3-5-2021

**Special Education Math Interventions: Meta-Analyses Quality Indicator Coding Protocol**

Gena Nelson  
*Boise State University*
### Publication Codes

| Cell | Variable       | Code     | Explanation                                           |
|------|----------------|----------|------------------------------------------------------|
| A    | Authors        | Name     | List all authors’ last names                        |
| B    | Year           | Number   | Record year of publication                          |
| C    | Journal        | Name     | Record journal; Use full name, do not use acronyms  |

### Quality of Study Focus and Research Questions

| Cell | Variable                                               | Code      | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|---------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D-J  | Clear Research Questions and Conceptualization for the Study | Mark 0, 1 for all variables: | Codes defined:  
D = previous research summarized: previous research is summarized providing a rationale for the current study.  
D = contribution to the field is specifically noted, such as the unique contribution or how the results will impact researchers or practitioners, or perhaps how the current study addresses the limitations of previous reviews.  
F = define key variables: key variables aligned with the study are defined (e.g., math difficulty, intervention, learning disability). This is a bit arbitrary depending on what the authors chose to define. Mark 1 if authors operationally defined at least 1 important construct related to the current study.  
G = clearly stated purpose for the review such as formulating new theory, examining the evidence base of an instructional practice or intervention program  
H = indicating the types of participants who are of interest in the studies and providing information about participants in the introduction (e.g., what is MLD).  
J = provide clearly stated research question. |
### Quality of Eligibility: Inclusion and Exclusion Information

| Cell | Variable                                      | Code | Explanation                                                                 |
|------|-----------------------------------------------|------|-----------------------------------------------------------------------------|
| K    | Range of Publication                          | Select one: 0 = no, 1 = yes | Codes Defined:  
- there was not a range of publication years provided in the search or inclusion criteria.  
- There was a range of publication years provided in the search or inclusion criteria. |
| L    | Range of Publication Years                    | Range | List range of years, if code is 0 above, then NA.                         |
| M    | Type of Literature Considered                | Select one: 0 = authors did not specify, 1 = peer-reviewed articles only, 2 = peer-reviewed and grey literature | Codes defined:  
- 0 = authors did not specify if they searched peer-reviewed or grey literature  
- 1 = peer-reviewed articles only (also peer-refereed)  
- 2 = peer-reviewed and grey literature (including dissertations, book chapters, conference proposals, technical reports, etc.) |
| N    | Language Requirements                         | List Language of Publication Requirement | List the languages of publication that were considered, list NA if not mentioned. |
| O    | Math Content Focus (Independent Variable)     | Record required math content focus area; list NA when a content area is not the focus (e.g., schema-based instruction) | Record (e.g., copy and paste) the required focus of the study, for example:  
- Fractions  
- Word Problem Solving  
- Early Numeracy  
- Computation  
- Geometry  
- Basic Skills  
- Broad Mathematics (no specific area of focus) |
| P    | Math Content Focus (Ind. Variable) is Identified in Inclusion/Exclusion Criteria | Select one: 0 = NA; the Ind. Variable is not a math content area, 1 = Yes there is a math content area that is the ind. variable BUT it is NOT specified in the inclusion/exclusion. | This code refers to whether or not the author/study simply identified or mentioned the skill or intervention focus that is the independent variable.  
- NA = the variable of interest is not a math content area, but instead an instructional strategy (e.g., peer tutoring)  
- 1 = The article either did not specify the type of intervention that is the focus of the meta-analysis, or the |
| Q | Math Content Focus (Ind. Variable) is Operationally Defined (this could be included in the literature review, purpose, and Method) |
|---|---|
| | Select **one:** |
| 0 = NA; The Ind. Variable of interest in the meta-analysis is not a content focus; but an instructional strategy |
| 1 = No, not reported (the author/article did not provide how their intervention defined the ind. variable) |
| 2 = yes, the author/article provided how their intervention defined the ind. variable |

This refers to whether or not the author or article provide how the research team envisioned the concept or skill (ind. Variable) in relation to their own intervention. The article does not have to read, “we define ratio as…” but there does need to be text provided for the reader to understand how the research team defined the concept. For a good example of how “broad mathematics intervention” focus is defined, see Stevens et al. (2019).

