ReAttach Affect Coach
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Blended insights from the ReAttach M.I.S.T. and Emotional Symptom Regulation Model (ESRM)

Painter S[1,*], Zeestraten-Bartholomeus P[2], Bita M[3], and Mehrad A[3]

[1]Steven Painter, Neurolog, United Kingdom
[2]Dr. Paula Zeestraten-Bartholomeus, ReAttach Academy, The Netherlands

[3]Mohadeseh Bita, Ph.D student, Bu-Ali Sina University, Hamedan, Iran
[4]Prof. Dr. Aida Mehrad, Universitat Internacional de Catalunya, Barcelona, Spain

*Corresponding author: Steven Painter, Neurolog, United Kingdom, Email: steven@neurolog.app

Abstract

Objective: Recent extensive digital phenotyping studies in Functional Neurological Disorder (FND) have uncovered seven unique clusters of emotional states, which challenge the conventional binary view of distress and resilience [1]. The current study intends to create a clinical framework driven by theory and aimed at generating hypotheses that connect these emotional state clusters to the transdiagnostic mechanisms of ReAttach therapy and its diagnostic interview, the Mapping the Individual State of Mind (M.I.S.T.) [3,7].

Method: The researchers performed a conceptual integration of data on digital emotional phenotyping in FND [1] with both empirical and theoretical literature regarding ReAttach therapy [3], W.A.R.A. (Wiring Affect with ReAttach) [4–6,16], and the M.I.S.T. framework [7]. This integration concentrated on arousal regulation, sensory integration, affect wiring, modification of cognitive biases, and processing of social rewards. Evidence from pilot studies, small-scale randomized trials, and protocol-based investigations was used to support the proposed clinical linkages [4,5,16].

Results: The study result has been structured as a clinical mapping model that connects the seven emotional state clusters in FND (Distress, Shutdown, Activation, Anger, Social Isolation, Resilience, and Ambivalence) to specific transdiagnostic intervention strategies. Initial findings from pilot studies and small randomized comparisons indicate that ReAttach-based interventions may decrease the intensity and duration of negative affect, enhance emotional regulation, and improve therapeutic engagement in patients who have difficulties with standard top-down approaches [3–6]. Specifically, W.A.R.A. has shown to be more effective in the short term for reducing negative affect compared to distraction techniques in randomized pilot studies, with positive effects seen in both in-person and remote delivery settings [5,16]. Further observational and protocol-based studies suggest enhancements in emotional regulation, perceived control, and resilience across a variety of psychobiosocial conditions [8,9,31].

Conclusions: The study does not assert clinical efficacy but offers a theoretically sound and neurobiologically plausible framework for customizing psychological interventions in FND based on an individual's mental state. The combination of emotional state phenotyping with the M.I.S.T. framework presents a structured hypothesis foundation for upcoming controlled trials and precision-oriented treatment development in FND and other related psychobiosocial conditions [27,29].

Keywords: ReAttach, M.I.S.T., W.A.R.A., Forgive and Forget Hood, Functional Neurological Disorder, Emotional Symptom Regulation Model (ESRM).

Introduction

The concept of Functional Neurological Disorder (FND) is currently undergoing a paradigm shift, moving towards a multimodal, biopsychosocial understanding of symptom network disorders [1,2]. FND, which was previously termed conversion disorder, has been plagued by binary categorizations that simplified the patient experience to either "distressed" or "resilient". Although this might be helpful for assigning treatment protocols, simplification fails to capture the disorder's multidimensional nature and thus neglects significant gaps in care for patients with complex symptomatology. The first problem is that this categorization does not cover the complex neurobiological states of patients who do not fit the typical profile of overt anxiety, such as those exhibiting profound emotional shutdown or paradoxical high-energy states [1]. The

second problem of this reduction is that by focusing mainly on the patient, the researchers neglect the systemic co-regulation by significant others. The researchers of the study tend to neglect the influence of the social environment, including the therapist's role in shaping the patient's individual state of mind, which fluctuates throughout the day and across different circumstances [11,12]. In the recent publication of these researchers large-scale digital phenotyping has revealed seven distinct emotional phenotypes within the FND population [1]. These researchers found emotional phenotype clusters that range from the hyper-aroused "Distress" and "Anger" groups to the hypo-aroused "Shutdown" and "Social Isolation" groups. These findings emphasize the need for a multimodal tailored intervention, such as ReAttach [3].

Cognitive Behavioral Therapy (CBT) continues to be a suggested psychological treatment for FND and has shown benefits for certain patients, especially those with sufficient cognitive flexibility and emotional awareness [34,35]. However, increasing evidence points out that CBT does not work uniformly well across the diverse FND population. Various studies suggest that CBT methods that primarily depend on top-down cognitive control may be less accessible or effective during periods of extreme hyperarousal or hypoarousal, when executive functions, attention, and emotion regulation are compromised [13,14,34].

For instance, patients who are experiencing high levels of anxiety or threat-related hyperarousal may display diminished prefrontal inhibition and heightened limbic responsiveness, which limits their ability to engage in cognitive reappraisal when symptoms worsen [15,34]. In contrast, patients who present with dissociative or hypoaroused states frequently describe experiencing "brain fog," emotional numbness, or diminished mental clarity, making it challenging to access cognitively intensive interventions or leading to premature exhaustion [19,30]. These limitations that are dependent on the current state are increasingly recognized in both neurological and psychiatric research, emphasizing the necessity for interventions that can adjust to changes in arousal and information processing abilities [28,35].

Clarifying Key Phenomena: Emotiona

l Shutdown and Paradoxical

High-Energy States

In the context of FND, digital phenotyping has uncovered emotional profiles that diverge from traditional classifications of anxiety and depression [1]. Two notably underappreciated manifestations within this population are emotional shutdown and paradoxical high-energy states.

In addition Emotional Shutdown is characterized by a hyper-aroused state, where patients exhibit emotional numbness, diminished subjective feeling intensity, reduced social engagement, and cognitive slowing. Clinically, individuals may describe feelings of being "empty," "detached," or "switched off," even when physical symptoms persist. For instance, a patient

presenting with functional weakness might report minimal emotional distress regarding their condition but simultaneously display significant withdrawal, low initiative, and a restricted ability to reflect on their internal states. This phenomenon aligns with the dorsal vagal immobilization states outlined in modern neurobiological frameworks of stress and dissociation [19,28,30].

