A Hybrid Machine Learning Framework for Predicting Emotional Reactivity in Adolescents Using Neurocognitive and Environmental Factors

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1. Round 1

1.1. Reviewer 1

Reviewer:

In the Introduction, paragraph beginning "Emotional reactivity, broadly defined as the intensity, sensitivity, and persistence of emotional responses…", the construct is described theoretically, but the operational definition used in this study is not explicitly stated. Please add one sentence clarifying how this definition maps onto the specific scale and dimensions measured.

The paragraph describing the computerized neurocognitive battery would benefit from task-level detail. Please specify the paradigms used (e.g., Go/No-Go, task-switching), task duration, and primary outcome indices.

In Data Analysis, the sentence "dimensionality reduction techniques were used to mitigate multicollinearity" requires clarification. Please specify which technique was used (e.g., PCA, feature selection thresholds) and how interpretability was preserved.

Authors uploaded the revised manuscript.

1.2.   Reviewer 2

Reviewer:

The paragraph starting "From a neurocognitive perspective, adolescence is marked by asynchronous development…" effectively reviews prior work but does not clearly articulate a guiding integrative model. Consider explicitly stating whether the study is grounded in a transactional, dual-systems, or systems-theory framework to better anchor the ML approach theoretically.

In the paragraph beginning "Traditional variable-centered approaches, while informative…", the argument for machine learning is persuasive but remains general. Please strengthen this section by explicitly linking at least two limitations of linear models to specific properties of emotional reactivity (e.g., threshold effects, nonlinearity).

In the paragraph "Furthermore, cross-cultural perspectives remain underrepresented…", Germany is introduced as the study context. Please justify why Germany is theoretically relevant (e.g., educational structure, emotion socialization norms) rather than presenting it only as a geographical extension.

While Tables 1–4 imply a large sample, there is no a priori or post hoc justification of sample adequacy for machine learning. Please add a short paragraph explaining why the sample size is sufficient relative to feature dimensionality.

In Measures, the phrase "a validated self-report scale assessing emotional reactivity" is vague. Please name the scale, report number of items, response format, and internal consistency for the current sample.

Authors uploaded the revised manuscript.

2.   Revised

Editor's decision after revisions: Accepted.
Editor in Chief's decision: Accepted.