Four Best Practices for Meta-Analysis: A Systematic Review of Methodological Rigor in Mathematics Interventions for Students with or at Risk of Disabilities

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#1. Moderator Analysis Methods

- **Purpose**: Identify what study features explain heterogeneity when assessing the effectiveness of existing interventions (Li et al., 2020).
- **Types**: Meta-regression, subgroup analysis, analysis of variance (ANOVA), etc.
- **Among 29 meta-analyses from 2000 to 2022**, all studies did it.
- **Suggestion**: Use meta-regression, along with the moderator analysis appropriate for research questions.

#2. Small Sample Corrections

- **Purpose**: Adjust a meta-analysis for samples with a small number of studies
- **Types**: *t* test, *z* test, x^2 test, Knapp-Hartung correction, etc.
- **Among 29 meta-analyses**, five studies did it.
- **Suggestion**: Use some type of small sample correction to ensure accurate significance inference for the identification of evidence-based practices.

#3. Handling Dependent Effect Sizes

- **Purpose**: Determine the effect of the intervention on different skills
- **Types**: Multilevel modeling (MLM),robust variance estimation (RVE), etc.
- **Among 29 meta-analyses**, nine studies used recommended methods.
- **Suggestion**: Consider how to handle multiple effect sizes per study and include all relevant effect sizes while also properly accounting for the independence among the variables.

#4. Publication Bias Assessment

- **Purpose**: Assess the overrepresentation of positive or large effects reported in peer-reviewed journals, while small, null, or negative effects are often not published in these outlets
- **Types**: Funnel plot, trim and fill, Rosenthal's fail-safe *N*, Egger's regression, etc.
- **Among 29 meta-analyses**, eight studies did it.
- **Suggestion**: Consider the possibility of publication bias when conducting a meta-analysis, and be aware that existing methods for assessing publication bias have some limitations. Researchers should also pay attention to new developments in the methodological field.

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