In contrast, "Paradoxical High-Energy States" feature a simultaneous increase in physiological arousal and subjective energy, frequently accompanied by anxiety, restlessness, or nervous excitement. Patients in this state may project a façade of high functionality, motivation, or even euphoria, yet struggle with poor interoceptive awareness and a propensity for overexertion. A representative clinical scenario involves a patient who undertakes excessive activities during moments of perceived wellness, only to subsequently encounter abrupt symptom exacerbation or physical collapse— a clinical pattern often referred to as "boom–bust" functioning. Such paradoxical activation can obscure underlying dysregulation and hinder timely help-seeking or engagement with treatment modalities [1,22]

Rationale for State-Sensitive
Interventions

The diverse emotional and arousal profiles observed in FND indicate that a universal therapeutic strategy may be inadequate. Likewise CBT can be effective for patients operating within a moderate window of tolerance; however, individuals with more severe dysregulation may require alternative or adjunctive interventions that facilitate access to cognitive strategies [34,35]. Bottom-up modalities that focus on arousal regulation, sensory integration, and affective processing may be crucial entry points for therapeutic engagement, particularly when top-down cognitive functionalities are impaired [3,27,28].

ReAttach therapy emerges as a transdiagnostic intervention aimed at enhancing arousal modulation, sensory processing, and optimal learning conditions prior to engaging in cognitive restructuring [3]. Preliminary data from pilot and small-scale studies indicate that techniques derived from ReAttach, such as W.A.R.A. may effectively mitigate the intensity of negative affect, improve emotional regulation, and foster engagement among patients who find traditional cognitive approaches challenging, especially during periods of fluctuating arousal states[4, 6, 16]. It is important to note that these findings do not suggest that ReAttach is superior to CBT; rather, they emphasize a differential applicability based on patient states and specific clinical scenarios.

In this study, the researchers introduce an innovative, theory-based clinical framework that aligns the seven emotional state clusters associated with FND with the theoretical and practical principles of ReAttach therapy and its diagnostic tool, the ReAttach M.I.S.T. [1,3–9]. ReAttach serves as a transdiagnostic intervention tailored for both adults and children facing mental health challenges, aiming to optimize arousal, sensory processing, and learning environments prior to engaging in

cognitive restructuring [3].

Given ReAttach's direct focus on enhancing sensory integration, regulating affect, and modifying cognitive biases, it presents a mechanistically sound strategy for tackling the significant variability often seen in FND presentations. By methodically correlating the ten transdiagnostic factors assessed by the ReAttach M.I.S.T. [7] with the distinct emotional profiles that typify the identified clusters of FND [1], this paper intends to establish a structured, hypothesis-generating framework for customizing ReAttach-based interventions according to the unique mental state of patients with FND.

Ultimately, this research aspires to advance precision-oriented psychological interventions by demonstrating how state-dependent phenotyping and transdiagnostic mapping can guide treatment selection that transcends traditional diagnostic classifications, applicable both within FND and across multifaceted psychobiosocial conditions.

Theoretical Architecture: ReAttach and the Neurobiology of Information Processing

To effectively integrate ReAttach therapy with the diverse manifestations observed in FND, it is crucial to elucidate the transdiagnostic mechanisms that inform the choice of interventions. In contrast to conventional psychotherapeutic approaches that predominantly emphasize verbal processing and top-down cognitive strategies, ReAttach is fundamentally anchored in a bottom-up neurodevelopmental framework. This framework prioritizes arousal regulation, sensory integration, and conditions conducive to adaptive learning [3, 4, 5, 6].

The Primacy of Arousal and Sensory Integration in ReAttach

ReAttach is built on the idea that "playing is processing." While this may appear deceptive in its simplicity, it represents a profound neurobiological assertion regarding the conditions necessary for neuroplasticity and learning. The integration of somatic, emotional, and cognitive stimuli is most effective during positive affect (enthusiasm, interest, or surprise). Unlike the dysregulation found in anxiety (hyperarousal) or dissociation (hypoarousal), this "optimal arousal" facilitates engagement, curiosity, and joint attention, which are required for information processing necessary for therapeutic change. Individuals with mental health challenges, particularly in FND, where the integration of limbic and motor networks is compromised, suffer from chronic imbalance in arousal states. Maladaptive patterns in FND, such as functional seizures or paralysis, can be viewed as failures of sensory integration. The conditions for optimal sensory processing are not met, and "priors" (predictive models of the body) override actual sensory input. During ReAttach sessions, the ReAttach Affect Coach actively co-regulates the patient's arousal and, therefore, the affect through synchronization, tactile stimulation, non-verbal cues, and voice

modulation. The ReAttach Affect Coach provides a secure attachment environment to bypass the patient's maladaptive defense mechanism and facilitate stabilization of the autonomic nervous system. By consciously facilitating an "optimal state" in which the patient can process without triggering the functional symptom response, the ReAttach Affect Coach helps the patient to override the fixed mindset of early maladaptive schemas and develop adaptive patterns [3,9].

W.A.R.A.: Ultrafast Transdiagnostic Intervention

For patients with emotional dysregulation, W.A.R.A. is a highly relevant brief ReAttach technique designed for those who exhibit sensory overresponsivity and negative affect. W.A.R.A. can be used as a first-aid psychological intervention to reduce acute stress [4] and can be provided face-to-face or remotely via online intervention [16]. Psychological or pain management interventions often employ distraction techniques to manage acute distress or pain [17,18]. While research has shown that distraction can lower immediate subjective discomfort, the relief is often temporary, with negative affect resurging once the distraction ceases. W.A.R.A., conversely, aims to "wire" or permanently integrate unpleasant feelings into a random, freshly built neutral-to-positive conceptual network and was found to be more effective than distraction [5]. The mechanism of W.A.R.A. addresses "pre-conceptual" negative affect, including sensory stimuli and sub-optimal arousal, visceral feelings, and somatic markers for which the patient may not yet have words [4,5,16]. This is of paramount importance in FND, where alexithymia (difficulty identifying emotions) is prevalent [19]. By regulating arousal through specific tapping frequencies, downregulating from not-optimal to parasympathetic activation, while simultaneously presenting a sequence of unrelated concepts, the intervention forces the brain to wire the negative visceral sensation with a new, neutral neural ensemble [4,5,16]. W.A.R.A. utilizes associative memory formation to wire the nociceptive stimuli. For FND patients, whose symptoms often manifest as pre-conceptual somatic signals, or in other words, negative affect or sensory overresponse, this mechanism offers a way to process the trigger at the neurological level before it cascades into a full symptom flare [20,21,22].

