PUBLISHING INSTITUTE
Journal Website

Article history:
Received 26 March 2026
Revised 07 June 2026
Accepted 14 June 2026
Initial Publish 25 June 2026
Published online 01 July 2026

Journal of Assessment and Research in Applied Counseling

Open-Peer Review

E-ISSN: 3041-8518

Predicting Life Satisfaction Using Artificial Neural Networks Based on Gratitude, Meaning in Life, Self-Compassion, and Resilience

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1. Round 1

1.1. Reviewer 1

Reviewer:

In the Introduction paragraph beginning "Among the core predictors of life satisfaction, gratitude has received substantial attention," the discussion of gratitude is comprehensive but somewhat general. The authors should explicitly connect gratitude to the expected direction of prediction in the ANN model. For example, the paragraph should indicate whether gratitude is expected to contribute independently to life satisfaction after accounting for resilience, self-compassion, and meaning in life, or whether its role is assumed to be partly indirect through other positive psychological capacities.

In the Introduction paragraph that states "Meaning in life is another major determinant of life satisfaction," the manuscript appropriately emphasizes purpose and coherence, but it should distinguish between the presence of meaning and the search for meaning. Because the Methods section indicates that the Meaning in Life Questionnaire includes both dimensions, the Introduction should explain whether both dimensions were used as a total score or whether only the presence of meaning was

conceptually central. This is important because the presence of meaning and search for meaning may have different or even divergent associations with life satisfaction.

In the Data Collection Tools paragraph, the authors should provide more precise information about the versions and translations of the instruments used in Germany. The paragraph names the SWLS, GQ-6, MLQ, SCS-SF, and CD-RISC-25, but it does not state whether validated German-language versions were used, whether translation/back-translation was conducted, or whether cultural adaptation procedures were applied. This is essential because measurement validity may differ across linguistic and cultural contexts.

In the Data Collection Tools paragraph stating that "construct validity was examined through confirmatory factor analysis," the manuscript should report the CFA model specifications and fit criteria either in the Methods or Findings section. The authors should indicate whether each scale was tested separately or through a full measurement model, which fit indices were used, and what thresholds were considered acceptable. Without these details, the statement remains methodologically incomplete.

Authors revised and uploaded the document.

1.2. Reviewer 2

Reviewer:

In the Introduction paragraph beginning "Self-compassion is also a critical psychological resource," the authors should improve the specificity of the theoretical mechanism. The current paragraph states that self-compassion may reduce punitive self-evaluation and support emotional balance, but it would be stronger if it clearly explained how self-kindness, common humanity, and mindfulness jointly contribute to life satisfaction. This would create better conceptual consistency with the Self-Compassion Scale–Short Form used in the Methods section.

In the Introduction paragraph that begins "Resilience represents another essential component of well-being," the manuscript should clarify whether resilience is conceptualized as a trait, a process, an outcome, or a dynamic capacity. The current wording shifts between these meanings. Since the study uses the Connor–Davidson Resilience Scale, which operationalizes resilience as an individual psychological capacity, the theoretical discussion should be aligned more closely with that measurement model.

In the final Introduction paragraph stating that "artificial neural networks provide a promising analytical approach," the justification for using ANN should be developed more rigorously. The manuscript claims that ANN can capture nonlinear and interactive patterns, but it should explain why ANN was preferable to multiple linear regression, structural equation modeling, random forest, gradient boosting, or support vector regression. A brief methodological rationale would make the machine-learning component more scientifically convincing.

In the Methods paragraph beginning "This study employed a cross-sectional predictive research design," the recruitment procedure requires more detail. The manuscript reports that participants were recruited from universities, workplaces, and community organizations in Berlin, Munich, Hamburg, Frankfurt, and Cologne, but it does not specify how recruitment occurred, whether through email invitations, online advertisements, institutional mailing lists, or direct contact. This information is necessary for evaluating selection bias and reproducibility.

In the Methods paragraph stating that "a stratified convenience sampling strategy was adopted," the manuscript should explain the strata and how they were implemented. The phrase combines two different sampling logics: stratified sampling implies planned subgroup representation, whereas convenience sampling implies nonprobability access-based recruitment. The authors should specify whether quotas were used for gender, age, education, city, or employment status and whether the final sample reflects the intended strata.

In the Methods paragraph reporting that "1,162 complete datasets were retained," the data-cleaning process needs greater transparency. The manuscript states that cases were screened for missing values, response consistency, duplicate submissions, and multivariate outliers, but it does not report how many cases were removed for each reason. A participant flow description should be added so readers can determine whether exclusions may have influenced the final sample composition.

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

Authors revised and uploaded the document.

2. Revised

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

JARAC
Assessment and Research in Applied Counseling
E-ISSN: 3041-8518