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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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Review of

Agnoletti, M. (2026). ***The Polyvagal Theory in Contemporary Psychology: Why Popularity Should Not Be Confused with Scientific Validity***

Dear Dr. Agnoletti,

Thank you for the opportunity to review this manuscript. The comments below are offered in the spirit of constructive scholarly dialogue and are intended to clarify issues of theoretical interpretation and methodological rigor that, if addressed, could substantially strengthen the paper.

Methodological clarification of the object of critique

Before addressing specific claims, it is necessary to clarify what is—and is not—the object of evaluation, as this distinction is central to a fair and scientifically grounded assessment of the manuscript. Your manuscript does not consistently evaluate Polyvagal Theory as it is articulated in its primary and contemporary scientific literature. Instead, it evaluates a conflated representation of the theory that incorporates assumptions drawn from earlier critiques and popularized interpretations. As a result, the manuscript attributes to Polyvagal Theory claims and mechanistic positions that the theory itself does not assert, thereby effectively constructing a strawman version of Polyvagal Theory rather than engaging the theory on its own terms. More broadly, the critique can be understood as the product of not adhering to the foundational literature and of proliferating criticisms based on a misreading of what the theory explicitly states—misreadings that have been substantively adjudicated in the peer-reviewed

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literature. Notably, many of these misattributions can be traced to the interpretive framework introduced by Grossman and Taylor (2007), subsequently reiterated in later publications by Grossman and colleagues. These specific misrepresentations were explicitly identified and responded to at the time (Porges, 2007b) and have been further clarified and updated in subsequent syntheses of the theory, including *The Vagal Paradox: A Polyvagal Solution* (Porges, 2023) and later integrative work that traces the ontogeny of Polyvagal Theory from physiological observation to neural innervation and clinical insight (Porges, 2025).

This methodological issue precedes and undermines the substantive arguments that follow, because subsequent critiques rest on assumptions about the theory that are not grounded in its primary formulations. For example, the manuscript treats Polyvagal Theory as asserting that respiratory sinus arrhythmia (RSA) represents tonic vagal tone and that autonomic regulation operates through rigid, linear state switching—claims that are neither stated nor supported in the primary formulations of the theory. Scientific theories must be evaluated relative to their own stated premises, scope, and empirical commitments, not through externally imposed assumptions or inherited objections. Many of the manuscript's central criticisms closely parallel those advanced by Grossman and colleagues since 2007, yet the paper does not acknowledge that these critiques were explicitly identified and addressed in the literature. This includes early adjudicative commentary responding directly to misinterpretations of vagal function and RSA (Porges, 2007b), subsequent clarification of the state-dependent interpretation of RSA (*The Vagal Paradox*; Porges, 2023), and more recent integrative work outlining the current status, scope, and future directions of Polyvagal Theory (Porges, 2025).

By failing to engage this literature, the manuscript shifts from evaluating Polyvagal Theory on its own terms to critiquing a version shaped by faulty assumptions and unresolved misunderstandings. This observation does not preclude legitimate scientific disagreement with Polyvagal Theory; rather, it highlights that such disagreement must engage the theory as articulated rather than a reconstructed substitute. This conflation obscures meaningful scientific debate and limits the paper's capacity to offer a valid contemporary assessment of the theory. The present comments are offered in the interest of clarifying the object of critique and strengthening standards of theoretical evaluation, rather than adjudicating the ultimate validity of Polyvagal Theory.

Polyvagal Theory explicitly invites critical evaluation when such critique is grounded in the theory's own stated claims and empirical commitments; as articulated across its ontogeny, the theory emerged from physiological observation and progressively specified its basis in neural regulation and patterns of

innervation across development and context. In this instance, however, the manuscript does not meet that standard. A valid critique of Polyvagal Theory would require direct engagement with the theory's stated neurophysiological claims, explicit identification of points of disagreement grounded in those claims, and consideration of how the theory has evolved and been empirically examined in the peer-reviewed literature. In contrast, the present critique is characterized by recurrent category errors (e.g., conflating anatomy with function), misattribution of claims not made by the theory, reliance on outdated or popularized representations, and omission of published responses that have already adjudicated these points. As with any scientific framework, responsible evaluation of Polyvagal Theory presupposes careful engagement with its foundational publications, without which critique risks reproducing inherited misinterpretations rather than advancing understanding.

