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Peer Review

Review of: "The Polyvagal Theory in Contemporary Psychology: Why Popularity Should Not Be Confused with Scientific Validity"

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I appreciate the effort to critically scrutinize psychological theories. Theory represents the highest level of scientific explanation, yet psychology often lacks clearly defined and formally articulated theories (Eronen & Bringmann, 2021; Oberauer & Lewandowsky, 2019). Being able to understand why phenomena occur - going beyond mere predictive ability - can indeed enhance our understanding of human thought and behavior.

I also fully agree with your concluding statement that “The future of psychology depends on its ability to integrate complexity without abandoning rigor, favoring theories that are not only intuitive but sufficiently supported by data to be clinically and scientifically responsible” (p. 6). The attempt to scrutinize both the soundness of psychological theories and the validity of the instruments used in the field is undoubtedly valuable (Flake & Fried, 2020; Schimmack, 2021). Addressing the theory crisis and the validity crisis appears to be a necessary step toward a more rigorous and ultimately more useful psychology.

That said, I see several limitations in the present work.

Main limitations

1. Popularity and diffusion of Polyvagal Theory

You state that “Polyvagal Theory (PVT) has gained remarkable popularity within clinical psychology, psychotherapy, trauma studies, and applied neuroscience. Despite its widespread adoption in training

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programs and clinical narratives [...]" (p. 1). However, based on Scopus citation data from the past decade, PVT does not appear to have gained such remarkable popularity within these scientific domains. I therefore suggest either providing stronger empirical evidence to support this claim of widespread adoption or moderating this premise accordingly.

2. Insufficient presentation of Polyvagal Theory

The following example of a description of PVT appears overly succinct: "the Polyvagal Theory proposes a hierarchical organization of the vagus nerve into functionally distinct subsystems, including a so-called ventral vagal complex associated with safety and social engagement, and a dorsal vagal complex associated with immobilization and shutdown" (p. 2).

In their current form, the explanations contained in the manuscript do not allow the reader to adequately evaluate the soundness - or lack thereof - of the theory itself. I would suggest expanding the theoretical exposition, making assumptions, proposed mechanisms, and empirical predictions more explicit. This would also allow for a more precise and targeted critique of the alleged fragility of PVT.

3. Critique of microbiota exclusion: lack of references

The critique concerning the exclusion of microbiota from PVT lacks sufficient bibliographic support. For instance, no references are provided for statements such as "The microbiome exerts a powerful epigenetic influence through metabolites, immune signaling, and neuroactive compounds that modulate gene expression, autonomic functioning, and stress responsivity across the lifespan" (p. 5) and "as microbiota-mediated epigenetic signaling represents a primary interface between organism and environment" (p. 5).

I suggest providing references for each of these claims, allowing the reader to independently evaluate the strength of the proposed criticism.

4. Principle of causal completeness

You state that "By excluding the microbiota, the Polyvagal Theory violates the principle of causal completeness and reduces regulation to a host-centered neural narrative" (p. 5). However, this principle is not cited or defined. Moreover, a theory is not necessarily required to include every possible factor to remain explanatorily valid, but only those that are relevant. The present manuscript does not sufficiently

demonstrate that microbiota-related mechanisms are necessary for explaining the specific phenomena addressed by PVT.

Concluding comments

I should note that I am not deeply familiar with Polyvagal Theory. This makes it particularly important that the theory be presented with sufficient clarity and depth, so that readers can meaningfully assess both the theory itself and the validity of the criticisms.

Overall, PVT requires a clearer exposition, with explicit constructs and assumptions. In addition, the instruments used to measure the proposed constructs are discussed only briefly, although they deserve a more in-depth discussion. Moreover, the theory's causal predictions are not clearly specified or referenced. Finally, the critique regarding the absence of microbiota and holobiont perspectives is potentially interesting, but its relevance is not sufficiently justified and it lacks adequate bibliographic support.

Although I agree with the final emphasis on rigor, the manuscript appears to lack rigor in its critique of the theory, and it does not offer a clearly articulated or well-supported alternative framework.

In its current form, the manuscript raises relevant concerns but does not always argue them with sufficient precision or documentation. Strengthening the presentation of Polyvagal Theory, tightening the logical connection between premises and critiques, and providing more systematic references would substantially improve the contribution.

I am happy to engage in further discussion or provide clarifications, if useful.

References

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Declarations

Potential competing interests: No potential competing interests to declare.