope for individual adjustments, distinguishes ReAttach from other multimodal interventions. ReAttach appears to be suitable for a broad population of children and adults with psychological complaints, and the results of the practice-based research are promising. Nevertheless, it is still too early to draw any conclusions about causality, superiority, and generalizability.

Looking back on this thesis, we see the limitations and missed opportunities in addition to the promising results. Nevertheless, this thesis offers sufficient leads and challenges for further independent research.

Impact

At the end of this thesis, I would like to reflect on the value that the ReAttach studies described in this thesis might have for society. Researchers need to bridge the gap between science and practice to contribute to the community by putting their work at society's service.

I feel a responsibility towards society and, in particular, towards the patients and professionals who work with ReAttach. Since ReAttach has been developed in clinical practice, the connection with clinical work was there from the start. Practice-based research is necessary to test potentially effective interventions, investigate whether there are any adverse effects, make the intervention theory more explicit, and integrate practical experiences and scientific findings.

General practitioners and psychologists mainly use ReAttach in primary mental health care services and counseling. For patients with complex psychiatric disorders, ReAttach is not used as a stand-alone treatment, only in combination with psychiatric treatment. Paramedics frequently combine ReAttach with other therapies in neurorehabilitation, speech therapy, and occupational therapy settings to improve the learning conditions.

Although the scientific evidence needs to be expanded further, I would like to emphasize three critical themes that I use as guidelines for future development of ReAttach: Accessibility, Affordability and Quality.

Accessibility

Mental health is something we wish for everyone, but that is not self-evident for many. Following Fusar-Poli et al. (2020), who define good mental health as a state of well-being, allowing individuals to cope with daily life stressors and functioning productively, the COVID-19 pandemic has put global mental health under enormous pressure (Yao et al., 2020). More than ever, mental health promotion, increasing distress tolerance, and stress-resilience are essential to prevent a worldwide rise of mental health problems (Fusar-Poli et al., 2019; Shalev and Shaprio, 2020; Yao et al., 2020; Arnoudova and Amaro, 2020). ReAttach is currently available in fourteen countries, including low-income countries such as Indonesia, Malaysia, the Balkan region and India since more than 2400 ReAttach therapists are trained. As reflected by this thesis, we hope to contribute to the increase of mental health by implementing an accessible transdiagnostic intervention for children and adults with mental health problems across the world.

Affordability

The cost-effectiveness of ReAttach and W.A.R.A. has not yet been scientifically researched. Nevertheless, I hope to contribute to affordable mental health care with these brief interventions. As shown in the ReAttach studies of this thesis (chapters 2,3,4 and 7), mental health might be promoted in a short period of five ReAttach sessions. The ultra-fast W.A.R.A. intervention might be used to relieve negative affect. W.A.R.A. online training for therapists is free and available for professionals from all over the world (Weerkamp-Bartholomeus et al., 2020).

In 2018, we have founded an open access, peer-reviewed scientific journal with an independent editor in chief and independent editorial board: Journal for ReAttach Therapy and Developmental Diversities. JRTDD does not demand publication costs or article processing fees.

Quality

My motivation to start this Ph.D. trajectory reflects my wish for participation in or initiation of scientific research. ReAttach Therapy International Foundation's establishment as a responsible non-profit organization for the quality assessment of ReAttach Training Courses has also contributed to quality objectives. Evaluation of the transfer of a ReAttach and W.A.R.A. to the next generation of therapists and evaluation of training courses are necessary steps for quality implementation in clinical practice.

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Nederlandse Samenvatting

De ReAttach-studies die in dit proefschrift worden gepresenteerd, beogen bij te dragen aan de bewijskracht voor ReAttach als transdiagnostische interventie voor kinderen en volwassenen met psychische problemen. De volgende paragrafen vatten de bevindingen van de ReAttach-studies samen en beschrijven de stappen die tot op heden zijn genomen.

Hoofdstuk 1 betrof een algemene introductie waarin we ReAttach positioneerden binnen de transdiagnostische psychiatrie. Aan de hand van literatuuronderzoek beschreven we de werkzame ingrediënten die ReAttach deelt met andere, bewezen effectieve interventies en op welke manier ReAttach zich van deze therapieën onderscheidt. Vervolgens introduceerden we de centrale onderzoeksvraag van deze thesis.

In **hoofdstuk 2 en 3** onderzochten we het effect van vijf ReAttach-sessies op disfunctionele overtuigingen en coping-strategieën van volwassenen en kinderen met (sub)klinische psychische problemen.

