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Bias and Mean Squared Error of Six Estimators of the Standardized Mean Change in Pretest-Posttest Designs

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The standardized mean change is widely recognized as a key effect size index in pretest-posttest one-group designs with quantitative dependent variables. Different parametric versions of this index are available, depending on the standardizer used to scale the mean difference into standardized units. In addition, various estimators can be applied to each parameter. This study used a Monte Carlo simulation to assess the bias and mean squared error of several estimators for the standardized mean change. Key factors, such as population effect size, population correlation, sample size, and heterogeneity of pretest and posttest population variances, were systematically manipulated. The results offer valuable insights for selecting the most efficient estimator, taking into account the chosen parameter, study characteristics, and the potential of integrating effect sizes into meta-analyses.
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