Substantive alignment with prior critiques

With this methodological context established, it becomes possible to evaluate the substance of the critique itself and its relationship to prior debates in the literature.

Substantively, your manuscript closely parallels objections articulated by Grossman and colleagues beginning with Grossman and Taylor (2007) and reiterated in subsequent publications, including Grossman (2023). These issues are most evident in the Introduction and theoretical background sections, where Polyvagal Theory is characterized in ways that diverge from its primary formulations. These include criticisms of the interpretation of RSA, challenges to the functional distinction between ventral and dorsal vagal pathways, rejection of hierarchical metaphors of autonomic regulation, and objections to the evolutionary framing of vagal organization. While these concerns are presented as novel or decisive, they largely restate a line of argument that has been extensively debated and substantively adjudicated in the peer-reviewed literature.

Importantly, the manuscript does not situate its critique within this historical exchange, nor does it acknowledge published responses that clarify or refine the theory in light of these objections. As a result, earlier points of contention are reintroduced as if unresolved, rather than as ongoing scientific disagreements with an established record of response.

Respiratory sinus arrhythmia and the 'vagal paradox'

A central target of the critique is the use of RSA, which the manuscript treats as if it were a constitutive component of Polyvagal Theory. This framing is incorrect. Within Polyvagal Theory, RSA is not a theoretical construct or defining element of the theory itself, but a physiological metric introduced and

employed in empirical research to test hypotheses derived from the theory concerning state-dependent vagal regulation. The manuscript emphasizes the non-specificity and context dependence of RSA and presents this as a fundamental flaw in Polyvagal Theory. However, Polyvagal Theory does not posit RSA as a unitary, exhaustive, or invariant measure of cardiac vagal tone. Rather, RSA is explicitly treated as a context-sensitive index whose expression varies with underlying neural state and task demands within a broader framework of brainstem-mediated autonomic regulation.

These issues are explicitly addressed in *The Vagal Paradox: A Polyvagal Solution* (Porges, 2023), which examines apparent inconsistencies in RSA–cardiac relations and demonstrates that such variability reflects state-dependent neural organization rather than measurement failure or theoretical error. By not engaging this work, the manuscript critiques an assumed methodological commitment of Polyvagal Theory that the theory itself neither asserts nor requires, thereby reiterating objections that have already been clarified and, in some cases, explicitly disavowed in the contemporary literature.

Evolutionary and anatomical claims

The manuscript further challenges Polyvagal Theory on evolutionary grounds, particularly by emphasizing the presence of myelinated vagal fibers in non-mammalian species. This line of argument conflates anatomical presence with functional organization. Polyvagal Theory does not claim that myelinated vagal fibers are exclusive to mammals; rather, it emphasizes the functional repurposing, nucleus-specific organization, developmental integration, and behavioral coupling of vagal pathways in mammals, particularly in relation to social engagement and co-regulation.

By focusing on fiber characteristics in isolation, the critique evaluates an anatomical claim that Polyvagal Theory does not make, while neglecting the functional and developmental distinctions that are central to the theory's evolutionary framing. More broadly, this pattern reflects a conflation of anatomical description with functional organization and physiological regulation—distinct levels of analysis that Polyvagal Theory explicitly differentiates.

Neuroception and explanatory scope

The manuscript's critique of neuroception raises legitimate concerns regarding operationalization and misuse in popular discourse. However, the construct was originally introduced to name a *subconscious* neural safety–threat detection process that can shift autonomic state outside awareness (Porges, 2005), and it has been progressively specified in later polyvagal syntheses (Porges, 2023; Porges, 2025). Importantly, neuroception is presented within Polyvagal Theory as an inferred biobehavioral process