In **hoofdstuk 2** onderzochten we disfunctionele overtuigingen van volwassenen met diverse psychologische klachten middels de Young Schema Questionnaire (YSQ3), voor en na vijf ReAttach-sessies. We vonden een significante afname van de totale YSQ-score, wat suggereert dat ReAttach disfunctionele overtuigingen snel kan veranderen. Deze vermindering werd gevonden bij volwassenen met uiteenlopende psychologische problematiek, op alle schemadomeinen, wat de hypothese ondersteunt dat ReAttach een transdiagnostische nieuwe vorm van schematherapie zou kunnen zijn.

In **hoofdstuk 3** onderzochten wij de invloed van ReAttach op internaliserende en externaliserende gedragsproblematiek bij kinderen met de Child Behavior Checklist (CBCL). Vergeleken met de meting voor het ReAttach traject, vonden we significante afnames van alle (sub)klinische scores op de CBCL na vijf ReAttach sessies voor de ouders en het kind. De overdracht van de therapie op kindertherapeuten voldeed aan onze verwachtingen. ReAttach zou als gezinstherapie met goed resultaat kunnen worden ingezet bij kinderen met internaliserende en externaliserende gedragsproblemen. Het blijft onduidelijk of de positieve gedragsveranderingen die we gemeten hebben met de CBCL feitelijke veranderingen in het gedrag van de kinderen waren. Omdat de vragenlijsten door de ouders zijn ingevuld, zou het mogelijk kunnen zijn dat we juist een verandering in het denken van de ouders over hun kind hebben gezien. We willen graag de impact van ReAttach op de ouder-kindrelatie, en voor specifieke klinische groepen in de toekomst verder bestuderen.

Hoofdstuk 4 beschrijft de verdere verkenning van ReAttach om problemen in het dagelijks functioneren van mensen met autismespectrumstoornissen (ASD) te verminderen. We gebruikten de Autism Treatment Evaluation Checklist (ATEC) om gemiddelde probleemscores voor en na vijf ReAttach-sessies te vergelijken. We vonden een significante vermindering van problemen in het dagelijks functioneren bij alle subtests van de ATEC: communicatie, sociaal, sensorisch, cognitief bewustzijn, gezondheid en gedrag. De vermindering van problemen in alle ATEC-domeinen, ondersteunt de hypothese dat ReAttach meerdere transdiagnostische processen tegelijkertijd kan optimaliseren bij personen met ASD. Bovendien hebben we uit deze studie geleerd dat ReAttach voldoende toegankelijk is voor mensen met ASD.

Hoofdstuk 5 gaat over Wiring Affect with ReAttach (W.A.R.A.). Dit is een op zichzelf staande oefening die door ReAttach-therapeuten wordt gebruikt om patiënten met chronische pijn of emotionele onregeling te helpen bij het verwerken van negatief affect. Eerst onderzochten we het effect van W.A.R.A. op negatieve affect. Daarna keken we of W.A.R.A. negatieve gevoelens sterker zou verminderen dan afleiding. Het effect van W.A.R.A. op negatief affect was inderdaad groter dan afleiding. Een mogelijke verklaring voor dit verschil kan liggen in het fysieke contact van met de patiënt. Tijdens WARA is er lichamelijk contact door op de handen van de patiënt te tikken. Zonder exposure om traumatische herinneringen te veranderen (rescripting van beelden) of te neutraliseren (EMDR), gebruikt W.A.R.A. associatieve geheugenvorming om het negatieve affect te verbinden aan een groep positieve concepten.

Al met al lijkt W.A.R.A. een hele milde interventie, zonder exposure en daarom toegankelijker dan imaginair rescripting of EMDR. Bovendien kan W.A.R.A. kan gemakkelijk worden toegepast bij patiënten die geen idee hebben wat hun negatieve gevoelens veroorzaakt. W.A.R.A. kan een effectieve, toegankelijke en ultrasnelle transdiagnostische interventie zijn om nare gevoelens te verminderen.

Hoofdstuk 6 beschrijft een pilotstudie die is uitgevoerd in de context van de COVID-19-pandemie. Door de uitbraak van COVID-19 was er een toenemende vraag naar online psychologische ondersteuning zonder de opgelegde sociale beperkingen te schenden. Om tegemoet te komen aan deze vraag hebben we gratis W.A.R.A. remote therapy trainingen aangeboden aan professionals. In deze studie onderzochten we de effectiviteit van W.A.R.A. remote therapy op het reduceren van negatief affect en vergeleken de effectiviteit met W.A.R.A. face-to-face.

W.A.R.A. remote therapie resulteerde in het verminderen van negatieve gevoelens. Echter, de op afstand aangeboden W.A.R.A. was minder effectief dan W.A.R.A. face-to-face.

