ISSN: 3051-2492

OPEN ACCESS

ReAttach Affect Coach JOURNAL

Editorial

The Nervous System in State: Reconsidering the Emotional Phenotypes of Functional Neurological Disorder Through an Autonomic Lens

Painter, S.[1], Zeestraten-Bartholomeus, P.[2], and Mehrad, A.[3]

[1]Steven Painter, NeuroLog, United Kingdom
[2]Dr. Paula Zeestraten-Bartholomeus, ReAttach Academy, The Netherlands
[3]Prof. Dr. Aida Mehrad, Universitat Internacional de Catalunya, Barcelona, Spain

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

Abstract

Recent digital phenotyping research identified seven emotional phenotypes in Functional Neurological Disorder (FND), by testing the traditional binary distress-resilience model (Painter et al., 2025). This commentary proposes these phenotypes reflect underlying autonomic states specifically, the fight, flight, and freeze responses of stress physiology/ three F responses (Cannon, 1932). This paper suggests that FND symptoms are not simply different emotional experiences but also involve unique patterns of problems with the autonomic nervous system, which can affect how they should be treated. The concept of a regulatory setpoint is introduced as a system for understanding state persistence and intervention resistance. Clinicians are invited to consider assessment approaches that go beyond symptomatic subtyping to incorporate the autonomic context in which symptoms arise.

Keywords: *Functional Neurological Disorder (FND), fight-flight-freeze, Autonomic Dysregulation, Emotional Phenotypes, Allostatic load, Predictive processing*

Introduction

Functional Neurological Disorder (FND) constitutes a persistent puzzle. Symptoms are genuine, disability is measurable, and neurological pathways are demonstrably involved, yet structural lesions are absent (Hallett et al., 2022). What determines the character of an individual's presentation, and why does it prove so resistant to intervention in many cases? That query is still inadequately answered. The binary model of distressed versus resilient patients, while clinically convenient, has offered little traction on either question.

A recent large study using data from thousands of daily diary entries from people with FND identified seven distinct emotional groups: Distress, Shutdown, Activation, Anger, Social Isolation, Resilience, and Ambivalence (Painter et al., 2025). These outcomes established that emotional experience in FND is multidimensional. What the researchers did not address was why those dimensions exist and what mechanisms might account for the patterns noted, including, critically, the striking finding that patients in the Shutdown, Activation, and Anger clusters demonstrated the lowest rates of intervention utilisation among any group. The present commentary proposes a mechanistic account.

The Autonomic Substrate of Emotional Phenotype

Walter Cannon's (1932) foundational description of the "fight-or-flight" response argues that the autonomic nervous system mobilises in response to perceived dangers. This produces physiological and behavioural states adapted for engagement or escape. Later, a third response was added: freezing, signified by immobility, reduced output, and resource conservation in the face of inescapable threats (Bracha, 2004). These three states are not psychiatric constructs. They are basic modes of the autonomic nervous system found across species.

When mapped against the seven phenotypes identified by Painter et al. (2025), the fit is conspicuous. The shutdown cluster, characterised by affective numbness, emptiness, and low arousal, responds closely to a frozen state. Motor output is reduced, emotional responsiveness is blunted, and the system appears to have entered a conservation mode. The Activation Cluster, in which patients report high energy alongside anxiety and nervous arousal, reflects the hyperactivated profile of a flight state: the thermostat running hot, using resources while scanning for threat. The anger clusters frustration, irritability, and overt anger maps directly onto fight activation; the nervous system directs energy outward in a state of resistance. The Distress Clusters, combining anxiety, sadness, and frustration, may represent oscillation between flight and freeze, consistent with the transition patterns detected in the original data set.

The Social Isolation Cluster warrants particular attention. Withdrawal from social contact is, in simple terms, a sign of the body freezing. It is shutting down from social interaction just when that interaction could help restore balance. This cluster is characterised by loneliness and grief, along with low intervention use. It is not paradoxical; it is predictable.

The Setpoint Problem

McEwen's (1998) concept of allostatic load, the cumulative physiological cost of chronic dysregulation, provides a structure for understanding why these states persist. The nervous system does not exclusively respond to current conditions; it calibrates around a learned baseline formed by prior experience. Long-term dysregulation or early experiences that create a heightened sense of threat can change the normal level of regulation. The system returns to its dysregulated setpoint regardless of what is presented to it from outside.