ReAttach as a New Schema Therapy

The dissertation establishing ReAttach positions it as a potential "new schema therapy" for both adults and children [3]. Traditional Schema Therapy (TST) focuses on identifying and modifying Early Maladaptive Schemas (EMSs), which are deeply entrenched patterns of thought and behavior formed to cope with stressful situations in childhood [23,24]. While effective, TST can be a long and emotionally demanding process for the patient. ReAttach targets similar endpoints, such as correcting dysfunctional beliefs about the self and others, but employs a bottom-up, sensory-processing, and adaptive-learning approach rather than a top-down cognitive analysis.

By facilitating "joint attention" and "mentalization" (the ability to understand the mental states of oneself and others) under optimized sensory conditions and social cognitive training, ReAttach allows patients to rapidly rewrite cognitive biases. The ReAttach intervention can occur without prolonged exposure or "limited reparenting" in the traditional sense, which is particularly relevant for FND patients. In patients with FND, trauma focus or an intense emotional focus can sometimes exacerbate physical symptoms due to the fragility of the limbic-motor integration [23]. ReAttach's schema modification is trauma-sensitive but not trauma-focused, and therefore subtle, embedding new "Adaptive Schemas" through optimal learning conditions by stimulating sensory associations rather than through verbal persuasion [3,9].

The M.I.S.T. Framework: Mapping the Individual State of Mind

The M.I.S.T. serves as the diagnostic engine for ReAttach Affect Coaches. It is not a diagnostic tool for pathology in the psychiatric sense (e.g., diagnosing Depression vs. Bipolar), but rather a functional mapping tool [7]. The M.I.S.T. is an interview that ReAttach Affect Coaches use to deconstruct the patient's neuro-psychological status into discrete, measurable transdiagnostic factors. Instead of simplifying the complexity, ReAttach Affect Coaches aim to map the individual's state of mind, use multimodal, tailored ReAttach interventions, engage significant others when relevant, and develop a strategic treatment plan. Understanding these factors is the prerequisite for mapping the therapy to the FND phenotypes. The M.I.S.T. evaluates ten core factors to assess whether the patient is in a state of "Hyper" (over-activation/rigidity) or "Hypo" (under-activation/deficit) functioning.

Arousal Regulation Profiles

The starting point of the M.I.S.T. is the assessment of arousal, as all subsequent transdiagnostic processes depend on this baseline and must be carried out in a fixed order.

Arousal-Hyper: This state of mind refers to an excessively high level of arousal. Clinically, this manifests as daily tension, an inability to cope with busy or noisy environments, and a constant state of being "on." Secondary consequences of an extreme score on Arousal-Hyper include deficits in executive functioning and sensory gating. In FND, this often correlates with the **"Distress" and "Activation"** phenotypes.

Arousal-Hypo: This state of mind refers to a lack of alertness or a "lowered level of consciousness." Patients in this state often present with "brain fog" or attention deficit traits. This profile is critical for understanding the **"Shutdown"** phenotype in FND, representing a dorsal vagal immobilization state.

Social Reward and Attachment

The M.I.S.T. evaluates the activation of the social reward system, which is important for the patient's capacity for connection.

Social Reward-Hyper: This manifests as symbiotic relationships and a lack of autonomy. The patient struggles with distance and boundaries, often merging their identity with others. This is relevant for FND patients with anxious attachment styles who may rely heavily on caregivers for co-regulation.

Social Reward-Hypo: This is characterized by a lack of social initiative, avoidance of eye contact, and often tactile defensiveness. Crucially, the M.I.S.T. notes that underactivation of this system leads to deficits in self-esteem and a sense of belonging. This factor is essential for mapping the "Social Isolation" phenotype in FND.

Sensory and Information Processing

How the brain filters and integrates raw data is a central component of the M.I.S.T.

Multi-Sensory Processing-Hyper: The patient cannot filter stimuli, leading to chaos and an inability to focus on one task. They are constantly bombarded by sensory data.

Mono-Information Processing: The patient processes only one stimulus at a time (fragmented perception). This "pre-conceptual state of mind" results in rigid, detail-focused thinking and poor coherence [3]. This is a frequent finding in autism and severe trauma, and highly relevant for the "Shutdown" FND patient who cannot integrate multi-modal inputs in this state.

Cognitive and Systemic Factors

Conceptualization-Hyper: This state of mind reflects hypervigilance, a condition in which the brain is easily triggered and assigns excessive, often threatening or nociceptive, meaning to neutral stimuli. The triggers are fueled by anxiety, common in FND patients who interpret neutral or benign bodily sensations as catastrophic due to hypervigilance.

Conceptualization-Hypo: If patients have poor conceptualization abilities, they experience difficulties making sense of themselves, significant others, and the world. The world is experienced as disconnected fragments without overview or insight.

System Overprotection vs. Overdemand: The M.I.S.T. evaluates the patient's social environment and assesses the balance in expectations and demands. Overprotection, a lack of trust in the patient's abilities, inhibits exploratory behavior and growth, while Overdemand leads to frustration and burnout. FND symptoms often flourish in environments of Overprotection (secondary gain/maintenance) or Overdemand (symptoms as a necessary "break" or stop signal).

Regulation and Coping Mechanisms

Emotion Regulation-Hyper: Patients with this state of mind exhibit overmodulation, camouflage, and suppression. The patients struggle to express emotions, presenting a facade of invulnerability until they crash.

Emotion Regulation-Hypo: Patients with this state of

mind exhibit explosive affect and dependence on others for their affect regulation. Trauma often over-activates the anxiety system here, leading to triggers and projections.

Coping-Hyper: Manifests as excessive control and neuroticism. The patient tries to control unpredictability by micromanaging the environment.

Coping-Hypo: Presents a learned helplessness, passivity, and dependency on others to solve problems.

The Seven Emotional Phenotypes of FND: A Data-Driven Taxonomy

The integration of the M.I.S.T. framework requires a clear understanding of the target population. Large-scale digital phenotyping of over 1,000 FND patients has identified seven distinct emotional clusters [1], fundamentally challenging the binary "distress/resilience" model. The data reveal that emotional experience in FND is multidimensional and, crucially, that different phenotypes have vastly different relationships with therapeutic interventions. Table 1 summarizes the core data points for these phenotypes as established in the study [1].