Use NA when the variable of interest is a strategy instead of a content focus (e.g., schema-based instruction).

| R | Instructional Strategy Focus (Independent Variable) this could be included in the literature review, purpose, and Method) |
|---|---|
| | Record required math instructional strategy; list NA when an instructional strategy is not the focus (e.g., schema-based instruction) |

Record (e.g., copy and paste) the required focus of the study, for example:

- Peer tutoring
- Schema-based instruction
- CRA
- Representations
- Meta-Cognition

| S | If Ind. Variable is an Instructional Strategy (e.g., SBI, |
|---|---|
| | Select **one:** |
| 0 = NA; The Ind. Variable of interest in the meta-analysis is |

Similar to the math content focus variables above. If the authors specify that the main focus is on math interventions that use schema-based instruction, peer tutoring, cognitive strategy

Nelson, G. (2021).
| T | If Ind. Variable is an Instructional Strategy (e.g., SBI, peer tutoring) it is Operationally Defined this could be included in the literature review, purpose, and Method) | Select **one**: 0 = NA; no instructional feature as a variable 1 = No, the ind. Variable is an instructional feature but it is operationally defined 2 = yes, the author/article provided how their instructional features is operationally defined | Similar to the math content focus variables above. If the authors specify that the main focus is on math interventions that use schema-based instruction, peer tutoring, cognitive strategy instruction, etc. the ind. Variable of interest is likely the instructional feature. It could also be a content area (e.g., peer tutoring within word problem solving interventions). |
|---|---|---|---|
| U | **Math** Outcome Measure (Dep Variable) | Selected **one**: 0 = No math academic outcome measure requirements 1 = Study listed math academic outcome measure requirements | Codes defined as:  
- 0 = Study did not specify any outcome measure requirements for inclusion or exclusion specifically related to math academic outcomes (e.g., CBM, computation fluency, achievement, WPS)  
- 1 = Study specified outcome measure requirements for inclusion or exclusion that were related to math academic outcomes (e.g., “study must include dependent measure of fraction computation”) |
| V | Grade/Age Code | Selected **one**: 0 = No grade/age requirements | Codes defined as:  
- 0 = Study did not specify any grade/age requirements |
|   |   |   |
|---|---|---|
| **W** Grade/Age | Range of grade or age for participants or NA | Specify range of participant grade or age (years, months) considered for inclusion/exclusion.  
|   |   | NA for code of 0 above |
| **X** Participant Disability or Risk Requirements Code | Selected **one**:  
0 = Participant Disability or Risk requirement was not specified in the Inclusion Criteria  
1 = Disability only required  
2 = Risk or low achievement only required  
3 = Mix of disability and risk  
4 = Mix of disability, risk, or a threshold of disability/risk with typically achieving (this does not refer to mixing different types of disability such as ADHD and LD, it refers to mixing disability OR risk WITH typically achieving or a threshold). | Codes defined as:  
0 = The inclusion criteria for the meta-analysis did not address disability or risk, but the authors did provide disaggregated results for one of these risk populations.  
1 = Study specified that only studies with students with disabilities (or a specific type of disability) were included  
2 = Study specified that only studies with students who were at-risk of disabilities (e.g., reading difficulty) were included  
3 = Study specified that studies with students with disabilities or who were at-risk of disabilities (e.g., reading difficulty) were included (Note: this may include other categories such as low achieving, struggling learning, or behavior challenge)  
4 = Study specified that either students with disabilities or at-risk for disabilities were included, as well as typically achieving students |
| **Y** Participant Risk/disability Requirements | List studies’ criteria for type of disability or NA | List what disability or risk requirements were specified (e.g., reading disabilities-only, developmental disabilities only, no specifications on disability, authors must have included definition of behavior challenge) |
| **Z** Participant **Disability** Criteria | Note **all** that apply related to disability requirement:  
0 = Not Applicable  
1 = percentile cutoff | Codes defined as:  
Not applicable = The authors did not include participants with disabilities in their meta-analysis, or the authors did not include disability as inclusion criteria and therefore, it was not addressed. |
| AA | Participant Difficulty or Risk Criteria (note: This may also be referred to as “struggling learner” “behavior challenges” or “behavioral challenges”) | Note all that apply:  
0 = Not applicable  
1 = percentile cut off on a screening test or measure  
2 = teacher or parent referral or identification  
3 = state test scores/benchmark | Codes defined as:  
- Not applicable = The authors did not include participants with disabilities in their meta-analysis, or the authors did not include disability as inclusion criteria and therefore, it was not addressed.  
- Percentile = authors used a percentile to state students had difficulty/risk, such as performing below the 25th percentile on a measure of reading achievement. |
|---|---|---|---|
| 2 = school, district, or state criteria  
3 = documented  
4 = IEP goal  
5 = Services in special education setting  
6 = Other  
7 = Not described | Separate responses using a semi-colon (e.g., “1; 3; 4”) | - Percentile = authors used a percentile to state students had LD, such as performing below the 10th percentile on a measure of math achievement.  
- School, district, or state criteria = Authors stated that participants had LD according to criteria  
- Documented = Authors stated that the participants had a documented disability (e.g., authors confirmed ASD through documentation; generally, not coded with any other category).  
- IEP = Authors stated that the participants that had IEPs goals  
- Special education setting = Authors stated that students who received special education services or related services in a specific setting (e.g., self-contained, co-taught or inclusive settings, residential school)  
- Other = Authors used other criteria and specified what criteria were  
- Not described = Authors stated that students with disabilities were a focus of their study, but the authors did not provide difficulty criteria they used (authors of the meta-analysis may also state that students were identified with MLD, MD, etc. with methods ‘as described by the author’ although, the specific criteria are still not described). |
“poor academic skills”) 4 = Receiving Intervention for outcomes related to risk/difficulty 5 = Other 6 = Not Described
Separate responses using a semi-colon (e.g., “1; 3; 4”) • Referral = parents or teachers referred students for difficulty in an academic or social/behavior area
• State or district criteria = Authors stated that participants had difficulty according to state or district criteria
• Receiving Intervention = Authors stated that students were included as at-risk or difficulty due to receiving targeted services
• Other = Authors used other criteria and specified what criteria were
• Not described = Authors stated that students with difficulty or risk were a focus of their study, but the authors did not provide difficulty criteria they used (authors of the meta-analysis may also state that students were identified with MLD, MD, etc. with methods ‘as described by the author’ although, the specific criteria are still not described).

