

ReAttach and Neuroplasticity in Parkinson's Disease: A Message to The Control Room

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Abstract

This paper delves into the potential of ReAttach as an intervention for Parkinson's Disease, a neurodegenerative disorder characterized by a decrease in brain connectivity and movement disorders [1]. The brain's ability to rewire itself presents promising opportunities for neuro-rehabilitation [2]. Various factors, including age, experience, learning, genetic factors, physical health, exercise, diet, sleep, and age, influence the extent of this rewiring [3]. The role of new learning activities in stimulating neuroplasticity cannot be overstated. These activities trigger complex molecular events associated with long-term potentiation, strengthening synaptic connections between neurons [1,4]. ReAttach is a transdiagnostic intervention for children and adults with psychological or psychosomatic problems, including neurodegenerative disorders. ReAttach focuses on optimizing arousal, stimulus processing, and learning dynamics while also activating secure attachment patterns and fostering a Growth Mindset [5,6,7]. Numerous studies have highlighted the benefits of physical exercise for individuals with Parkinson's Disease [10, 11, 12]. Exercise is undeniably beneficial for patients with PD, combating both motor and non-motor symptoms by affecting various aspects of the disease, from the dopaminergic synapse to central nervous system perfusion. Additionally, physical exercise helps build strength to compensate for age-related frailty and motor decline [10]. Authors assess how ReAttach techniques, in combination with physical exercises, help patients with Parkinson's Disease harness the neuroplasticity of their brain. This single-case study is the first publication on the application of ReAttach in patients with Parkinson's Disease. The results are part of a pilot study that will also be published shortly.

Keywords: Parkinson's Disease, ReAttach, W.A.R.A., Dance Therapy

Introduction

Parkinson's disease (PD) is characterized by motor and non-motor symptoms such as mood, cognition, behavior, sleep, autonomic function, and sensory systems [Goldman, 2025]. A combination of therapies that aim to reduce both motor and non-motor symptoms provided that they reinforce each other, might be of extra value for this group of patients. We hypothesize that patients with PD will benefit more than expected when we first enhance the learning dynamics with ReAttach and then immediately offer physical and cognitive exercises: new learning experiences.

According the main topic of this research and previous investigators Kalia and Lang (2015), and likewise Weerkamp-

Bartholomeus (2018) knowledge, the PD assumed as a progressive neurodegenerative disorder characterized by motor symptoms such as tremor, rigidity, and bradykinesia, as well as non-motor symptoms including cognitive impairment, mood disorders, and sensory disturbances. Traditional interventions primarily focus on dopaminergic medications and physical therapy to manage motor symptoms. However, emerging therapeutic approaches, such as ReAttach, aim to address the emotional and cognitive dysregulation frequently observed in PD. In addition, ReAttach is determined as a short-term, multisensory intervention designed to promote cognitive and emotional integration through structured stimulation of the sensory system, affective engagement, and cognitive activation. Although originally developed for neurodevelopmental and stress-related conditions, ReAttach is being explored as a complementary therapy in neurodegenerative disorders,

including PD, due to its potential to enhance emotional regulation, reduce anxiety, and support adaptive functioning. In continue, a single case has been studied with more details [14, 15]

Single case study: a message to the control room

T. is a 70-year-old man diagnosed with PD five years ago, currently in PD stage three, based on the fact that he lives at home but requires care. He utilizes medical aids, including a walker, informal care for medication intake, and the provision of food and drink. T. can still dress himself and walk a familiar route. He can also still find something he lost. However, he cannot remember his actions. T. has undergone an operation to apply neurostimulation to reduce the tremors. He also visits Switch2move at the care farm twice a week and receives physiotherapy once a week.

ReAttach, Cognitive Training, Mirror Training, and Dance!

ReAttach, cognitive exercises and mirror training were conducted once a week before the dance class, led by Andrew Greenwood, an international dancer and dance teacher specializing in neurological movement disorders. The therapist's goal was first to improve stimulus processing and learning conditions using ReAttach, mirror training and subsequently offer cognitive and physical challenges, including dance. T. received five complete ReAttach sessions to stimulate the mirror neuron system and sensory processing and improve cognitive functioning through social cognitive training and cognitive bias modification [5]. The therapist structured the program with the same start, pickup, and welcome, asking the same questions before all sessions, each lasting fifteen minutes, and asking the same questions after each session.

Descriptive results

Initially, full ReAttach sessions were too long for T., with no immediate improvement in speech but noticeable progress in gross motor skills. However, Wiring Affect with ReAttach (W.A.R.A.) [6] proved to be very accessible to T., provided the therapist allowed sufficient time for the switch. Besides the improvement of gross motor skills, T. noticed that his sleep improved dramatically, transitioning from poor to deep sleep.

T.'s functioning was assessed by the therapist across various domains on a 4-point scale, ranging from 0 (nothing/minimal) to 4 (good). Compared to the start of the program, the therapist observed the following positive changes afterwards: Working memory (1 - 3); Sleep (1 - 4); Response time (1 - 4); Speech (1 - 3); Gross motor skills (1 - 4); Fine motor skills (2.5 - 3); Left eye-opening (1 - 3). Compared to before the program, no negative changes were found.