De online overdracht van W.A.R.A. lijkt te leiden tot een verminderde werkzaamheid van de interventie. W.A.R.A. remote therapie kan zinvol worden ingezet als een eerste hulp psychologische interventie en als zelfregulatie oefening om nare gevoelens te kunnen hanteren. Voor het behandelen van ernstige psychopathologie is W.A.R.A. niet bedoeld.

De toegankelijkheid, snelle overdraagbaarheid, de mildheid en efficiëntie bij het verminderen van negatief affect van W.A.R.A. remote therapie zijn veelbelovend. Het op afstand kunnen inzetten van W.A.R.A. als een zelfregulatie oefening zou de autonomie en zelfbeheersing van patiënten kunnen vergroten in tijden van psychische nood.

In **hoofdstuk 7** ronden we dit promotie traject af met een onderzoek naar de impact van ReAttach op stressbestendigheid. We gebruikten de Nederlandse Resilience Scale (Wagnild, 2008) als zelfrapportage om veerkracht te meten en de Korte Klachten Lijst (Lange en Appelo, 2007) voor de evaluatie van psychologische stress. Vergelijking van de psychologisch stress en veerkrachtscores voor en na vijf ReAttach sessies liet een significante afname van psychologisch stress en significante toename van veerkracht zien. Binnen de huidige context van de COVID-19-pandemie zou een toegankelijke, milde en snelle interventie zoals ReAttach kunnen helpen bij het overwinnen van acute psychologische stress. ReAttach zou succesvol kunnen zijn in het verbeteren van stressbestendigheid en daardoor waardevol in het creëren van gunstige omstandigheden voor aansluitende psychotherapie. Verder onderzoek in deze richting is een mooie uitdaging.

In **hoofdstuk 8** reflecteren we op de onderzoeken om de hoofdvraag van deze thesis te kunnen beantwoorden: Is ReAttach een geschikte transdiagnostische interventie voor kinderen en volwassenen? Het ReAttach protocol richt zich tegelijkertijd op meerdere bewezen transdiagnostische processen die in een vaste volgorde worden aangeboden. Dit standaard protocol dat tevens ruimte biedt om individuele aanpassingen te doen onderscheidt ReAttach van andere multimodale interventies. ReAttach lijkt geschikt voor een brede populatie kinderen en volwassenen met psychische klachten en de resultaten van het praktijk gestuurde onderzoek zijn veelbelovend. Desondanks is het nog te vroeg om conclusies te trekken omtrent causaliteit, superioriteit en generaliseerbaarheid.

Terugkijkend op deze thesis zien we naast de veelbelovende resultaten ook beperkingen en gemiste kansen. Desalniettemin, deze thesis biedt voldoende

aanknopingsmogelijkheden en uitdagingen voor verder onafhankelijk onderzoek in de nabije toekomst.

Curriculum Vitae en Publicaties

Paula Bartholomeus is geboren op 8 januari 1966 in Westerhoven. In 1984 behaalde zij haar gymnasiumdiploma aan het Hertog Jan College te Valkenswaard, waarna zij startte met de opleiding HBO-Jeugdwelzijnswerk. Na het eerste jaar HBO-J maakte Paula de overstap naar Rijksuniversiteit Utrecht waar zij in 1989 het doctoraalexamen in de pedagogische wetenschappen heeft afgelegd met de differentiatie orthopedagogiek-zwakzinnigenzorg. Ze combineerde haar studie met vrijwilligerswerk bij Buurthuis De Wilg in Utrecht, een organisatie ter ondersteuning van mensen met een verstandelijke beperking.

In 1996 startte Paula een orthopedagogische praktijk waarbij ze zich, in nauwe samenwerking met kinder- en jeugdpsychiatrische voorzieningen in de regio, richtte op de diagnostiek en behandeling van kinderen en jeugdigen met complexe ontwikkelingsvraagstukken. In diezelfde periode werkte zij als orthopedagoog binnen het Praktijkonderwijs.

ReAttach is ontwikkeld vanuit deze orthopedagogische praktijk, die zij net als haar functie binnen het Praktijkonderwijs in 2011 heeft beëindigd om zich volledig te kunnen gaan richten op ReAttach.

In 2013 reisde Paula naar Boekarest om bij Napocencis Medical Centre ReAttach workshops aan te bieden en vrijwillig te werken met kinderen met autisme en een verstandelijke beperking. In de jaren daarna verzorgde ze ook gratis workshops en ReAttach sessies bij Action for Aspergers Charity in Peterborough (UK), en in India bij de Ashish Foundation en Psy Uni Trust in New Delhi, Amaze Charitable Trust in Coimbatore en Velvi Organization in Madurai. In 2014 werkte ze mee aan een project van met WIJZ Buurtzorg in Zwolle om dementerenden en hun mantelzorgers ReAttach te laten ervaren.

