

# Modeling Adolescent Aggressive Behavior Using Trait Anger, Executive Function Inhibition Scores, Family Chaos, and Social Rejection via Gradient Boosted Trees

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## Editor

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## 1. Round 1

### 1.1. Reviewer 1

Reviewer:

The introduction is conceptually rich and thoroughly referenced, offering a sophisticated narrative on trait anger, emotional dysregulation, social rejection, family chaos, and executive function inhibition; however, it often reads as an extended mini-review, and would benefit from a sharper problem statement and a more explicit justification for why a Gradient Boosted Trees/XGBoost model is needed beyond conventional regression, including specific hypotheses (or at least directional expectations) about the relative importance and interactions among the four predictors that the ML model is uniquely positioned to uncover.

The discussion section excels in integrating diverse literatures (clinical, developmental, neurobiological, and digital/online behavior), but it could be improved by more clearly differentiating which implications are directly supported by the current data and which are extrapolations or clinical speculations; mapping each major interpretation back to specific empirical findings from the model (e.g., SHAP ranking, partial dependence trends) would help prevent overinterpretation and make the logical chain from results to implications more transparent and convincing.

Authors uploaded the revised manuscript.

### 1.2. Reviewer 2

Reviewer:

The current treatment of SHAP analysis is conceptually accurate and provides a helpful intuitive description of local feature contributions, yet it remains largely descriptive; the authors should present the SHAP outputs more systematically (e.g., beeswarm plots, dependence plots for key interactions) and clarify whether they examined non-linear and interaction effects (e.g., trait anger  $\times$  family chaos) in the SHAP dependence plots, thereby demonstrating that the ML model is indeed capturing complex patterns that traditional linear models might miss.

The narrative around trait anger as the “most critical determinant” of aggression is theoretically consistent and well-supported by citations, but the language occasionally slips into causal or quasi-deterministic phrasing (“primary catalyst,” “overwhelming predictive weight”) that goes beyond what cross-sectional, observational, and correlational ML models can warrant; I recommend toning down causal implications, explicitly acknowledging that SHAP importance reflects predictive contribution rather than etiological dominance, and highlighting the possibility of reverse or bidirectional influences (e.g., aggressive behavior reinforcing trait anger).

Social rejection, family chaos, and executive function inhibition are convincingly interpreted as meaningful predictors in the discussion, yet the manuscript would be strengthened by a more balanced treatment of alternative explanations and potential confounders; for instance, the authors could consider and discuss the roles of socioeconomic status, comorbid psychiatric conditions, and school-level contextual factors, and clarify whether any such variables were measured and controlled for in either preprocessing or model building, or acknowledge this explicitly as a limitation.

A key limitation of the paper, as it currently reads, is the lack of transparency around the measurement instruments: constructs such as trait anger, family chaos, social rejection, and executive function inhibition are theoretically well-defined, but the specific scales, their psychometric properties, scoring procedures, and any cultural adaptations (e.g., translation, validation in the target population) are not visible in the accessible text; the authors should clearly name each instrument, report reliability indices (e.g., Cronbach’s alpha), and briefly justify their suitability for the studied population.

Authors uploaded the revised manuscript.

## 2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.