The positive change in **gross motor skills** manifested itself as

follows: Before the program, T. could move one hand and one leg on the same side. After the program, T. could move both legs and arms in symmetry, asymmetry, and alternating motion. T. can move freely from the chair during dance class without support. Light support unipedal.

Before the program, it was tough to understand T. due to his **speech** problems, and T. did not initiate much communication. After the program, T. showed more **spontaneous initiative** and enjoyed conversation, with his speech becoming significantly more intelligible.

Therapist narrative:

T. is an intelligent man; when I work with him, and the stress of answering well disappears, he becomes a lot calmer. Since the combined program, his speech has improved; his pronunciation is much clearer. He talks faster. Additionally, the response time and switching activities are enhanced. In session number 4, he moved both legs; he stood up and danced immediately for the first fifteen minutes. Usually, he could only tap with one hand or one leg, but now he does everything with the dance lesson, using both his left and right legs, moving from left to right; it's incredible to see.

Discussion

In this single case study, we describe the results of ReAttach in combination with mirror training and dance therapy in a 70-year-old male with stage three Parkinson's Disease. We hypothesize that we can use ReAttach as a catalyst to boost neuroplasticity in a stimulating and activating learning environment. We recognize that this is a single case. Nevertheless, we do observe striking and significant improvements in multiple domains in a patient with a neurodegenerative disorder, including working memory, sleep, response time, speech, gross motor skills, fine motor skills, and social involvement and participation.

The results suggest that there is much to gain in terms of quality of life for patients with PD and that ReAttach might play a key role in improving learning conditions. Since ReAttach is a gentle, non-invasive intervention that can be tailored to the individual's developmental phase, it may be an accessible addition to current treatment programs.

In a follow-up study, it will be interesting to include the Forgive and Forget Hood. This brief ReAttach intervention appears to offer real added value for patients with PD; after all, in the pilot study with Q-EEG analysis, we observed that in all patients, the right hemisphere began to function more effectively [13]. The Forgive and Forget Hood is an accessible exercise because it is brief and straightforward. Given the improvements noted in the previous research [13], it may be an excellent addition for patients with PD.

In general, this case study highlights the potential benefits of a multidisciplinary, integrative intervention for individuals with mid-stage PD by focusing on a 70-year-old man (T.) in stage three of the condition. T. The program incorporated ReAttach

therapy, cognitive training, mirror therapy, and neurologically-informed dance, reflecting a progressive model that addresses the complex interplay of motor, cognitive, emotional, and social deficits characteristic of PD. T.'s initial symptoms included impaired memory recall, limited motor coordination, disrupted sleep, and significant speech difficulties. Despite undergoing deep brain stimulation to control tremors and maintaining weekly physiotherapy, these symptoms persisted, impacting his autonomy and communication. The structured therapeutic framework—beginning with ReAttach, followed by cognitive and mirror training, and culminating in expressive movement through dance—was designed to first optimize stimulus processing and social-emotional regulation. ReAttach, particularly its Wiring Affect with ReAttach (W.A.R.A.) modality, played a pivotal role in enabling T. to better engage with subsequent physical and cognitive tasks. By stimulating the mirror neuron system and promoting affect regulation, ReAttach may have primed neural circuits responsible for sensorimotor integration, social cognition, and executive functioning—key domains frequently disrupted in PD. Objective therapist assessments post-intervention revealed marked improvements across multiple domains: working memory, sleep quality, motor coordination, response time, speech, and even facial motor control (e.g., left eye opening). Notably, gross motor improvements were not just clinically relevant but translated into meaningful real-world abilities—T. could now dance freely, alternate limb movements, and participate in group activities with greater spontaneity and coordination. The emergence of speech clarity, faster response time, and increased verbal initiative further suggests that beyond motor enhancement, the intervention promoted psychosocial engagement and cognitive activation. The therapist's qualitative observations of reduced performance anxiety, increased calmness, and improved task-switching reinforce this interpretation, aligning with literature that emphasizes the role of emotion regulation and environmental predictability in facilitating learning and adaptation in PD [16]. Overall, this study approach appears to mitigate both motor and non-motor symptoms by addressing underlying sensory, emotional, and cognitive dysfunctions rather than focusing solely on physical rehabilitation.

Conclusion

This single case study demonstrates that ReAttach and W.A.R.A. may play a crucial role in enhancing the learning conditions of patients with Parkinson's disease. Although further research is warranted on the use of ReAttach as a catalyst to boost treatment programs, the results of individual patients, such as T., are encouraging.

By reviewing all the mentioned details this case study demonstrates that a multimodal, neuro-integrative intervention—centered around ReAttach therapy and incorporating mirror training, cognitive tasks, and expressive movement—can substantially enhance the quality of life

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in individuals with Parkinson's disease, even in advanced stages. T.'s progression from limited limb movement and poor communication to coordinated dancing and spontaneous speech highlights the transformative potential of combining sensorimotor stimulation, cognitive training, and embodied practices like dance.

While further research is needed to generalize these findings, especially through controlled trials, the positive outcomes in this case affirm that targeting the emotional-cognitive-motor interface may yield robust improvements in both functional capacity and psychosocial well-being in PD. Holistic approaches like this may represent a valuable complement to pharmacological and surgical treatments, offering a more person-centered and empowering path to living well with Parkinson's.

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Declaration of interest

Paula Zeestraten-Bartholomeus is the developer of ReAttach and W.A.R.A.

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