In 2016 werd Stichting ReAttach Therapy International opgericht als non-profit organisatie die zich bezighoudt met de internationale implementatie van ReAttach en de kwaliteitsbewaking van ReAttach opleidingen. Deze stichting beheert het kwaliteitsregister, is de uitgever van de opleidingsmaterialen en de oprichter van Journal for ReAttach Therapy and Developmental Diversities (JRTDD). In 2018 werd het eerste ReAttach Congres gehouden in Eindhoven en in 2020 was het congres gepland in Skopje, Macedonië. Vanwege de COVID-19 pandemie is het congres in Skopje omgezet naar een internationale online conferentie met als thema “embracing complexity”. In mei 2019 startte Paula het promotietraject bij prof. Thérèse van Amelsvoort, prof. Michael

Fitzgerald en prof. Donatella Marazziti, wat heeft geresulteerd tot dit proefschrift.

Paula Bartholomeus was born on January 8, 1966, in Westerhoven. In 1984 she obtained her gymnasium diploma at the Hertog Jan College in Valkenswaard, after which she started the HBO-J. After the first year of HBO-Youth Social Work Paula transferred to the University of Utrecht. She completed her master's degree in pedagogical sciences in 1989 with differentiation for the developmentally disabled. She combined her studies volunteering at Buurthuis De Wilg in Utrecht, an organization supporting people with intellectual disabilities.

In 1996, Paula started a private practice. In close collaboration with the region's child and youth psychiatric facilities, she assessed children and adolescents with complex developmental problems. Simultaneously, she worked as an educational psychologist at a school for adolescents with cognitive disabilities. She developed ReAttach in her private practice, which she, just like her position within school, ended in 2011 to entirely focus on ReAttach.

In 2013, Paula provided ReAttach workshops at Napocensis in Bucharest, where she worked with children with autism and intellectual disabilities. In the following years, she delivered free training and ReAttach sessions at Action for Aspergers Charity in Peterborough (UK) and India: at the Ashish Foundation and Psy Uni Trust in New Delhi, Amaze Charitable Trust in Coimbatore, and Velvi Organization in Madurai. In 2014 she participated in a pilot of WIJZ Buurtzorg in Zwolle and worked with individuals with dementia. In 2016, ReAttach Therapy International Foundation was founded as a non-profit organization focusing on the international implementation of ReAttach and the quality assurance of ReAttach training. The ReAttach foundation manages the quality register, publishes the training materials, and became the founder of the Journal for ReAttach Therapy and Developmental Diversities (JRTDD). The first ReAttach Congress was organized in Eindhoven in 2018. In 2020 the ReAttach conference was planned in Skopje, Macedonia, and hosted by the Macedonian Scientific Society for Autism. Due to the COVID-19 pandemic, the meeting was held online. The conference theme was "embracing complexity." In May 2019, Paula started her Ph.D. supervised by prof. Thérèse van Amelsvoort, prof. Michael Fitzgerald, and prof. Donatella Marazziti which resulted in this thesis.

List of presentations

Autism Conference Den Bosch, 2014
Hersenletsel Congres, Arnhem, 2014
World Autism Organization Conference, Kuwait 2014
European Conference for Mental Health, Riga 2015
Universiteit St. Cyril and Methodius, Skopje, 2015
Autism Conference, Eindhoven, 2015
Autism Solutions Conference Moscow, 2016
World Autism Organization Conference Denmark, 2016
Rehabilitation Conference Moscow, 2016
Psychotherapy Conference, Kuala Lumpur, 2018
ReAttach Conference Eindhoven, 2018
World Autism Organization Conference, Houston Texas, 2018
ReAttach Mini-Symposium, Voerendaal 2019
ReAttach Conference, Voerendaal 2020
World Autism Conference, Prishtina 2020

List of publications

Weerkamp-Bartholomeus, P. (2015). ReAttach: The exciting development of a promising intervention for Autism Spectrum Disorder. In M. Fitzgerald, Autism Spectrum Disorder – Recent Advances (doi:10.5772/60462). Intech Open.

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Donatella Marazziti heeft mij geïnspireerd vanuit haar kritische rol als editor-in-chief bij Clinical Neuropsychiatry. Ik ben dankbaar voor haar betrokkenheid bij ReAttach, haar bijdrage aan het E-book over ReAttach voor autisme en haar inspirerende bijdragen op het ReAttach congres in 2018 en 2020.

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