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

Gena Nelson
Boise State University

Special Education Math Intervention Meta-Analyses
Quality Indicator Coding Protocol

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: • previous research summarized (D) • contribution to the field (E) • define key variables (F) • clearly stated purpose (G) • indicating the types of participants (H) • provide clearly stated research question (J)	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) this could be included in the literature review, purpose, and Method	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

		2 = yes, the independent variable was listed or identified as a math content area AND it is addressed in the inclusion/exclusion criteria.	meta-analysis was vague and it was not immediately clear what the independent variable was. • 2 = yes, the article makes statements about the focus of the meta-analysis and type of intervention that is the independent variable. For example, the article might state, "The intervention focused on ratio and unit rate concepts." Or "The independent variable of the included studies was a numeracy intervention."
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

	peer tutoring) it is ***Identified in Inclusion/Exclusion Criteria***	not an instructional variable focus; but a content focus 1 = No, the ind. Variable is an instructional feature but it is not identified in the inclusion/exclusion criteria 2 = yes, the author/article provided how their instructional features is identified in the inclusion/exclusion criteria	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).
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

		1 = Study listed grade/age requirements	● 1 = Study specified grade/age requirements for inclusion or exclusion (e.g., 6-12th grade, kindergarten - 6th grade)
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 **<u>one</u>**: 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 **<u>all</u>** 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.

		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).
AA	Participant **Difficulty or Risk** Criteria (note: This may also be referred to as "struggling learner" "behavior challenges" or	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.

	"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**: 0 = No design requirements (must mark 0 for the next code) 1 = Study listed design requirements	Codes defined as: ● 0 = Study did not specify any design requirements for inclusion or exclusion ● 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**: 0 = Not applicable 1 = SCD only 2 = group design only 3 = SCD and group design	Codes defined as: 0 = Not applicable, no design requirements listed in the inclusion criteria 1 = SCD only 2 = group design only (experimental and/or quasi-experimental) 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

Quality of Search Procedures

Cell	Variable	Code	Explanation
AF	Stated Electronic Databases that were searched	Select **one**: 0 = no 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**: 0 = no 1 = yes	Authors specified which combination of search terms were used for the electronic search.
AI	Search Methods used	Select **all that apply**: 0 = Search not clearly detailed enough to select at least one of the options below. 1 = reference lists of relevant reviews 2 = reference lists of included studies 3 = contact authors or experts in the field 4 = table of contents of relevant journals (maybe referred to as hand search) 5 = forward citation search 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**: 0 = no 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**: 0 = no 1 = yes	The number of people conducting that search was specified.

Quality of Screening Procedures

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

Quality of Coding Procedures

Cell	Variable	Code	Explanation
AS - AY	Quality of the Coding Scheme	Mark 0, 1 for all variables: • expertise (AS) • training (AT) • double-coded (AU) • the reliability statistics for IRR/IOA (AV) • how/if disagreements were resolved (AW) • description of the coding scheme (AX)	Codes Defined 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. AT = the training procedures for using the coding scheme AU = the number/% and percent of studies that were double-coded for reliability AV = the reliability statistics used to evaluate the consistency of each domain/category of the coding scheme

		• 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)

Quality of Reporting Study Quality

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.)

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**: 1 = yes 0 = no	● Yes = the meta-analysis provided some information on gender of children ● 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**: 1 = yes 0 = no	● Yes = the meta-analysis provided some information on race/ethnicity of children ● 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
Race/ethnicity: Other	Number of Children	● Total number of participants identified as Other
ELL/ESL Reported	Select **one**: 1 = yes 0 = no	● Yes = the meta-analysis provided some information on ELL status of children ● No = the meta-analysis did not provide any information on ELL status of children

English Learners (EL; ELL; ESL) and/or Limited English Proficient (LEP)	Number of Children	● Total number of participants identified as EL, ELL, LEP
SES or FRL Reported	Select **<u>one</u>**: 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 specific 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

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 to as pervasive developmental disorder; PDD) or risk of ASD	Number	● List number of students or studies with ASD/PDD 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 **<u>one</u>**: 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 **<u>all</u>** 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.

		Separate responses using a semi-colon (e.g., "1; 3; 4")	
BM	Study Dependency	Select **<u>one</u>** code: 0 = Not enough information provided to determine. 1 = Authors stated that they did not handle study dependency 2 = Did account for between study dependency 3 = Did account for within study dependency 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	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). 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). A little bit more about dependency from Borenstein et al. "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 infarc- tion. 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. 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

			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. Types of Disaggregated Data:	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
			  ○ 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):
			  ○ Disability versus Risk (when disability and risk are both included)
			  ○ Disability versus Typically Achieving (when disability was included)
			Risk versus Typically achieving (when risk 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.

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 If studies do not provide the N for each category but do state that some studies focused on these areas without a specific number, use an X	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.

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.