# Predicting Adolescent Psychological Well-Being Using Gradient Boosting Models and Multidimensional Life Satisfaction Indicators

Li. Na[1], Chen. Yu-Han[2*]

[1] Department of Developmental Psychology, Peking University, Beijing, China
[2] Department of Counseling Psychology, National Taiwan University, Taipei, Taiwan

**\* Corresponding author email address**: yuhan.chen@ntu.edu.tw

| E d i t o r | R e v i e w e r s |
|---|---|
| Trevor Archer | **Reviewer 1:** Faranak Saboonchi |
| Professor Department of Psychology University of Gothenburg, Sweden trevorcsarcher49@gmail.com | Assistant Professor, Department of Psychology, Payam Noor University, Tehran, Iran. Email: faranaksaboonchi@pnu.ac.ir |
| | **Reviewer 2:** Maasuomeh Behboodi |
| | Assistant Professor, Counseling Department, Roudehen Branch, Islamic Azad University, Roudehen, Iran. Email: masomehbehbodi@riau.ac.ir |

## 1. Round 1

### 1.1. Reviewer 1

Reviewer:

In the sentence "life satisfaction constitutes one of the most robust and consistent indicators of adolescent well-being", the authors should clarify whether life satisfaction is treated as a proxy, component, or antecedent of psychological well-being in the present study to avoid conceptual overlap with the outcome variable.

The phrase "a validated adolescent well-being scale adapted for Taiwanese populations" lacks specificity. The authors should name the instrument, report its original source, and provide reliability coefficients (e.g., Cronbach's alpha) for the current sample.

Although domain-specific life satisfaction subscales are described, the manuscript does not clarify whether domain scores or individual items were ultimately entered into the final model, which has implications for interpretability and overfitting.

The handling of missing data is described as "model-compatible imputation techniques". The authors should specify the exact imputation method used (e.g., mean imputation, KNN, iterative imputation) and justify its suitability for gradient boosting models.

While cross-validated hyperparameter optimization is mentioned, the manuscript should report the number of folds, the search space, and the evaluation criterion used during tuning to enhance reproducibility.

Table 1 presents descriptive statistics effectively; however, the authors should indicate whether any variables deviated substantially from normality, as this contextualizes the appropriateness of the reported means and standard deviations.

Authors uploaded the revised manuscript.

*1.2.    Reviewer 2*

Reviewer:

While the discussion of family and peer relationships is comprehensive, the paragraph would benefit from a clearer transition explaining how these relational domains are expected to operate within a machine-learning framework, as opposed to traditional regression-based approaches.

The manuscript states that "recent advances in machine learning offer promising alternatives"; however, a brief justification for choosing gradient boosting specifically over other ensemble methods (e.g., random forests, neural networks) should be included here to strengthen methodological coherence.

The study aim is clearly articulated, but the authors should explicitly state whether the primary contribution is predictive accuracy, theoretical insight via explainability, or both, as this distinction affects how results should be interpreted.

Methods – Study Design and Participants, Paragraph 1

The description of the multi-stage cluster sampling is clear, but the authors should report the number of schools and classrooms initially sampled and the final response rate to allow readers to assess potential selection bias.

The eligibility criterion "absence of diagnosed severe cognitive or neurodevelopmental disorders" raises the question of how this information was obtained (school records, parental report, or self-report), which should be explicitly clarified.

Authors uploaded the revised manuscript.

## 2.    Revised

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