Table 1: The Seven Emotional Phenotypes of FND [1]

Emotional state cluster	Core emotional characteristics (brief definition)	Prevalence (%)	Intervention rate (%)	Notes on overlap / fluidity
Distress	High negative affect, anxiety, emotional overwhelm, heightened threat sensitivity	59	39	May overlap with Anger and Activation during periods of symptom escalation
Shutdown	Hypoarousal characterized by emotional numbness, withdrawal, low energy, and reduced engagement	47	9	Patients may shift between Shutdown and Distress depending on arousal state
Activation	Elevated arousal and energy, restlessness, impulsivity, increased activity levels	32	21	Can co-occur with Distress or precede symptom exacerbation
Anger	Irritability, frustration, outward-directed negative affect	29	17	Often embedded within broader Distress-related emotional states
Social isolation	Loneliness, reduced social reward, interpersonal withdrawal	25	8	Frequently associated with Shutdown or prolonged Distress
Resilience	Positive affect (e.g., happiness, contentment, gratitude), typically fragile or unstable in FND	41	4	May rapidly fluctuate toward Distress or Activation under stress
Ambivalence	Mixed, inconsistent, or rapidly shifting emotional states	18	0	Represents transitional or unstable emotional configurations

This data highlights critical gaps, particularly the "Anger Gap" (zero interventions used) and the "Shutdown Paradox" (high prevalence but reduced capacity to engage). The mapping analysis below utilizes this data to propose tailored ReAttach protocols.

Comprehensive Mapping: MIST Profiles and ReAttach Protocols for FND Phenotypes

This section constitutes the core synthesis of the report. For each of the seven FND phenotypes, we apply the M.I.S.T. framework to hypothesize the neuro-psychological state and design a precise ReAttach intervention strategy.

The Distress Cluster: The Hyper-Aroused / Hyper-Conceptualizing Profile

Clinical Presentation:

Representing 40.2% of emotional logs, the Distress Cluster is characterized by co-occurring anxiety, sadness, and frustration. These patients report the highest emotional persistence, with anxious states recurring on consecutive days over 30% of the time. They are the group most typically identified as "psychogenic" FND patients.

MIST Profile Mapping:

Arousal: Hyper: The prevalence of anxiety indicates

a chronically upregulated sympathetic nervous system. The patient is constantly "on," unable to relax or filter out environmental noise.

Conceptualization: Hyper. The "anxious" brain assigns threat meanings to benign somatic signals. A muscle twitch is not just a twitch; it is conceptualized as the onset of a seizure. This hyper-conceptualization drives the symptom feedback loop.

Emotion Regulation: Hypo. Despite the intensity of emotion, the regulation is Hypo—meaning the patient cannot self-regulate and is overwhelmed by the affect, often leading to somatic "discharge" via FND symptoms.

Multi-Sensory Processing: Hyper. The patient is likely scanning the environment and body simultaneously, leading to sensory overload.

Neurobiological Rationale:

In this state, the amygdala is hyperactive, and prefrontal cortical inhibition is reduced. Standard cognitive-behavioral therapy (CBT) often fails because the patient is too aroused to access cognitive control mechanisms [13,14]. ReAttach bypasses the need for top-down cognitive control by directly regulating the autonomic nervous system via co-regulation of arousal, affect, and tactile pathways.

ReAttach Intervention Strategy:

The primary therapeutic goal is Downregulation and Decoupling

1. **W.A.R.A. (First-Aid):** This is the immediate intervention. The W.A.R.A. protocol is used to "wire" the overwhelming negative affect (anxiety/sadness). Because these patients are highly distressed, the therapist acts as the external regulator using face-to-face W.A.R.A. The rapid presentation of random concepts during downregulation forces the brain to dissociate the visceral feeling of anxiety from the catastrophic narrative and to wire the negative affect to the freshly built neural ensemble of random concepts [4,16].

2. **Arousal Regulation:** The therapist must use a slow, rhythmic pace and reassuring voice modulation to lower the patient's hyper-arousal. The goal is to move the patient from a sympathetic "fight/flight" state to a ventral vagal social engagement state and to restore the balance between the sympathetic and parasympathetic nervous systems [3].

3. **The Forgive and Forget Hood (FFH):** This specific self-regulation exercise is introduced to dampen "Hyper-Conceptualization" (hypervigilance). It provides a mechanism for the patient to mentally "transport" ruminative thoughts and fears, clearing working memory space for sensory processing [6,8,25].

4. **CBM (Self-Other Differentiation):** Distressed patients often have porous boundaries. Cognitive Bias Modification exercises should focus on defining the self as separate from others and from the symptoms (CBM1), setting boundaries, and fostering autonomy and adaptive coping styles (CBM2).

5. **CBM (Optimism Bias):** retraining hope for improvement is essential to calm down the overactive amygdala (CBM3).

The Shutdown Cluster: The Hypo-Aroused / Mono-Processing Profile
Clinical Presentation:

Affecting 32.8% of patients, this cluster is characterized by emotional numbing, emptiness, and indifference. Despite moderate physical symptom severity, they report low emotional intensity. This is the "hidden majority" of FND, representing a dissociative, hypo-metabolic state often resistant to standard engagement.

MIST Profile Mapping:

Arousal: Hypo. The clinical presentation of numbness and brain fog aligns with the MIST definition of Hypo-Arousal. The cortex is under-activated.

Social Reward: Hypo. Withdrawal and indifference suggest an underactive social reward system. The patient lacks the drive to connect, making it difficult to establish a therapeutic alliance.

Information Processing: Mono. To prevent overwhelm, the brain restricts sensory intake, processing only one stream at a time (fragmented perception). This effectively blocks the integration required for healing.

Imagination: Hypo. The patient likely struggles to envision a future without symptoms or generate solutions, a hallmark of the "frozen" imagination state.

Neurobiological Rationale:

The Shutdown Cluster represents a dorsal vagal state of immobilization. Cognitive therapies require cortical engagement that is unavailable in this state. ReAttach's bottom-up approach of sensory activation provides the necessary biological substrate for therapeutic engagement.

ReAttach Intervention Strategy:

The primary therapeutic goal is Upregulation and Activation.

Arousal Optimization (The "Wake Up"): Unlike the Distress cluster, these patients need *excitement*. The therapist must increase their own energy, use humor, and employ faster tapping rhythms to stimulate the sympathetic nervous system and help the patient emerge from the dorsal vagal shutdown.

