A New Statistical Measure of Effect Size: Rate-Adjusted Standardized Mean Difference (RASMD)

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This project developed a new statistical measure of effect size: rate-adjusted standardized mean difference (RASMD). The new measure represents an adjustment to Cohen's measure of standardized mean difference - d, and it is calculated by multiplying d by the square root of the ratio of the harmonic mean of control and treatment group sample sizes and their arithmetic mean. The RASMD measure was developed to provide meta-analysis researchers simplified conversion calculations and more consistent comparisons between the standardized mean difference and the coefficient of correlation r in experimental situations with different underlying sample sizes (e.g. different number of subjects in the control group and treatment group). The project derived relevant formulas for the new measure, verified the consistency of its calculation and conversion to r, validated the construct by applying it to experimental samples generated by Monte Carlo simulation, and illustrated its utility by reinterpreting previously published statistical case studies. This study concluded that the newly defined RASMD measure provides accurate accounting of differences in experimental sample sizes for conversion to the coefficient of correlation, and that using RASMD simplifies the relevant conversion calculations to r. The study recommends that researchers should report RASMD (in addition to d, not instead of d) as part of study results, especially for studies with unequal-n experimental designs to reduce the likelihood of faulty measure interpretations and facilitate a work’s integration into meta-analyses.

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