

The Measurement of Subjective Well-Being: Item Response Theory, Classical Test Theory, and Multidimensional Item Response Theory

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Avhandling för avläggande av filosofie doktorsexamen i psykologi, som vederbörligt tillstånd av samhällsvetenskapliga fakulteten vid Göteborgs Universitet kommer att offentliggöras försvaras onsdagen den 18 maj 2022, kl. 09.00, Psykologiska institutionen, Lokal F1, Haraldsgatan 1, Göteborg.

Fakultetsopponent/*External opponent*: Professor Ulrich Schimmack, Department of Psychology, University of Toronto Mississauga

Ledamöter i betygsnämnden/*Members of the Examining Committee*:

1. Professor Ada Zohar, Faculty of Social & Community Sciences, Ruppin Academic Center
2. Docent Jesper Lundgren, Psykologiska institutionen, Göteborgs universitet
3. Docent Erik Pettersson, Medicinsk epidemiologi och biostatistik, Karolinska institutet

Ordförande vid disputationen/*Chair of public defence*: Professor Lars-Olof Johansson, Psykologiska institutionen, Göteborgs universitet

This doctoral dissertation is based on the following three studies:

- Paper 1** Nima, A. A., Cloninger, K. M., Persson, B. N., Sikström, S., & Garcia, D. (2020b). Validation of subjective well-being measures using item response theory. *Frontiers of Psychology, 10*, 3036. doi:10.3389/fpsyg.2019.03036
- Paper 2** Nima, A. A., Cloninger, K. M., Lucchese, F., Sikström, S., & Garcia, D. (2020a). Validation of a general subjective well-being factor using Classical Test Theory. *PeerJ, 8*, e9193. doi:10.7717/peerj.9193
- Paper 3** Nima, A. A., Garcia, D., Sikström, S., & Cloninger, K. M. Validation of the tridimensional model of subjective well-being (affect, cognition, and behavior) using bifactor polytomous multidimensional item response theory. Under evaluation in *International Journal of Person Centered Medicine*.



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ABSTRACT

Ali Al Nima (2022). *The Measurement of Subjective Well-Being: Item Response Theory, Classical Test Theory, and Multidimensional Item Response Theory*. Department of Psychology, University of Gothenburg, PO Box 500, SE-405 30 Gothenburg, Sweden.

For over 35 years, modern science has conceptualized happiness as subjective well-being, which has until recently been understood as a dual construct consisting of an affective component (positive and negative affect) and a cognitive component (life satisfaction). Nevertheless, for the last five years, theoretical work and both quantitative and qualitative empirical work have suggested that the concept of subjective well-being omits both a lay and an Eastern way of understanding happiness. For instance, laypeople primarily define manifestations of happiness in terms of psychological balance and harmony, rather than just affect and satisfaction. The question is whether, rather than constituting a dual general construct, these three components (i.e., affect, life satisfaction, and harmony in life) form a tridimensional model of subjective well-being. In three studies, 1962 participants self-reported their experience of different positive and negative emotions (Positive Affect Negative Affect Schedule), their satisfaction with life in relation to their own self-imposed ideal (Satisfaction with Life Scale), and their experience of harmony in life (Harmony in Life Scale). The responses were analyzed using unidimensional item response theory (Study 1), classical test theory (Study 2), and multidimensional item response theory (Study 3). In general, in all three studies the 30 subjective well-being items in the model displayed good psychometric properties. However, Studies 1 and 3 showed that there was less reliability for respondents with extreme latent scores in all subjective well-being dimensions. At the item level, all three studies indicated that specific items need to be modified, added, or removed. Second, at the scale level, the subjective well-being instruments have the capability to measure a good portion of people's happiness but lack the capability to measure subjective well-being among individuals who are extremely happy or extremely unhappy. Moreover, at the model level, the results indicate that the best way to conceptualize subjective well-being is as a latent construct with three dimensions (i.e., affective, cognitive, and behavioral) and four components (i.e., positive affect, negative affect, life satisfaction, and harmony in life) in which a person's unique response to each item is directly influenced by her global subjective well-being, but at the same time also by her affective experience, sense of life satisfaction, and sense of harmony in life. In Study 3 specifically, the results indicate that people's levels in each subjective well-being component can compensate for low and high levels in any of the other components. In other words, this is a clear indication of the tridimensional nature of subjective well-being. For people in general, actively affecting emotions, cognitions, and behavior might help to develop sustainable happiness, resilience, and an outlook of unity even amidst the current and future challenges of the twenty-first century.

Key words: Life Satisfaction, Negative Affect, Positive Affect, Harmoni in Life Subjective Well-Being, Item Response Theory, Classical Test Theory, Multidimensional Item Response Theory.

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