Mediation (Dynamic)

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References

Deboeck et al.: No Need to be Discrete: A Method for Continuous Time Mediation Analysis **Deboeck-Preacher-2015**

Pascal R. Deboeck and Kristopher J. Preacher. "No Need to be Discrete: A Method for Continuous Time Mediation Analysis". In: *Structural Equation Modeling: A Multidisciplinary Journal* 23.1 (June 2015), pp. 61–75. DOI: 10.1080/10705511.2014.973960.

Abstract: Mediation is one concept that has shaped numerous theories. The list of problems associated with mediation models, however, has been growing. Mediation models based on cross-sectional data can produce unexpected estimates, so much so that making longitudinal or causal inferences is inadvisable. Even longitudinal mediation models have faults, as parameter estimates produced by these models are specific to the lag between observations, leading to much debate over appropriate lag selection. Using continuous time models (CTMs) rather than commonly employed discrete time models, one can estimate lag-independent parameters. We demonstrate methodology that allows for continuous time mediation analyses, with attention to concepts such as indirect and direct effects, partial mediation, the effect of lag, and the lags at which relations become maximal. A simulation compares common longitudinal mediation methods with CTMs. Reanalysis of a published covariance matrix demonstrates that CTMs can be fit to data used in longitudinal mediation studies.

Ryan et al.: Time to intervene: A continuous-time approach to network analysis and centrality **Ryan-Hamaker-2021**

Oisín Ryan and Ellen L. Hamaker. "Time to intervene: A continuous-time approach to network analysis and centrality". In: *Psychometrika* 87.1 (June 2021), pp. 214–252. DOI: 10.1007/s11336-021-09767-0.

Abstract: Network analysis of ESM data has become popular in clinical psychology. In this approach, discrete-time (DT) vector auto-regressive (VAR) models define the network structure with centrality measures used to identify intervention targets. However, VAR models suffer from time-interval dependency. Continuous-time (CT) models have been suggested as an alternative but require a conceptual shift, implying that DT-VAR parameters reflect total rather than direct effects. In this paper, we propose and illustrate a CT network approach using CT-VAR models. We define a new network representation and develop centrality measures which inform intervention targeting. This methodology is illustrated with an ESM dataset.