| AB | Design Requirements Code | Selected one: | Codes defined as: |
|----|--------------------------|---------------|------------------|
|    | 0 = No design requirements (must mark 0 for the next code) | 1 = Study listed design requirements | • 0 = Study did not specify any design requirements for inclusion or exclusion |
|    | 1 = Study listed design requirements | | • 1 = Study specified design requirements for inclusion or exclusion (e.g., group design, randomized control trial, regression discontinuity, single case) |

| AC | Designs Included | Select one: | Codes defined as: |
|----|----------------|-------------|------------------|
|    | 0 = Not applicable | 1 = SCD only | 0 = Not applicable, no design requirements listed in the inclusion criteria |
|    | 1 = SCD only | 2 = group design only | 1 = SCD only |
|    | 2 = group design only | 3 = SCD and group design | 2 = group design only (experimental and/or quasi-experimental) |
|    | 3 = SCD and group design | | 3 = SCD and group design |

| AD | Inclusion Criteria - Other | List | List any other inclusion criteria that authors specified which is not included in the above codes |
|----|---------------------------|------|-----------------------------------------|

| AE | Exclusion Criteria - Other | List | List any other exclusion criteria that authors specified which is not included in the above codes |
|----|---------------------------|------|-----------------------------------------|

Nelson, G. (2021).
### Quality of Search Procedures

| Cell | Variable | Code | Explanation |
|------|----------|------|-------------|
| AF   | Stated Electronic Databases that were searched | Select **one:**<br>0 = no<br>1 = yes | Authors stated which electronic library data-bases were searched. |
| AG   | List Data-bases | List | Copy and paste electronic data-bases. |
| AH   | Provided the Search Terms | Select **one:**<br>0 = no<br>1 = yes | Authors specified which combination of search terms were used for the electronic search. |
| AI   | Search Methods used | Select **all that apply:**<br>0 = Search not clearly detailed enough to select at least one of the options below.<br>1 = reference lists of relevant reviews<br>2 = reference lists of included studies<br>3 = contact authors or experts in the field<br>4 = table of contents of relevant journals (maybe referred to as hand search)<br>5 = forward citation search<br>6 = other (List other methods) | Select as many that apply. Only select “0” if no information about the search methods are provided. Separate responses using a semi-colon (e.g., “1; 3; 4”) |
| AJ   | Credentials of Searchers | Select **one:**<br>0 = no<br>1 = yes | The credentials of the person(s) conducting the search were specified. Note: If the article states something along the lines of “the first author conducted the search” that is not the equivalent of specifying the credentials. |
| AK   | Number of Searchers | Select **one:**<br>0 = no<br>1 = yes | The number of people conducting that search was specified. |
### Quality of Screening Procedures

