

American Psychological Association (APA) Meta-Analysis Reporting Standards (MARS)

*Modified from Cooper, H. (2010). *Research synthesis and meta-analysis: A step-by-step approach* (4th ed., Applied Social Research Methods Series, Vol. 2). Thousand Oaks, CA: Sage.

| Section and Topic | Description |
|----------------------------------|---|
| <i>Title</i> | <ul style="list-style-type: none"> • Make it clear that the report describes a research synthesis and include “meta-analysis,” if applicable • Footnote funding source(s) |
| <i>Abstract</i> | <ul style="list-style-type: none"> • The problem of relation(s) under investigation • Study eligibility criteria • Type(s) of participants included in primary studies • Meta-analysis methods (indicating whether a fixed-effects or random-effects model was used) • Main results (including the more important effect sizes and any important moderators of these effect sizes) • Conclusion (including limitations) • Implications for theory, policy, and/or practice |
| <i>Introduction</i> | <ul style="list-style-type: none"> • Clear statement of the question or relation(s) under investigation <ul style="list-style-type: none"> ○ Historical background ○ Theoretical, policy, and/or practical issues related to the question or relation(s) of interest ○ Rationale for the selection and coding of potential moderators and mediators of results ○ Types of study designs used in the primary research, their strengths and weaknesses ○ Types of predictor and outcome measures used, their psychometric characteristics ○ Populations to which the question or relation is relevant ○ Hypotheses, if any |
| <i>Methods</i> | |
| Inclusion and Exclusion Criteria | <ul style="list-style-type: none"> • Operational characteristics of independent (predictor) and dependent (outcomes) variable(s) • Eligible participants populations • Eligible research design features (e.g., random assignment only, minimal sample size) • Time period in which studies needed to be conducted • Geographical and/or cultural restrictions |
| Search Strategies | <ul style="list-style-type: none"> • Reference and citation databases searched • Registries (including prospective registries) searched <ul style="list-style-type: none"> ○ Keywords used to enter databases and registries ○ Search software used and version |

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| | <ul style="list-style-type: none"> • Time period in which studies needed to be conducted, if applicable • Other efforts to retrieve all available studies, e.g., <ul style="list-style-type: none"> ○ Listservs queried ○ Contacts made with authors (and how authors were chosen) ○ Reference lists of reports examined • Method of addressing reports in languages other than English • Process for determining study eligibility • Aspects of reports examined (i.e., title, abstract, and/or full text) <ul style="list-style-type: none"> ○ Number and qualifications of relevance judges ○ Indication of agreement ○ How disagreements were resolved • Treatment of unpublished studies |
| Coding Procedures | <ul style="list-style-type: none"> • Number and qualification of coders (e.g., level of expertise in the area, training) • Intercoder reliability or agreement • Whether each report was coded by more than one coder and, if so, how disagreements were resolved • Assessment of study quality <ul style="list-style-type: none"> ○ If a study quality scale was employed, a description of criteria and the procedures for application ○ If study design features were coded, what these were • How missing data were handled |
| Moderator and Mediator Analyses | <ul style="list-style-type: none"> • Definition of all coding categories used to test moderators or mediators of the relation(s) of interest |
| Statistical Methods | <ul style="list-style-type: none"> • Effect size metric(s) <ul style="list-style-type: none"> ○ Effect size calculating formulas (e.g., means and SDs, use of univariate F-to-r transformation, etc.) ○ Corrections made to effect sizes (e.g., small sample bias, correction for unequal sample sizes, etc.) • Effect size averaging and/or weighting method(s) • How effect size confidence intervals (or standard errors) were calculated • How effect size credibility intervals were calculated, if used • How studies with more than one effect size were handled • Whether fixed-effects and/or random-effects models were used and the model choice justification • How heterogeneity in effect sizes was assessed or estimated • Means and SDs for measurement artifacts, if construct-level relationships were the focus • Tests and any adjustments for data censoring (e.g., publication bias, selective reporting) • Tests for statistical outliers • Statistical power of the meta-analysis • Statistical program or software packages used to conduct statistical analyses |

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| <i>Results</i> | <ul style="list-style-type: none"> • Number of citations examined for relevance • List of citations included in the synthesis • Number of citations relevant on many but not all inclusion criteria excluded from the meta-analysis • Number of exclusions for each exclusion criteria (e.g., effect size could not be calculated), with examples • Table giving descriptive information for each included study, including effect size and sample size • Tables and/or graphical summaries <ul style="list-style-type: none"> ○ Overall characteristics of the database (e.g., number of studies with different research designs) ○ Overall effect size estimates, including measures of uncertainty (e.g., confidence and/or credibility intervals) • Assessment of bias including possible data censoring |
| <i>Discussion</i> | <ul style="list-style-type: none"> • Statement of major findings • Consideration of alternative explanations for observed results <ul style="list-style-type: none"> ○ Impact of data censoring • Generalizability of conclusions, e.g., <ul style="list-style-type: none"> ○ Relevant populations ○ Treatment variations ○ Dependent (outcome) variables ○ Research designs • General limitations (including assessment of the quality of studies included) • Implications and interpretation for theory, policy, or practice • Guidelines for future research |
| <i>References</i> | |