These events possess direct implications for treatment. Looking at long-term diary data from NeuroLog users shows that people with FND often stay in the same autonomic state, like shutdown or hyperarousal, for several days in a row, much more often than would happen by chance. This is not volitional persistence. It reflects the setpoint phenomenon: a system calibrated to a displaced baseline that returns to that baseline as its default.

Barrett's (2017) predictive processing account offers a complementary explanation. The brain constantly generates predictions about the body's internal state, updating them in light of incoming sensory evidence. In individuals whose prior experience has heavily weighted threat predictions, the system's generative model may default to alarm or shutdown even in objectively safe conditions. Symptoms are not errors in this account; they are the outputs of a prediction engine whose priors have been determined by experience into a configuration that no longer serves the individual well.

Clinical Implications

If FND emotional types reflect autonomic states rather than fixed traits or distinct reactions, multiple important clinical considerations occur. First, assessment may need to go beyond symptomatic subtyping. Knowing that a patient has functional gait disorders or seizures describes nervous system output. Realizing that these symptoms occur in chronic freeze or hyperaroused flight states clarifies the conditions that produce them. These clinical pictures differ, and their response to the same interventions may vary.

In the Second, the near-absence of intervention in the Anger and Activation groups and its sharp decline in the Shutdown group are logical. A nervous system in fight mode resists help by default. In flight, it is too busy scanning to engage. In freeze, it cannot access the motivation to seek or use help. These are state-dependent constraints, not attitudinal barriers. Timing and modality of intervention may matter as much as content.

And, the Resilience Cluster's fragility is notable. A substantial proportion of patients return to anxious or distressed states within days. This is consistent with a setpoint effect. Brief windows of regulation do not recalibrate the baseline. Sustained conditions of safety, co-regulation, and lowered demand may be required to shift the setpoint over time, rather than symptomatic interventions delivered against the current of an unaddressed regulatory baseline.

Conclusion

The emotional heterogeneity of FND is not noise. It is a signal. The seven types found through digital phenotyping show clear patterns in the patients' autonomic states, which affect how and when treatments will work for them. The fight, flight, and freeze framework does not replace subtype-based classification; it runs orthogonally to it, describing the internal conditions under which any given presentation is occurring.

Future research could examine whether assessing a patient's autonomic state during a clinical visit can predict how well they will respond to treatment, and whether helping patients manage their autonomic state before or during specific treatments can lead to better outcomes for those who aren't helped by current methods. When patients have the tools to generate the data, they are already asking these questions. We must now take these questions seriously.

Acknowledgements

The researchers of the study are grateful to all participants of the Neurolog platform who provided consent for the use of their symptom logs.

Declaration of interest:

Steven Painter is the developer of NeuroLog, a free symptom-tracking application for individuals with Functional Neurological Disorder.

References

1. Barrett, L. F. (2017). How emotions are made: The secret life of the brain. Houghton Mifflin Harcourt.
2. Bracha, H. S. (2004). Freeze, flight, fight, fright, faint: Adaptationist perspectives on the acute stress response spectrum. CNS Spectrums, 9(9), 679–685. https://doi.org/10.1017/S1092852900001954
3. Cannon, W. B. (1932). The wisdom of the body. W. W. Norton.
4. Hallett, M., Aybek, S., Dworetzky, B. A., McWhirter, L., Staab, J. P., & Stone, J. (2022). Functional neurological disorder: New subtypes and shared mechanisms. The Lancet Neurology, 21(6), 537–550. https://doi.org/10.1016/S1474-4422(21)00422-1
5. McEwen, B. S. (1998). Stress, adaptation, and disease: Allostasis and allostatic load. Annals of the New York Academy of Sciences, 840(1), 33–44. https://doi.org/10.1111/j.1749-6632.1998.tb09546.x
6. Painter, S., Zeestraten-Bartholomeus, P., & Mehrad, A. (2025). Beyond distress and resilience: Identification of seven distinct emotional phenotypes in Functional Neurological Disorder through large-scale digital phenotyping. ReAttach Affect Coach Journal, 1(2), 97–101.

ReAttach Affect Coach JOURNAL

ReAttach Affect Coach Journal is a peer-reviewed open access journal. © 2025, this is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See http://creativecommons.org/licenses/by/4.0/.