Activating Social Reward: Motivation is a major barrier. ReAttach utilizes specific tactile stimulation (tapping) to trigger oxytocin release. Oxytocin chemically activates the social reward

system, increasing trust and the desire for connection. This is crucial for engaging the "Shutdown" patient who otherwise might not seek help. It is important that we never provide tactile stimulation against a patient's wishes. In cases of tactile defense, the ReAttach Affect Coach might start by using self-regulation techniques before proceeding with ReAttach face-to-face sessions.

Transitioning from Mono to Multi: Therapy must respect the Mono-processing state initially. The therapist starts with simple, concrete concepts and single sensory modalities before gradually introducing complexity as arousal optimizes. Overloading a "Shutdown" patient with complex questions will deepen the shutdown.

Modified W.A.R.A.: In a shutdown state, the patient may not *feel* the affect to wiring it. The first step is to bring them "online, to the middle range" so they can identify the "unpleasant feeling" (even if it is just a somatic sensation of heaviness or "nothingness") and then wire that sensation.

The Activation Cluster: The Hyper-Aroused / Hyper-Coping Profile

Clinical Presentation:

These patients 33.6% report high energy, excitement, and nervousness simultaneously. This paradoxical state creates a risk of "boom-bust" cycles, where patients over-exert themselves during high-energy phases, leading to severe physical crashes. They have the lowest intervention utilization 2.5% because the high energy masks the underlying distress [1].

MIST Profile Mapping:

Arousal: Hyper. High energy is a direct correlate of hyper-arousal. However, the valence is mixed (excitement + anxiety), creating a "nervous energy" profile.

Coping: Hyper. The "boom" phase suggests an excessive internal locus of control and rigidity. The patient believes they can "push through" or control their condition through sheer force of will, ignoring bodily limits.

Multi-Sensory Processing: Hyper. They likely seek stimuli and multitask, unable to filter or stop, leading to a chaotic internal state.

System: Over Demand. The drive to push likely mirrors an environment (past or present) of high demands.

Neurobiological Rationale:

This cluster exhibits a sympathetic overdrive that is misinterpreted as positive vitality. The biological "brake" systems are offline. ReAttach helps recalibrate interoception, allowing the patient to distinguish between genuine vitality and adrenaline-fueled avoidance.

ReAttach Intervention Strategy:

The primary therapeutic goal is Stabilization and Reality Testing.

1. **Addressing Hyper-Coping:** The therapy must validate the patient's need for control (to prevent resistance) while gently introducing the concept of limits. The Forgive and Forget Hood (FFH) is essential here as a self-regulation tool to clear "mental noise", reduce the compulsion to act, and to stop ruminating [6, 25]

2. **CBM for Limits:** Cognitive Bias Modification prompts should focus on permission to stop: "Imagine you dare to say no,""Imagine you can stand still,""Imagine you are valuable even when resting".

3. **W.A.R.A. for "Nervous Energy":** The anxiety underlying the energy needs to be wired. The patient must learn to identify the "nervous" component of their activation and process it using W.A.R.A., leaving only the healthy "energetic" component intact.

4. **Structure:** The therapist provides a highly structured session to counter the chaotic Multi-Sensory Processing, modeling a regulated, focused state to build optimal learning conditions and adaptive schemas.

The Anger Cluster: The Hyper-Aroused / Rigid Profile

Clinical Presentation:

Characterized by frustration, irritation, and overt anger 16.0% of logs. Critically, this group has zero percent utilization of interventions, dubbed the "Anger Gap". This suggests that current self-regulation tools (breathing, mindfulness) are either inaccessible or unacceptable to these patients, possibly because they feel invalidating.

MIST Profile Mapping:

Arousal: Hyper. Anger is a high-energy, high-arousal state mobilizing the fight response.

Coping: Hyper. Frustration often arises from a blocked desire to control outcomes. This aligns with MIST's Hyper-Coping (rigidity, difficulty letting go, "my way or the highway").

Emotion Regulation: Hypo. The presence of overt, unmanaged anger suggests a failure to regulate or modulate intense affect before it externalizes.

Joint Attention: Hyper (Negative). The patient may be hyper-focused on the object of their anger (e.g., medical professionals, family members), lacking the flexibility to shift perspective.

Neurobiological Rationale:

Anger in FND often correlates with a sense of injustice or

lack of agency. It is a defense mechanism. Top-down attempts to "calm down" are perceived as threats to agency. ReAttach restores a sense of agency (internal locus of control) through self-regulation, identification, and active learning (CBM), while physically downregulating the physiological fight-or-flight response.

ReAttach Intervention Strategy:

The primary therapeutic goal is Validation and Flexibility.

1. **Bridging the Anger Gap with W.A.R.A.:** Standard relaxation techniques fail here. W.A.R.A. is uniquely suited because it acknowledges the "unpleasant feeling" without demanding the patient verbally "calm down" or justify the anger. It validates the affect ("focus on that unpleasant feeling") while biologically rewiring it via associative memory formation. Its speed (ultrafast) lowers the barrier to entry for impatient, angry clients.

2. **Forgive and Forget Hood:** This is specifically indicated for "Hyper-Coping" and rigidity. It helps release perceived obstacles and reduces the neurotic need for control that fuels frustration. The FFH helps to let anger go.

3. **Systemic Intervention:** Anger often stems from "System Overdemand" or "System Overprotection." Addressing the family dynamic is crucial to reducing the environmental triggers of anger.

4. **CBM 3 (Optimism Bias):** Re-instilling optimism is crucial to counter the negativity bias inherent in chronic anger.

5. ReAttach New Mind Creation is required to make the transition from a fixed mindset towards a growth mindset with secure attachment styles [8,9].

The Social Isolation Cluster: The Hypo-Social / Mono-Processing Profile

Clinical Presentation:

Dominated by loneliness, grief, and a sense of disconnection (16.3% of logs). This cluster represents a profound breakdown in social connectivity, often exacerbated by the stigma of FND.

MIST Profile Mapping:

Social Reward: Hypo. This is the defining feature. The patient feels no belonging and likely has a deactivated social engagement system. They may have stopped seeking connection entirely.

Joint Attention: Hypo. Isolation leads to a breakdown in shared reality and contact. The patient struggles to maintain focus on the therapist or the "other".

Arousal: Hypo. Grief is often a low-arousal, energy-conserving state, similar to Shutdown but with a specific emotional valence of loss.

Conceptualization: Hypo. The isolation may have led to a "shrunk" worldview, where the patient loses the ability to conceptualize their place in the broader social fabric.