| Cell  | Variable                                         | Code                  | Explanation                                                                                                                                                                                                 |
|-------|--------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AL -  | Methods to Screening studies for inclusion and   | Mark 0, 1 for all     | Codes defined as:                                                                                           |
| AR    | exclusion from the review.                       | variables:            | AL = states the number of studies successfully retrieved                                                   |
|       |                                                  | • number retrieved (AL)| AM = states the number of studies screened out because they did not meet eligibility criteria                  |
|       |                                                  | • number screened out (AM)| AN = provides the reasons the excluded studies were excluded                                            |
|       |                                                  | • reasons for exclusion (AN)| AO = states the total number of studies eligible (included) in the review                                 |
|       |                                                  | • total eligible studies (AO)| AP = describes the training and expertise of those who conducted the screening process                    |
|       |                                                  | • training for screening (AP)| AQ = provides details for the method used to resolve any disagreements between screeners (e.g., discussed articles we did not agree on to determine inclusion) |
|       |                                                  | • details for reliability of screening process (AQ)| AR = reliability or interobserver agreement statistics used to evaluate the consistency of the screening process (e.g., provides the agreement % for the screening process) |
|       |                                                  | • reliability of screening process (AR)                  |                                                                                                                                                                                                          |

### Quality of Coding Procedures

| Cell  | Variable                               | Code                  | Explanation                                                                                                                                                                                                 |
|-------|-----------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS -  | Quality of the Coding Scheme            | Mark 0, 1 for all     | Codes Defined                                                                                           |
| AY    |                                         | variables:            | AS = the expertise of researchers who coded studies; Note: If the article states something along the lines of “the first author conducted all coding” that is not the equivalent of specifying the credentials. |
|       |                                         | • expertise (AS)      | AT = the training procedures for using the coding scheme                                                |
|       |                                         | • training (AT)       | AU = the number/% and percent of studies that were double-coded for reliability                          |
|       |                                         | • double-coded (AU)   | AV = the reliability statistics used to evaluate the consistency of each domain/category of the coding scheme |
|       |                                         | • the reliability statistics for IRR/IOA (AV) |                                                                                                                                                                                                          |
|       |                                         | • how/if disagreements were resolved (AW) |                                                                                                                                                                                                          |
|       |                                         | • description of the coding scheme (AX)                  |                                                                                                                                                                                                          |

Nelson, G. (2021).
what the coding scheme looked like (AY)

AW = the procedures used to resolve disagreements; often, this will just be a statement saying that disagreements were resolved via discussion between coders.

AX = the authors provided a brief review of the variables they coded for (e.g., such as categories or titles of codes)

AY = the response categories available for coders to select from (providing a coding sheet might be an example); specific information about how variables of interest were coded such as by providing examples in text (Stevens et al., 2018 is a good example of in text description to this level)

| Cell | Variable | Code | Explanation |
|------|----------|------|-------------|
| AZ   | Study Quality (Did the meta-analysis code the studies for quality?) | Select one:  
0 = nothing related to quality was reported.  
1 = yes, quality was coded for but there were not results presented related to quality  
2 = yes, quality was coded for and results were reported | • 0 = Nothing related to study quality was reported.  
• 1 = study quality was coded for the meta-analysis, but results for quality were not presented.  
• 2 = yes, quality was coded for and results (such as an average quality score or moderator analysis) were reported. |

Note: Quality might be referred to as quality indicators, CEC guidelines, WWC guidelines, evidence-based practice review, and methodological rigor. Methodological rigor means that studies may have been excluded for high attrition, for example, or not being able to appropriately gather results from the study.

