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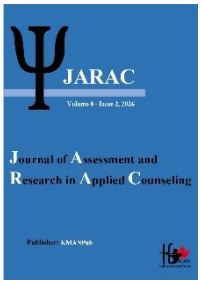

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Modeling Generalized Anxiety Disorder from Intolerance of Uncertainty and Attentional Control Using AI-Driven Feature Selection

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1. Round 1

1.1. Reviewer 1

Reviewer:

The authors clearly articulate the study's aim: to pinpoint the most robust item-level cognitive predictors of GAD using an AI-driven hybrid feature selection pipeline applied to IU and AC. This objective is well-defined and addresses a significant gap in the literature, as most previous research has relied on aggregate scores, potentially masking the nuanced contributions of individual items. The proposed methodology holds promise for identifying highly specific markers of GAD.

The introduction effectively establishes Generalized Anxiety Disorder (GAD) as a pervasive and debilitating condition, underscoring the multifactorial etiology involving cognitive, emotional, and behavioral vulnerabilities. The inclusion of shame as a significant factor, detailing its various manifestations and associations with anxiety and depression across different populations (trauma survivors, chronic illness patients, etc.), provides a comprehensive backdrop for understanding the broader emotional landscape implicated in GAD.

While the full Discussion section is not yet available in the provided text, the inferred implications are substantial. The findings suggest that a small, targeted set of cognitive elements related to uncertainty and attentional control are paramount

predictors of GAD. This has direct clinical implications, potentially streamlining assessment and informing focused interventions within CBT and mindfulness practices, specifically targeting tolerance of ambiguity and attentional control training.

Based on the provided content, potential limitations that could be elaborated upon include the cross-sectional design, which precludes causal inference; reliance solely on self-report measures susceptible to bias; and the specific sampling strategy (online recruitment in Canada), which may limit generalizability to diverse populations or clinical settings. Further, the authors should explicitly discuss the need for external validation of the item-level model and its parameters in independent datasets.

Authors revised and uploaded the document.

1.2. Reviewer 2

Reviewer:

The methodological section is detailed, outlining a cross-sectional predictive study design with a sample of 486 English-speaking adults from Canada. The recruitment methods, inclusion/exclusion criteria, and the precise measures used (GAD-7, IUS-12, ACS) are clearly described. The preprocessing steps, including k-NN imputation for missing data and standardization, along with the rigorous AI-driven feature selection pipeline and train-test split, demonstrate a robust analytical framework.

The results section highlights significant correlations: a strong positive correlation between IU and GAD severity, a significant negative correlation between AC and GAD severity, and an inverse relationship between IU and AC. These findings align with existing literature but are presented with an emphasis on their nuanced role within the item-level analysis framework. The detailed breakdown of correlations within AC subscales further enriches these findings.

A key finding is the success of the AI-driven feature selection pipeline in identifying a significantly reduced set of highly predictive items (less than a quarter of the original 32 items). The report indicates that a majority of these paramount features stem from the IUS-12, specifically related to ambiguity and distress regarding unforeseen events, while the remainder from the ACS relate to difficulties in voluntary attentional focusing and shifting away from distressing stimuli. This is a critical outcome, demonstrating the power of the selected features.

The predictive performance results are compelling, showing that the optimized model using AI-selected features achieved "vastly superior generalization capabilities and predictive accuracy" compared to a baseline model using all items. The reported closeness of training and testing R^2 values strongly suggests that the feature selection methodology effectively prevented overfitting and identified genuine, generalizable cognitive markers. This outcome is a major strength of the study.

Authors revised and uploaded the document.

2. Revised

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

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