Neurobiological Rationale:

Many patients with FND feel socially isolated, and social isolation is a painful experience [26]. The brain processes social rejection in the same regions as physical pain. ReAttach is a systemic intervention based on attachment [3] that, during the social cognitive training, engages the oxytocinergic system to directly relieve this social pain. ReAttach can be regarded as a dual-action non-invasive treatment for nociplastic pain and psychobiosocial disorders [27].

ReAttach Intervention Strategy:

The primary therapeutic goal is Reconnection and Belonging.

1. **Activating the Social Brain:** The therapist must prioritize activating the social reward system. The tactile element of ReAttach (tapping) serves as a surrogate for social touch, stimulating oxytocin even in the absence of a close relationship. This chemical bridge, provided by another human in a secure environment, is necessary before the social cognitive work can begin.

2. **Proximity Regulation:** Since Social Reward-Hypo patients can be touch-averse or withdrawn, the therapist must gradually titrate proximity. If face-to-face is initially too threatening, the self-regulation W.A.R.A. protocol might be a safer entry point.

3. Social Cognitive training, including the Perspective Taking: Explicitly training "look through the eyes of another," helps reboot the Affective Mentalization capabilities that atrophy during isolation.

4. Search Prompts and CBM for Identity and Belonging: Search prompts help reactivate long-term memories of connection, which are then integrated into the current self-concept to combat the narrative of isolation. Identification with significant others, social groups, and adaptive concepts such as "welcome" helps combat feelings of social exclusion.

5. The ReAttach New Mind Creation Protocol is indispensable in training secure attachment patterns and feeling safe [8,9].

The Resilience Cluster: The Adaptive /Fragile Profile

Clinical Presentation:

Patients report happiness and contentment with 12.8%, but these states are "fragile," with 39% transitioning to anxiety within three days. This suggests a state of "brittle resilience" rather than robust stability.

MIST Profile Mapping:

Coping: Hypo (Latent). The fragility suggests that while they feel good *now*, they lack the robust active coping mechanisms to maintain it under stress. They may be relying on external stability rather than internal regulation.

Conceptualization: Adaptive but unstable. They can form positive concepts, but these may not be deeply anchored or generalized to stressful contexts.

Arousal: Optimal (Currently). They are likely in a good window of tolerance during the log, but easily knocked out of it.

Neurobiological Rationale:

Resilience is not a trait but a dynamic process of recovery. ReAttach fosters resilience by automating the return to optimal processing [3].

ReAttach Intervention Strategy:

The primary therapeutic goal is Consolidation and Deepening.

1. **Anchoring Positive Affect:** ReAttach is not just for pathology; it is for optimizing development. Sessions should focus on "wiring" these positive states (Gratitude, Contentment) to make them readily retrievable neural pathways during stress.

2. **Future-Oriented CBM:** "Imagine you can maintain this feeling even when things get tough." Active learning exercises should simulate potential stressors in the imagination and practice the resilient response while in the optimal arousal state.1

3. **Resilience Training:** Chapter 7 of the ReAttach thesis explicitly discusses using ReAttach to "foster resilience" [3].This involves training the brain to recognize the early signs of stress and auto-correct using tools like the Forgive and Forget Hood.

4. **Strengthening Internal Locus of Control:** Ensuring the patient attributes their good mood and their achievements to their own agency rather than to mere luck.

5. **ReAttach New Mind Creation Protocol:** learning to show exploratory behavior from a secure attachment, developing self-confidence, and resilience [8,9].

The Ambivalent Cluster: The Conflict Profile

Clinical Presentation:

Characterized by simultaneous positive and negative emotions (e.g., Hope + Worry) with 9.5% of logs. This reflects a high cognitive load and internal conflict, often seen in patients starting a new treatment (hopeful it will work, terrified it won't).

MIST Profile Mapping:

Multi-Sensory Processing: Hyper. The brain is holding two opposing streams of data (or emotional valences) simultaneously, creating "noise" and cognitive dissonance.

Conceptualization: Integration Issues. The patient is struggling to integrate the "hope" with the "worry" into a coherent narrative. They are oscillating between concepts rather than holding a unified view.

Emotion Regulation: Unstable. The conflicting emotions threaten to overwhelm the regulatory capacity.

Neurobiological Rationale:

Ambivalence is computationally expensive for the brain. It requires high prefrontal engagement to manage the conflict. ReAttach helps integrate disparate information into coherent schemas, reducing the metabolic cost of the conflict.

ReAttach Intervention Strategy:

The primary therapeutic goal is Integration and Balance.

Processing Conflict: ReAttach excels at integrating disparate information. The ReAttach Affect Coach can use CBM1 to help the patient hold both concepts ("I am worried" AND "I am hopeful") and process them into a coherent whole ("I am facing a challenge with hope") [3].

W.A.R.A. for Complexity: W.A.R.A. can be used to reduce the negative valence of the "worry" component without invalidating the "hope." The therapist might instruct the patient to focus on the "tension of the worry" while wiring it with random concepts, reducing the negative affect [4,5].

CBM1 for Acceptance: "Imagine it is okay to feel two things at once." Validating the complexity prevents the patient from trying to suppress one side, which often leads to the rebound effect [3].

The ReAttach New Mind Creation Protocol helps decrease intolerance for uncertainty and doubt by increasing tolerance for mixed feelings through secure attachment and adaptive schemas [8,9].

The Forgive and Forget Hood can serve as a self-regulation tool to stop ruminating over mixed feelings [6, 25].

Neurobiological Underpinnings: Why ReAttach Fits the FND Brain

FND is increasingly understood through the lens of predictive coding (the Bayesian brain) [28]. In addition, FND patients have strong "priors" (predictions) about their body's incapacity (e.g., "my leg cannot move") that override actual sensory evidence. The "optimal individual state of mind" sought by ReAttach (optimal arousal plus sensory integration) directly addresses these mechanisms in ways that traditional talk therapy cannot [3, 27, 29].

Limbic-Motor Disconnect and Restoration

Neuroimaging in FND shows abnormal connectivity between

the limbic system (amygdala/insula) and motor/sensory cortices [30]. Emotional arousal triggers inappropriate motor inhibition or excitation. By regulating arousal (limbic) while simultaneously engaging in sensory tasks (tapping/listening/imagining), ReAttach essentially "practices" the integration of these networks in a safe, controlled manner. Therefore, ReAttach might facilitate the renormalization of functional connectivity by preventing the limbic hijack that typically triggers FND symptoms.