| BA   | Quality as a means to exclude studies | Select one:  
NA = code of 0 above.  
0 = no  
1 = yes | If quality was coded for, was it used as a means to exclude low quality studies from the results. (for example, some studies deemed as poor quality or poor methodology were eventually removed from the sample) |

| BB   | Quality Information | Anecdotal | Write a short note about the type of quality you observed (was it referred to as “quality indicators, WWC, CEC quality, etc.”) |

Nelson, G. (2021).
### Student Participant Demographic Information

| Variable                     | Code                  | Explanation                                                                                                                                 |
|------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Total N                      | Number                | ● List the total number of participants across studies; only provide the number as it is presented in text. Do not perform your own calculations. |
| Mean Age or Range            | Number (years)        | ● List the mean age of participants (years, months; 8, 11 for 8 years, 11 months)                                                            |
| Grade Range                  | Grades                | ● Put the range of grade levels included, if grade isn’t provided, include the age range and specify that it is “years”                        |
| Gender Reported              | Select one:           | ● Yes = the meta-analysis provided some information on gender of children                                                               |
|                              | 1 = yes               | ● No = the meta-analysis did not provide any information on gender of children                                                              |
| Males                        | Number or Percent     | ● Total number of participants identified as male                                                                                           |
| Females                      | Number of Children    | ● Total number of participants identified as female                                                                                         |
| Race Reported                | Select one:           | ● Yes = the meta-analysis provided some information on race/ethnicity of children                                                           |
|                              | 1 = yes               | ● No = the meta-analysis did not provide any information on race/ethnicity of children                                                       |
| Race/ethnicity: White        | Number of Children    | ● Total number of participants identified as White                                                                                           |
| Race/ethnicity: Black/African American | Number of Children | ● Total number of participants identified as Black/African American                                                                         |
| Race/ethnicity: Asian American | Number of Children    | ● Total number of participants identified as Asian American                                                                               |
| Race/ethnicity: Hispanic/Latino | Number of Children    | ● Total number of participants identified as Hispanic/Latino                                                                              |
| Race/ethnicity: American Indian/Native American | Number of Children | ● Total number of participants identified as American Indian/Native American                                                                 |
| ELL/ESL Reported             | Select one:           | ● Yes = the meta-analysis provided some information on ELL status of children                                                                |
|                              | 1 = yes               | ● No = the meta-analysis did not provide any information on ELL status of children                                                           |

Nelson, G. (2021).
### Number of Children

- **Total number of participants identified as EL, ELL, LEP**

### SES or FRL Reported

- **Select one:**
  - 1 = yes
  - 0 = no
- **Yes** = the meta-analysis provided some information on SES or FRL status of children
- **No** = the meta-analysis did not provide any information on SES or FRL status of children

### Free/reduced lunch (FRL) or Low Socio-economic status (SES)

- **Number of Children**
- **Total number of participants identified as receiving FRL or considered low SES due to another metric**

