

LIFE SATISFACTION LINKS PHYSICAL ACTIVITY TO CHANGES IN GENERAL HEALTH AMONG OLDER ADULTS



Peter D. Hart, PhD
Kinesmetrics Lab
Health Promotion Research
GSA 2026 Annual Scientific Meeting



INTRODUCTION

Regular physical activity (PA) and life satisfaction (LS) are critical concepts of healthy aging that enhance physical functioning and psychosocial resilience in later life. Beyond physiological benefits, evidence suggests that PA may improve general health (GH) indirectly through improvements in subjective well-being. Clarifying this indirect pathway is essential for developing targeted interventions that optimize long-term health and quality of life for older adults.

PURPOSE

This study examined whether LS functions as a psychosocial pathway through which PA influences GH among older adults.

METHODS

Longitudinal data from a sample of more than 3,600 adults aged 50 and older in the 2020 and 2022 Health and Retirement Study were analyzed.

Latent constructs for PA and LS (2020) were validated using classical test theory (CTT) and item response theory (IRT). Structural equation models (SEMs) were then estimated to predict GH in 2022, including an unadjusted model, a model adjusting for baseline GH, and a fully adjusted model controlling for sociodemographic, behavioral, and health covariates.

Indirect effects were evaluated using the joint significance approach and Sobel tests, and additional binary, ordinal, and linear path models using factor scores assessed robustness. All survey-adjusted SEMs demonstrated good fit and significant effects.

All analytical phases were executed independently and in parallel using both STATA (Version 16) and R (Version 4.4.2).

