




Predicting Family Stability Using Socioeconomic and Cultural Variables via Machine Learning

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1. Round 1

1.1. Reviewer 1

Reviewer:

In the Introduction, the statement “family stability represents a multidimensional construct encompassing emotional cohesion, structural consistency, relational satisfaction, and adaptive functioning” would benefit from a clearer operational definition aligned explicitly with the FACES IV dimensions used later, as the current phrasing introduces conceptual breadth without methodological anchoring.

In the paragraph beginning “Socioeconomic status remains one of the most robust predictors of family functioning,” the authors discuss causal implications (e.g., “influence access,” “contribute to capacity”) despite employing a cross-sectional design, which necessitates more cautious language to avoid overinterpretation of correlational findings.

The sentence “cultural variables exert a profound influence on family stability” in the third paragraph of the Introduction is theoretically sound but insufficiently specified; the manuscript would benefit from a clearer conceptual framework (e.g., Hofstede, Schwartz) to situate constructs such as collectivism and traditionalism within established theoretical models.

In the paragraph discussing immigrant populations, the phrase “the intersection of socioeconomic and cultural factors is particularly salient” is introduced without empirical justification specific to Ecuador, suggesting a need for contextual literature or national statistics to support the relevance of this claim to the study setting.

In Table 3, while performance metrics are reported, the manuscript omits standard deviations or confidence intervals across cross-validation folds, which are necessary to assess model stability and variance.

The statement “the superior performance of ensemble methods highlights their effectiveness” in the Results section would benefit from statistical comparison (e.g., DeLong test for AUC) to substantiate claims of superiority rather than relying on descriptive differences.

In the Discussion, the sentence “communication quality emerged as the strongest predictor of family stability” risks circular reasoning, given that communication is a subcomponent of FACES IV; the authors should address potential construct overlap and multicollinearity.

Response: Revised and uploaded the new document.

1.2. Reviewer 2

Reviewer:

The sentence “machine learning approaches have emerged as powerful tools for analyzing high-dimensional data” would benefit from a critical comparison with traditional statistical approaches (e.g., SEM, regression), particularly regarding interpretability, as this is a central methodological shift in the study.

In the Methods section under “Study Design and Participants,” the statement “selected through a multistage cluster sampling procedure” lacks detail on cluster formation, sampling frames, and selection probabilities, which limits assessment of sampling bias and representativeness.

The sentence “Data collection was conducted over a four-month period” should specify temporal context (e.g., seasonality, socio-political conditions), as these factors may influence family stability and introduce temporal confounds.

In the Measures section, the description “a culturally adapted version of the Cultural Values Scale” is insufficiently detailed, as no information is provided regarding translation procedures, back-translation, or validation metrics beyond Cronbach’s alpha, which is inadequate for construct validity assessment.

The sentence “Cronbach’s alpha coefficients above 0.80 for all major constructs” is reported without specifying exact values per scale, which limits the reader’s ability to evaluate internal consistency across different constructs.

In the Data Analysis section, the phrase “handling missing values through multiple imputation” lacks specification of the imputation model, number of imputations, and assumptions (e.g., MAR vs. MCAR), which are critical for evaluating the robustness of preprocessing.

The sentence “Model performance was evaluated using k-fold cross-validation (k=10)” does not clarify whether stratification was applied, which is particularly important if the outcome variable is imbalanced.

In the Findings section, the statement “the sample consisted of 428 participants from diverse regions of Ecuador” would benefit from a geographic breakdown (e.g., provinces), as “diverse regions” remains vague and limits external validity assessment.

Table 1 is described with “family stability in the sample was moderate to high,” yet no normative benchmarks or scale cutoffs for FACES IV are provided, making this interpretation potentially subjective and insufficiently justified.

In the correlation analysis, the sentence “Family stability showed a strong positive correlation with communication quality ($r = 0.67$)” should include significance levels (p-values) and confidence intervals to strengthen statistical reporting rigor.

Response: Revised and uploaded the new document.

2. Revised

Editor's decision: Accepted.

Editor in Chief's decision: Accepted.