---

### Participant Disability and Difficulty Demographic Information

| Variable                                      | Code   | Explanation                                                                                                                                 |
|-----------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Disability (no type provided)                 | Number | ● Authors refer to the studies as having students with disabilities, but the authors don’t specify what *kind/category* of disability.       |
| Disability and/or Risk (not distinguished)    | Number | ● Authors refer to students has having or being at-risk for disabilities but they do not distinguish between the two or provide disaggregated data. |
| Typically Achieving                           | Number | ● List of the number of students or studies identified as “typically achieving”                                                           |
| Multiple Categories                           | Number | ● Study states that studies or students had multiple risk or disability (e.g., one study listed as having 200 participants with LD, EBD, and ADHD but it’s not clear of the 200 how many fall under which category), so you must use Multiple in this case and not record under LD, EBD, or ADHD separately). |
| Learning Disability (may be called *specific* learning disability; SLD) | Number | ● List number of students or studies with LD (general LD, or not specified by reading, writing, math)                                      |
| LD-Reading                                    | Number | ● List number of students or studies with LD-reading; may also be referred to as Dyslexia                                                 |
| LD-math                                       | Number | ● List number of students or studies with LD-math; may also be referred to as Dyscalculia                                               |
| Condition                                      | Number | Notes                                                                 |
|-----------------------------------------------|--------|----------------------------------------------------------------------|
| LD-Writing                                    | Number | List number of students or studies with LD-writing; may also be      |
|                                               |        | referred to as Dysgraphia                                            |
| General Risk (no type provided)               | Number | Authors refer to the studies as having students with risk, but the  |
|                                               |        | authors don’t specific what *kind/category* of risk.                |
| Reading Difficulty                            | Number | List number of students or studies with reading difficulty; poor    |
|                                               |        | readers/spellers, reading challenged; low reaching achievement      |
| Math Difficulty                               | Number | List number of students or studies with math difficulty; poor       |
|                                               |        | computation, math challenged; low math achievement                  |
| Writing Difficulty                            | Number | List number of students or studies with writing difficulty; poor    |
|                                               |        | writing, writing challenged; low writing achievement                |
| Emotional Behavioral Disorder (EBD)           | Number | List number of students or studies with EBD (may also be referred   |
|                                               |        | to as emotional disorder, behavior disability, emotional disability|
| Behavior Risk                                 | Number | List number of students or studies with behavior risk; behavior     |
|                                               |        | challenge; emotional risk; emotional difficulty’ behavior           |
|                                               |        | difficulty; externalizing or internalizing symptoms                 |
| Autism Spectrum Disorder (may also be referred| Number | List number of students or studies with ASD/PDD or Risk of ASD     |
| to as pervasive developmental disorder; PDD)  |        | or risk of ASD                                                      |
| or risk of ASD                                 |        |                                                                    |
| Developmental Delay or Intellectual Disability| Number | List number of students or studies with developmental delay;        |
|                                               |        | intellectual disability (in older studies may also be referred to   |
|                                               |        | as mild mental retardation [MMR] or mental retardation [MR];        |
|                                               |        | could also be called cognitive delay or cognitive disability), or   |
|                                               |        | identified as at risk of DD or ID.                                 |
| Other Health Impairment (OHI) or ADHD         | Number | List number of students or studies with OHI or ADHD                 |
| Speech or language impairment (Speech)         | Number | List number of students or studies with Speech/Language Impairment  |
| Visual impairment/blindness (VI)              | Number | List number of students or studies with visual impairment/blindness|
| Deaf/Hearing Impairment/DHH | Number | ● List number of students or studies who are Deaf (see note for DHH) |
|----------------------------|--------|------------------------------------------------------------------|
| Deaf-blindness             | Number | ● List number of students or studies who are deaf-blind           |
| Orthopedic Impairment      | Number | ● List number of students or studies who have an orthopedic impairment |
| Traumatic brain injury (TBI)| Number | ● List number of students or studies with TBI                    |
| Other                      | Number | ● List the number of students or studies with other identified disabilities (e.g., Tourette’s, anxiety) |

### Quality of Data Analysis Plan and Methodological Information

| Cell  | Variable                                                                 | Description                                                                 | Explanation                                                                 |
|-------|--------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| BK    | Quality of Procedures for Data Analysis Plan                             | Select **one:** 0 = no, 1 = yes                                           | The method for aggregating the results (e.g., aggregating effect sizes) in order to describe patterns within the literature was described. |
| BL    | Type of Effect Size                                                      | Select **all** that apply: 0 = Not Reported, 1 = Cohen’s d ES, 2 = Hedges g ES, 3 = Eta-squared ES, 4 = Tau U, 5 = PND (percent of non-overlapping data), 6 = PAND (percentage of all non-overlapping data), 7 = SMD (standard mean difference), 8 = IRD (Improvement Rate Difference), 9 = LLR = log response ratio, 10 = Phi, 11 = PEM (percentage of data points exceeding the median), 12 = Other | What type of effect size(s) researchers reported in the meta-analysis, for example, hedges’ g. Note: codes 1-3 are common for group design studies; codes 4-11 are common for SCD. |