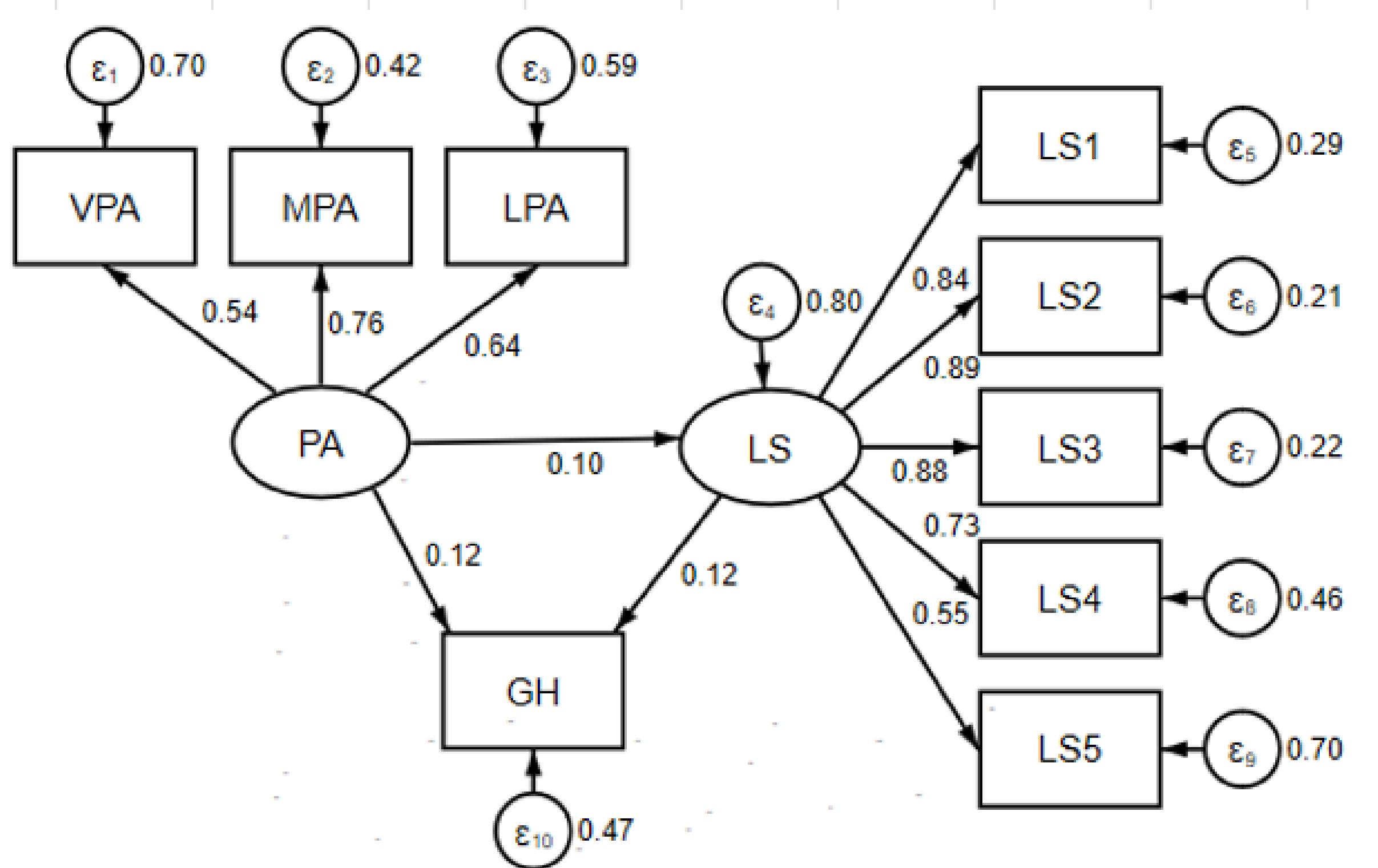
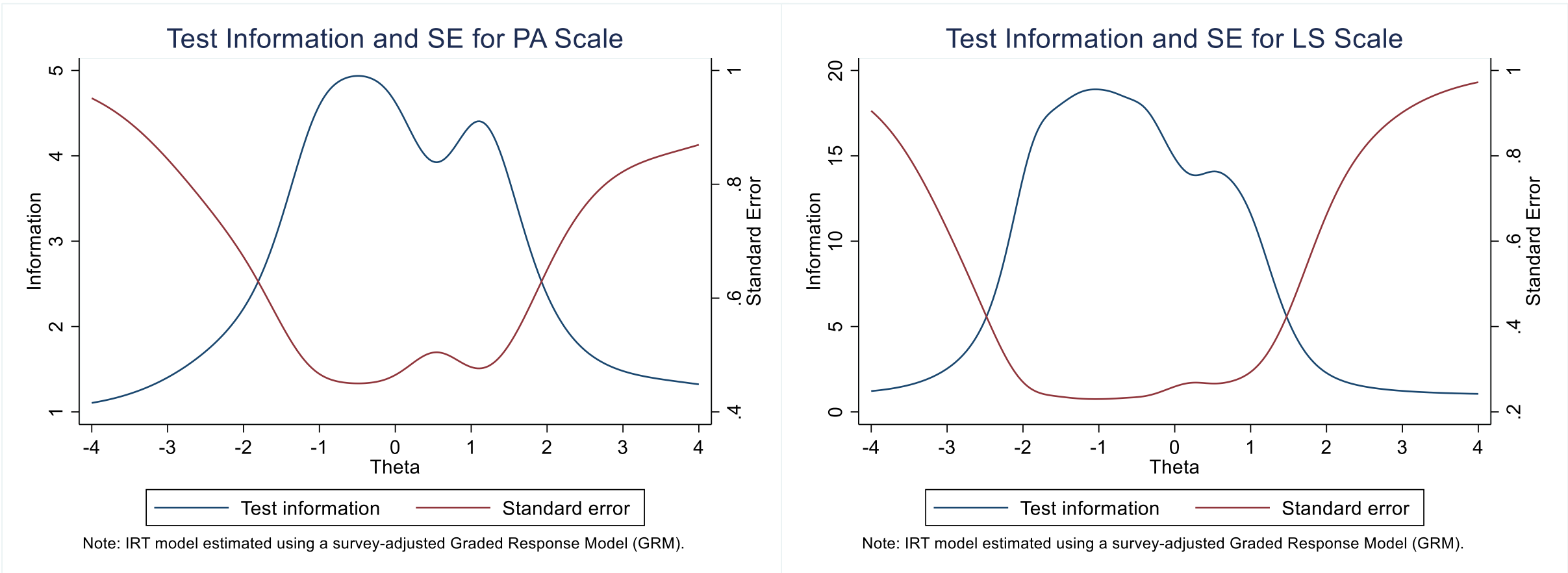
RESULTS

Factor analytic results supported unidimensionality, demonstrating high explained variance (62.7% for PA and 73.3% for LS) and acceptable scale reliability ($\alpha_{\text{ordinal}} = 0.70$ for PA; 0.91 for LS).

RESULTS

Survey-adjusted IRT showed both instruments demonstrated acceptable-to-excellent marginal reliability ($r_{xx'} = 0.74$ for PA; 0.91 for LS) and measurement targeting, securely capturing approximately 90% of their total test information within standard population bounds ($\theta = -3$ to $+3$).

