A Simulation Study to Check the Consequences of Violating Assumptions in Mediation Analysis

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ABSTRACT

A mediator is a third variable that transmits causal effects from an exposure variable to a response variable. To make inferences on the mediation effect from mediators, usually, four assumptions are required. The general multiple mediation analysis proposed by Yu et al. [1] request three of the assumptions.

In this thesis study, we use simulations to check the inference results when there are violations of the assumptions. We check the biases and variances of estimated mediation effects. We also check the sensitivity and specificity of the general mediation analysis in identifying important mediators when the assumptions are violated. In addition, statistical inferences from linear and nonlinear methods are compared.

As a result, when assumptions are violated, biases would be brought in through genera mediation analysis. Assumptions should be checked before performing the mediation analysis.