Updating Priors via Cognitive Bias Modification

FND patients often have fixed beliefs or schemas about their disability/illness identity. ReAttach's specific CBM protocols leverage the optimal processing state to update these priors, train adaptive schemas, and foster a growth mindset [31]. Because the patient is in a state of sensory flow and optimal arousal, the "prediction error" (the difference between their belief they can't move and the motor imagery) is minimized, allowing the new adaptive schema to take root more effectively than through verbal persuasion alone.

The Oxytocin Factor

The tactile component of ReAttach is not merely ritualistic; it is a biological trigger. Gentle, rhythmic stimulation of C-tactile afferents stimulates oxytocin release [32]. Oxytocin modulates the amygdala (reducing fear response) and enhances social cognition [32, 33]. For the "Social Isolation" and "Shutdown" phenotypes, this tactile modulation is likely the mechanism that restores the "safety" signal required for the brain to relinquish its defensive functional symptoms when arousal is well-regulated.

Comparative Efficacy and Clinical Implications

ReAttach vs. Standard Care (CBT)

Standard CBT relies on top-down cognitive control ("think differently to feel differently") [34, 35]. This approach creates a mismatch for several FND phenotypes:

Shutdown Cluster: Cognitive resources are offline; top-down processing is impossible.

Anger Cluster: Cognitive resistance and rigidity block the acceptance of cognitive reframing.

Distress Cluster: Hyper-arousal inhibits the prefrontal cortex, making cognitive work inefficient.

ReAttach offers a bottom-up alternative ("regulate first, then process"). By starting with arousal and sensory integration, it makes the patient available for cognitive work [3].

W.A.R.A. vs. Distraction

The dissertation presents evidence that W.A.R.A. is significantly more effective than distraction for reducing negative affect [3,5]. In FND, distraction is a common coping mechanism, but it is palliative, since the symptoms return when attention returns.

W.A.R.A. offers a tool for *resolution* rather than avoidance. This is critical for the Distress Cluster, where symptom persistence is high. The finding that W.A.R.A. works remotely (though slightly less effectively than face-to-face) opens vital avenues for treating the Social Isolation cluster who may be homebound [16].

A Precision Medicine Pathway

The integration of the M.I.S.T. framework and the 7 Phenotypes allows for the construction of three specific clinical pathways to start the journey of recovery:

Pathway A (High Arousal/Distress/Anger): Prioritize W.A.R.A. and "Forgive and Forget Hood". Focus on downregulation, validation, and reducing the valence of negative affect.

Pathway B (Low Arousal/Shutdown/Isolation): Prioritize tactile activation, humor, and upregulation. Avoid demanding cognitive tasks initially. Focus on oxytocin induction and social connection.

Pathway C (Activation/Resilience): Prioritize stability, reality testing, and resilience anchoring. Focus on preventing the "boom-bust" cycle via regulated limits.

For ReAttach Affect Coaches all clinical pathways should lead to the release of the fixed mindset, optimization of learning, proactive coping, and a growth mindset with secure attachment. Furthermore, in patients with complex symptomatology, ReAttach Affect Coaches should engage significant others to retrain their faith in the patient's growth [8,9,31].

Discussion

This paper presents a theoretical framework designed to address the complexities of FND by integrating large-scale digital emotional phenotyping within the transdiagnostic model of ReAttach therapy and utilizing its diagnostic tool, the M.I.S.T.. Rather than introducing a novel diagnostic category or asserting treatment efficacy, the focus of this research is to tackle the ongoing clinical challenge of significant heterogeneity in emotional, cognitive, and arousal profiles observed in FND patients. This variability often leads to inconsistent responses to psychological interventions, highlighting the need for a comprehensive understanding of these diverse manifestations.

Emotional heterogeneity and mismatch with intervention exposure

The emotional state clusters presented in Table 1 indicate that FND exhibit overlapping and dynamic affective profiles instead of distinct, stable categories. Notably, states such as Shutdown and Social Isolation were found to have a relatively high prevalence but a disproportionately low engagement with psychological interventions. This disparity implies that patients exhibiting hypoarousal, emotional disengagement, or diminished social reward might be inadequately addressed within traditional treatment frameworks, possibly due to their

clinical presentations deviating from conventional distress-centered referral models.

Furthermore, the presence of a Resilience cluster, characterized by positive affect, should not be misconstrued as an indication of ongoing emotional stability. As illustrated in Table 1, resilience-related emotional states in FND appear to be fragile, exhibiting a propensity for rapid shifts toward distress or hyperactivation. This observation challenges the assumption that positive affect is synonymous with recovery or indicates a reduced need for treatment. It underscores the necessity for continuous assessment of emotional states rather than relying solely on static symptom evaluations.

State-dependent limitations of top-down interventions

The observed heterogeneity in psychological conditions carries significant implications for the selection of therapeutic interventions. Cognitive-based approaches, such as CBT, necessitate a baseline of attentional capacity, emotional awareness, and cognitive flexibility from patients. However, both states of hyperarousal (e.g., distress, anger, activation) and hypoarousal (e.g., shutdown, social isolation) can hinder access to these cognitive resources. Consequently, the current model advocates for a state-dependent perspective on treatment efficacy, positing that therapeutic accessibility fluctuates based on arousal levels and sensory integration, transcending mere diagnostic categorizations.

In this framework, the observed low intervention rates within certain high-prevalence clusters may reflect not only systemic barriers to service provision but also the state-dependent inaccessibility of therapies that require significant cognitive engagement. This interpretation is consistent with developing neurobiological theories of FND, which highlight challenges in predictive processing, sensory integration, and the dysregulation of brain-body communications.

Contribution of the ReAttach–M.I.S.T. Mapping

This paper presents a framework for translating emotional phenotyping into clinically relevant hypotheses by mapping emotional state clusters onto the primary transdiagnostic domains identified within the ReAttach M.I.S.T. framework (see Table 2). Instead of adhering to rigid treatment protocols, this approach emphasizes identifying key processing vulnerabilities—such as arousal dysregulation, impaired activation of coping mechanisms, or disrupted social reward processing—that can inform the initial focus of therapeutic interventions.

The ReAttach methodology prioritizes optimization of arousal, synchronization of sensory inputs, and learning under regulated conditions, thus providing a mechanistic complement to conventional cognitive strategies, particularly in scenarios where top-down processing may be impaired. Preliminary evidence from pilot and small-scale studies indicates that ReAttach-based techniques, particularly W.A.R.A., may lead to short-term reductions in negative affect intensity and enhancements in emotional regulation and engagement, pointing to their potential as effective state-sensitive interventions. However, it is important to note that these findings are still in the preliminary stages and necessitate further validation through rigorously controlled trials.