In the fully adjusted SEM, PA predicted higher LS, and LS predicted improvements in GH over time. PA also showed a significant indirect effect on GH through LS, indicating partial mediation. Path model analyses supported these findings; notably, each one-unit increase in PA was associated with higher odds of maintaining or achieving good GH partly because PA improved LS.



Fully-adjusted SEM (SEM 3) predicting change in general health (GH) with physical activity (PA) and life satisfaction (LS).

RESULTS

Path analysis results for general health (GH) across three different model types.									
Model type	Model 1 (N = 3,646)			Model 2 (N = 3,643)			Model 3 (N = 3,571)		
	Estimate	LL	UL	Estimate	LL	UL	Estimate	LL	UL
BLOG									
PA	2.34	2.05	2.67	1.73	1.50	2.01	1.51	1.27	1.79
LS	2.75	2.07	3.66	2.02	1.48	2.74	1.80	1.31	2.46
PA -> LS	1.95	1.74	2.20	1.66	1.45	1.91	1.61	1.38	1.87
PA -> LS -> GH	1.97	1.55	2.39	1.43	1.17	1.69	1.32	1.10	1.54
$p_{\text{mediation}}$		<.0001			<.0001			<.0001	
OLOG									
PA	2.27	2.05	2.51	1.44	1.30	1.60	1.30	1.17	1.45
LS	1.64	1.50	1.78	1.32	1.21	1.43	1.33	1.22	1.45
PA -> LS	1.77	1.62	1.94	1.41	1.28	1.57	1.39	1.25	1.55
PA -> LS -> GH	1.33	1.24	1.42	1.10	1.06	1.15	1.10	1.05	1.14
$p_{\text{mediation}}$		<.0001			<.0001			<.0001	
LR									
PA	0.33	0.29	0.37	0.12	0.09	0.16	0.09	0.05	0.12
LS	0.26	0.21	0.31	0.11	0.08	0.15	0.11	0.08	0.15
PA -> LS	0.29	0.26	0.33	0.18	0.14	0.22	0.17	0.12	0.21
PA -> LS -> GH	0.09	0.07	0.11	0.02	0.01	0.03	0.02	0.01	0.03
$p_{\text{mediation}}$		<.0001			<.0001			<.0001	

Note. CFA factor scores used for all PA and LS variables. BLOG is binary logistic regression. OLOG is ordinal logistic regression. LR is linear (generalized least squares) regression. LS converted to a binary and ordinal variable for BLOG and OLOG models, respectively. Model 1 is unadjusted. Model 2 adjusts for baseline (2020) GH and thus is predicting change in GH. Model 3 adjusts for baseline GH, age, sex, race, income, education, marital status, BMI, smoking status, number of comorbidities, and functional limitation status and also is predicting change in GH. BLOG is modeling the odds of good GH status compared to poor GH status. OLOG is modeling the odds of being in a higher GH category (1 thru 5) versus all lower categories combined. LR is modeling GH (1 thru 5) as a continuous variable. LR presents standardized slopes. PA -> LS (a path) provided for joint significance test. PA -> LS -> GH is the indirect effect. $p_{\text{mediation}}$ is for Sobel test.

CONCLUSIONS

Overall, results suggest that LS is an important psychosocial mechanism linking PA to better health outcomes in later life. Strengthening LS may enhance the health benefits of PA and serve as a promising target for interventions aimed at promoting healthy aging.

REFERENCES

- Sonnega, A. (2025). Using Health and Retirement Study data: A guide for new users. Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI.
- National Institute on Aging. The Health and Retirement Study (HRS) 2022 Core and Leave-Behind Psychosocial Survey Data. Ann Arbor, MI: Survey Research Center, Institute for Social Research, University of Michigan.
- De Ayala RJ. The Theory and Practice of Item Response Theory. 2nd ed. The Guilford Press; 2022.
- Chalmers, R. P. (2012). mirt: A multidimensional item response theory package for the R environment. Journal of Statistical Software, 48(6), 1–29.
- StataCorp. (2025). Stata 16 structural equation modeling reference manual. Stata Press.
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. Journal of Statistical Software, 48(2), 1–36.
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. Psychological Science, 18, 233–239.
- Hayes, A. F., & Scharkow, M. (2013). The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis: Does method really matter? Psychological Science, 24, 1918–1927.
- Stone, C. A., & Sobel, M. E. (1990). The asymptotic distribution of estimates of indirect effects in structural equation models. Psychometrika, 55(2), 337–352.
- Huh, I., & Gim, J. (2025). Exploration of Likert scale in terms of continuous variable with parametric statistical methods. BMC medical research methodology, 25(1), 218. <https://doi.org/10.1186/s12874-025-02668-1>