Nelson, G. (2021).
| BM | Study Dependency | Separate responses using a semi-colon (e.g., “1; 3; 4”) |
|----|------------------|------------------------------------------------------|
|    | Select **one** code: | Note. This code refers to whether researchers provide description of study dependency. If a study does not include any information dependency then code as 0. Specific examples of dependency information are “To address **between**—study dependency” (coded as 1), “A three-level multivariate multilevel model allows dependency **within and between** studies” (coded as 3), or “To address effect size dependency issues” (coded as 4). |
|    | 0 = Not enough information provided to determine. | Note. RVE or robust variance estimation controls for dependency; sensitivity analyses don’t necessarily control for dependency (though they do investigate the effect of dependency). |
|    | 1 = Authors stated that they did not handle study dependency | A little bit more about dependency from Borenstein et al. |
|    | 2 = Did account for between study dependency | “In some cases researchers will report data on several related, but distinct outcomes. A study that looked at the impact of tutoring might report data on math scores and also on reading scores. A study that looked at the association between diet and cardiovascular disease might report data on stroke and also on myocardial infarction. Similarly, a study that followed subjects over a period of time may report data using the same scale but at a series of distinct time-points. For example, studies that looked at the impact of an intervention to address a phobia might collect data at one month, six months, and twelve months. |
|    | 3 = Did account for within study dependency | The defining feature here is that the same participants provide data for the different outcomes (or time-points). We cannot treat the different outcomes as though they were independent |
|    | 4 = Did account for both between and within study dependency | |
|    | 5 = Did handle study dependency but authors did not specify the type of study dependency | |
|    | 6 = Others | |

Nelson, G. (2021).
as this would lead to incorrect estimates of the variance for the summary effect.

Sometimes, a study will include several treatment groups and a single control group. For example, one effect size may be defined as the difference between the placebo group and drug A, while another is defined as the difference between the same placebo group and drug B.

The defining feature here is similar to multiple outcomes, in that some participants (those in the control group) contribute information to more than one effect size. The methods proposed for dealing with this problem are similar to those proposed for multiple outcomes. They also include some options that are unique to the case of multiple comparisons.”

| BN | Type of Meta Analytic Method | Select all that apply: 0 = Not Reported 1 = fixed effect meta-analysis 2 = random effect meta-analysis 3 = meta regression analysis 4 = moderator analysis 5 = mixed effect analysis 6 = sensitivity analysis 7 = meta-analysis of single-case design 8 = other Separate responses using a semi-colon (e.g., “1; 3; 4”) | Note. This code refers to whether researchers provide description of analytic methods. In other words, the code refers to which type of meta-analysis analytic method researchers used in the meta-analysis. In order to identify analytic models, look into the meta-analytic model section. For example, “We used a random-effects meta-regression model” will be coded as 2 and 3, or “Additional moderator analysis was conducted” will be coded as 4. Another way to identify analytic models is look into the title of tables. For example, “Table 2. Parameter Estimates From RVE Random-Effects Model and Meta-Regression Correction Methods” will be coded as 2 and 3. |
| BO | Type of Meta-analysis software | Select **one** code: |
|---|---|---|
|   |   | 0 = Not Reported |
|   |   | 1 = R software |
|   |   | 2 = Comprehensive Meta-Analysis Software (CMA) |
|   |   | 3 = Review Manager (RevMan) |
|   |   | 4 = Stata |
|   |   | 5 = SAS |
|   |   | 6 = JASP |
|   |   | 7 = Jamovi |
|   |   | 8 = Meta-Essentials |
|   |   | 9 = MetaXL |
|   |   | 10 = MetaEasy |
|   |   | 11 = Other |

Note. This code refers to whether researchers provide descriptions of analysis software.

To identify software, look into the description of meta-analysis or at the end of the method section. Another way to identify software is to search “software” in search terms in the article.

For example, “We calculated ESs using **R software** (version 3.3.0; R Core Team, 2016) for each treatment and comparison contrast on all mathematics-related outcomes” will be coded as 1, and “We used the **Comprehensive Meta-Analysis software** (Borenstein, Hedges, Higgins, & Rothstein, 2006) for data analysis” will be coded as 2.

| Quality of the Results |
| --- | --- | --- | --- |
| **Cell** | **Variable** | **Code** | **Explanation** |
| BP | Publication Bias | Select **one**: 0 = no 1 = yes | This code refers to whether or not authors provided results for publication bias analysis such as the *Classic Fail N test*, a funnel plot, etc. This may be reported in the Method, or in a Supplementary Figure. |
| BQ | Long-term Effectiveness | Select **one**: 0 = no 1 = yes, summary effect (or other analysis) for delayed post-test | This code refers to whether or not authors evaluated summary effects beyond post-test, such as with a delayed post-test analysis. |
| BR | Disaggregated results for risk and disability versus typically achieving. | Select **one**: 0 = NA 1 = not disaggregated 2 = somewhat disaggregated 3 = disaggregated | Codes defined as:  
- 0/NA = When the authors only included participants with disabilities, or only included students who were at-risk, there is no need to disaggregate results; therefore, this code is irrelevant. |
| - Disability versus Risk  
- Disability versus Typically Achieving  
- Risk versus Typically achieving  
- Risk and Disability combined versus Typically achieving | • 1 = Authors did not report disaggregated results for typically achieving versus disability or risk.  
• 2 = Authors reported the following types of disaggregated data: Risk and Disability combined versus Typically achieving  
  o BUT, when studies included both disability and risk populations, authors **DID NOT** provide:  
    Disability versus Risk; Disability versus Typically Achieving; Risk versus Typically achieving  
• 3 = Authors reported the following types of disaggregated data (some may not be applicable):  
  o Disability versus Risk (when disability and risk are both included)  
  o Disability versus Typically Achieving (when disability was included) |