rather than a localized or directly observable mechanism, functioning as a testable intervening construct linking sensory detection, subcortical integration, and autonomic state regulation to observable physiological and behavioral outcomes. Far from remaining a vague metaphor, subsequent elaborations of the theory have increasingly specified the neural substrates and pathways through which neuroception operates, including afferent sensory pathways to brainstem nuclei (e.g., nucleus tractus solitarius), their integration with limbic and cortical circuits, and the resulting state-dependent modulation of autonomic output, as originally articulated in a phylogenetic and developmental context linking social engagement, attachment, and autonomic regulation (Porges, 2005). Dismissing this construct on the basis that it is not directly measurable applies an epistemological standard that would invalidate many accepted constructs in psychology, psychophysiology, physiology, and behavioral neuroscience. A more productive approach is to evaluate whether the author has engaged the foundational definition and its later refinements before concluding that neuroception is "fuzzy" or purely post hoc.

Similarly, arguments that Polyvagal Theory is undermined by its limited engagement with emerging domains such as microbiota–gut–brain research conflate theoretical scope with scientific plausibility. Given that the majority of vagal fibers are afferent, microbiota–gut–brain signaling influences central regulation primarily through neural pathways that continuously monitor and integrate internal physiological conditions. At the same time, vagal afferent–efferent feedback shapes gastrointestinal motility, immune activity, and visceral tone, thereby contributing to the ecological conditions that influence microbial composition itself. Framing microbiota–gut–brain interactions within an afferent–efferent regulatory loop may therefore enhance causal interpretation and translational relevance. Such an approach aligns naturally with Polyvagal Theory's emphasis on neural regulation, neuroception, and state-dependent physiology, and offers a coherent pathway for integrating emerging microbiota findings into established models of autonomic and biobehavioral regulation.

Notably, an internal inconsistency arises when Polyvagal Theory is criticized for not explicitly incorporating microbiota–gut–brain mechanisms, while the critique's own discussion of the microbiota does not engage the primary neural pathway—vagal afferent signaling—through which microbial signals influence central regulation and autonomic state. This asymmetry weakens the force of the argument and highlights the need for coherent integrative standards on both sides. The absence of integration with every emerging field does not constitute evidence against a theory's core claims, but instead reflects the definitional boundaries and intended scope of the theoretical framework.

Strengths of the manuscript

The manuscript raises an important and timely concern regarding the distinction between scientific validity and clinical or popular uptake. It brings together several common critiques circulating in applied psychology and psychotherapy and reflects a genuine commitment to maintaining biological plausibility and epistemological rigor in psychological theory.

Recommendations for strengthening the manuscript

To enhance the scientific contribution and clarity of the critique, I recommend the following specific revisions:

1. Explicitly distinguish Polyvagal Theory as articulated in the primary scientific literature from simplified or popularized interpretations often encountered in clinical discourse.
2. Anchor critical claims to specific statements made by the theory, citing primary sources where those claims are articulated.
3. Engage published responses that have already adjudicated several of the objections raised, including Porges (2007b), Porges (2023), and the integrative Frontiers paper (Porges, 2025).
4. Clarify levels of analysis throughout the manuscript, particularly distinguishing anatomical description from functional organization and physiological regulation.
5. Reframe the discussion of RSA to reflect its treatment as an index rather than a unitary measure of vagal tone.
6. Situate the discussion of microbiota–gut–brain interactions within an afferent–efferent regulatory framework that acknowledges vagal afferent signaling.
7. Revise the discussion of neuroception to engage its neurophysiological grounding and testable predictions described in foundational literature.

These revisions would allow the manuscript to more directly evaluate Polyvagal Theory on its own terms and would strengthen its contribution to constructive scientific debate.

Conclusion

In summary, your manuscript relies on popularized and simplified misrepresentations of Polyvagal Theory to advance its critique, rather than engaging the theory as articulated in the scientific literature, and therefore does not provide a valid basis for assessing its scientific status. Like all scientific frameworks, Polyvagal Theory invites critical scrutiny when evaluation is grounded in its stated claims, scope, and empirical commitments; absent this grounding, critique risks mischaracterization rather than

advancing understanding. Reiterating objections that have already been adjudicated, without engaging the published responses, substitutes repetition for critical evaluation.

Reviewer

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Declarations

Potential competing interests: No potential competing interests to declare.