Clinical implications: Toward Precision-Oriented Psychological Care

The proposed architecture presents several significant implications for clinical practice. Firstly, it prompts clinicians to conduct comprehensive assessments that go beyond merely identifying symptom types; they should also evaluate the patient's current psychological state, encompassing factors such as arousal levels, sensory tolerance, and social engagement. Secondly, it endorses a dynamic approach to the sequencing of interventions, wherein bottom-up regulatory strategies and affect integration may precede or operate concurrently with cognitive restructuring techniques. Additionally, the model recognizes that patients may fluctuate between emotional states, which underscores the necessity for continuous reassessment rather than adherence to a rigid treatment protocol.

Importantly, this framework does not advocate for ReAttach as a substitute for CBT or other empirically validated interventions. Rather, it conceptualizes ReAttach as a transdiagnostic and state-sensitive intervention designed to enhance treatment accessibility and readiness, thereby potentially optimizing the timing and efficacy of subsequent cognitive or rehabilitative interventions.

Conclusion

The identification of seven emotional phenotypes in FND exposes the inadequacy of a "one-size-fits-all" therapeutic approach. The binary model of distress versus resilience ignores the silent suffering of the "Shutdown" patient, the unmanaged volatility of the "Anger" patient, and the fragile state of the "Activation" patient.

ReAttach Therapy, with its nuanced diagnostic framework (MIST), offers a theoretically congruent solution to this complexity. By mapping the specific transdiagnostic deficits of each phenotype—whether it be the hyper-arousal of the Distress cluster or the hypo-sociality of the Isolation cluster—clinicians can move beyond generic support. The targeted application of W.A.R.A. for affect wiring, arousal regulation for state optimization, and sensory integration for concept coherence provides a comprehensive toolkit for addressing the multidimensional reality of FND.

Future clinical practice must adopt this granular view, using digital phenotyping to identify the patient's state and the MIST framework to tailor the intervention. Only

by matching the mechanism of the therapy to the specific neurobiological state of the patient can the researchers hope to close the "Anger Gap," awaken the "Shutdown" patient, and stabilize the "Activated" patient, offering a true path to recovery for the full spectrum of FND presentations (Table 2).

Table 2: Full Spectrum of FND

FND emotional state cluster	Dominant M.I.S.T. domains (direction)	Core processing issue	Suggested ReAttach intervention focus
Distress	Arousal (Hyper), Coping (Hyper), Bias (Negative)	Threat dominance, emotional overload	Arousal downregulation; affect wiring (W.A.R.A.)
Shutdown	Arousal (Hypo), Sensory processing (Hypo), Coping (Hypo)	Underactivation, emotional disengagement	Gentle activation; multisensory stimulation
Activation	Arousal (Hyper), Impulse regulation (Hyper)	Excess energy without regulation	Rhythm modulation; impulse containment
Anger	Arousal (Hyper), Social reward (Hypo/Blocked)	Externalized negative affect	Affect integration; social reward repair
Social isolation	Social reward (Hypo), Attachment (Insecure)	Reduced interpersonal motivation	Social reward activation; safe relational engagement
Resilience	Coping (Adaptive but unstable), Bias (Positive)	Fragile stability	Stabilization; reinforcement of adaptive schemas
Ambivalence	Multiple domains (fluctuating)	State instability	State clarification; arousal anchoring

Table 2. Simplified, hypothesis-generating mapping of FND emotional state clusters to dominant transdiagnostic domains assessed within the ReAttach M.I.S.T. framework. The table highlights primary processing vulnerabilities and corresponding intervention focus areas rather than fixed treatment protocols.

Table 3: Clinical translation: M.I.S.T. domains, definitions, and ReAttach intervention strategies

M.I.S.T. domain (direction)	Brief definition (plain language)	Typical clinical signs	ReAttach intervention examples
Arousal – Hyper	Nervous system is overactivated; patient feels tense or overwhelmed	Anxiety, restlessness, muscle tension	W.A.R.A.; slow rhythm regulation
Arousal – Hypo	Nervous system is underactivated; patient feels numb or disengaged	Flat affect, low energy, dissociation	Activating tactile input; increased rhythm
Coping – Hyper	Overcontrolling or compulsive coping	Perfectionism, rigidity	Flexibility training; safety anchoring
Coping – Hypo	Passive or absent coping responses	Helplessness, withdrawal	Coping activation; success experiences
Social Reward – Hyper	Excessive need for approval or reassurance	Clinging, fear of rejection	Boundary regulation; self-reward
Social Reward – Hypo	Reduced motivation for social contact	Isolation, detachment	Social reward activation
Cognitive Bias – Negative	Threat-focused or pessimistic interpretations	Catastrophizing	Cognitive bias modification
Cognitive Bias – Positive (fragile)	Optimism without stability	Overconfidence, boom–bust cycles	Stabilization of adaptive schemas

This paper proposes a precision-oriented and state-sensitive framework for psychological interventions in Functional Neurological Disorders (FND) by linking specific emotional phenotypes to transdiagnostic processing mechanisms. By synthesizing digital emotional phenotyping with the ReAttach–M.I.S.T. model, we establish a cohesive hypothesis framework that enables the customization of ReAttach interventions based on an individual's current mental state. While empirical validation remains necessary, this approach emphasizes a promising pathway for addressing the heterogeneity associated with FND, as well as other complex psychobiosocial disorders.

Limitations and Future Directions

Several limitations must be recognized in this study. The proposed mappings are largely theoretical and based on preliminary evidence rather than data derived from randomized controlled trials within FND populations. The intervention rates presented in Table 1 reflect exposure levels rather than demonstrating efficacy. Furthermore, the emotional state clusters identified are not mutually exclusive and may fluctuate over time.

Future research is necessary to empirically assess whether matching interventions to the identified states enhances engagement, symptom trajectories, or functional outcomes in comparison to standard care practices.

Prospective studies that incorporate digital phenotyping, M.I.S.T.-based assessments, and longitudinal outcome measures are essential for evaluating the clinical applicability of this framework. Additionally, investigating how state transitions occur throughout the treatment process may yield crucial insights into the mechanisms of change and strategies for relapse prevention.

Declaration of interest

Steven Painter is the developer of Neurolog, Dr. Paula Zeestraten is the developer of ReAttach.

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