| BS | Interpretation of the Results | Select all that apply:  
0 = generalizability of the results is discussed  
1 = limitations  
2 = recommendations or implications  
Separate codes with a ; | Codes Defined:  
0 = authors described the generalizability of the conclusions of the results of the meta-analysis including the relevant student and teacher populations as well as the appropriate contexts and variables of the results. This may also be achieved with authors discussing how their results apply to specific populations or do not generalize; perhaps also by making connections with previous research.  
1 = authors directly acknowledged **limitations** of the current study  
2 = authors recommended next steps or provided implications of the review for relevant domains such as research, practice, policy, and theory as applicable. |

Nelson, G. (2021).
### Math Content Area Focus Specific Information

| Cell  | Variable                          | Code                              | Explanation                                                                 |
|-------|-----------------------------------|-----------------------------------|-----------------------------------------------------------------------------|
| BT - CB | Math Content Focus of the Intervention | Record the number of studies or effect sizes with specific math content focus area | Record (e.g., copy and paste) the required focus of the study, for example:  
  - Fractions, Rational Numbers, Decimals, Percent (BT)  
  - Word Problem Solving (BU)  
  - Problem Solving (BV)  
  - Early Numeracy/Early Math (may be called something else but generally refers to counting, comparison, number line, place value, etc.) (BW)  
  - Computation/Arithmetic/Basic Facts/Operations (BX)  
  - Geometry (BY)  
  - Basic Skills, General Skills (BZ)  
  - Broad Mathematics (no specific content focus; CA)  
  - Other (CB) |
| CC    | Math Content Area Anecdotal       | Notes                             | Record specific information such as “word problem solving as related to addition and subtraction only” |

### Instructional Strategies Effect Size Reporting

| Cell | Variable                                 | Code                              | Explanation                                                                 |
|------|------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------|
| CD   | Components of Explicit and Systematic Instruction | Select one code:  
  0 = no  
  1 = yes | 0 = No summary effect size reported for this instructional strategy.  
  1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CE   | Direct Instruction                       | Select one code:  
  0 = no  
  1 = yes | 0 = No summary effect size reported for this instructional strategy.  
  1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CF   | Feedback (corrective, specific, academic, affirmative) | Select one code:  
  0 = no  
  1 = yes | 0 = No summary effect size reported for this instructional strategy.  
  1 = Yes, there is a summary effect size reported for this instructional strategy. |
| Code | Instructional Strategy            | Select **one** code:                  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
|------|-----------------------------------|--------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------|
| CG   | Self-Regulation                  | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CH   | Concrete Representations          | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CI   | Visual/Pictorial Representations  | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CJ   | CRA Framework                    | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CK   | SBI or SI Framework              | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CL   | Calculator Use                   | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CM   | Peer-Assisted Learning           | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CN   | Computer-assisted learning; technology | Select **one** code: 0 = no 1 = yes  | 0 = No summary effect size reported for this instructional strategy. | 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CO    | Progress Monitoring/Students graphing their results | Select one code: 0 = no 1 = yes | 0 = No summary effect size reported for this instructional strategy. 1 = Yes, there is a summary effect size reported for this instructional strategy. |
|-------|-----------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------|
| CP    | Goal setting                                         | Select one code: 0 = no 1 = yes   | 0 = No summary effect size reported for this instructional strategy. 1 = Yes, there is a summary effect size reported for this instructional strategy. |
| CQ    | Other                                               |                                  | Provide the description.                                                         |

Nelson, G. (2021).