

Updates to the Version 4.1 Online Study Review Guide

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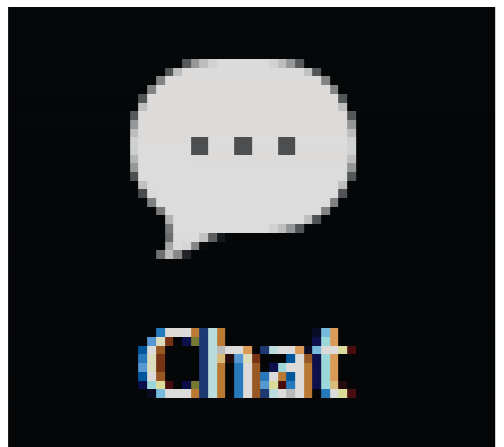


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Learning goals for this webinar



- Understand the key substantive and functional changes for the Version 4.1 Online Study Review Guide (OSRG).
- Understand the guidance and implications for using new OSRG input fields.
- Be aware of resources to help guide in conducting reviews in the Version 4.1 OSRG.

New statistical formulas in the Version 4.1 procedures

- With the v4.1 Procedures Handbook, the WWC now calculates standard errors to:
 - Weight studies in syntheses
 - Compute WWC p values
- A webinar in December 2020 covered the new statistical formulas in detail; today's webinar focuses on implications for OSRG users.
- Reviewers should be aware of the expanded options, especially for new OSRG input fields for implementing the new formulas.





Part 1: Entering effect size information

- Three principles for choosing the effect size computation option
- New version 4.1 input fields for covariate-adjusted comparisons
- Example application to a multiple regression model

Choosing the effect size computation type

The selection in the below drop-down menu determines which pieces of statistical information the OSRG will use in its computations.

Effect size computation 

- Select calculation - 
- Select calculation -
- Unadjusted mean and standard deviation
- t-stat
- Dichotomous
- ANOVA F-test
- ANCOVA adjusted post
- ANCOVA F-test & correlation
- OLS**
- HLM level-2 coefficient
- Favorable/Unfavorable designation only

Three principles for choosing the effect size computation option

- 1. Prefer adjusted over unadjusted analyses:** Compared to unadjusted differences, analyses that adjust for baseline differences generally should be preferred.
 - Includes regression models and analysis of covariance (ANCOVA).
- 2. The lack of reported information may constrain the computation choice:** For instance, unadjusted SDs must be entered to compute effect sizes using regression coefficients.
 - Whenever possible, it is important to select an option that allows for computing effect sizes; otherwise, the finding cannot contribute to the meta-analytic averages in cross-study syntheses.
- 3. Always select “dichotomous” for dichotomous outcomes:** Dichotomous outcomes require special formulas that do not apply to continuous outcomes.

Overview of effect size computation changes

OSRG display name	User-facing v4.1 changes
Unadjusted mean comparisons (continuous outcomes)	
Unadjusted mean and standard deviation	None
t-stat	None
ANOVA F-test	None
Covariate-adjusted comparisons (continuous outcomes)	
ANCOVA adjusted post	New input field for proportion variance explained (R^2)
ANCOVA F-test & correlation	Correlation input field replaced with R^2
Ordinary least squares (OLS)	Three new input fields (coefficient SE, coefficient test statistic, R^2)
HLM level-2 coefficient	Three new input fields (same as OLS above)
Dichotomous outcomes	
Dichotomous	None

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Dichotomous outcomes	
Dichotomous	None

Live OSRG demo of the new input fields for covariate adjustment

We will show:

- Where these new input fields appear
- How to interpret them when entering values

We will also show the v4.1 features for manually selecting attrition boundaries.

- Also entered on the *Measure* OSRG page (but not used to compute effect sizes).

A caution about distinguishing the two t -test input fields

Table 10. Impact of *focusMATH* on student math achievement

Coefficient	Standard Error	t -Value	p -Value	Effect Size	Percentile Difference
1.33	0.61	2.18	0.03	0.09	4

Effect size computation ?

OLS

Regression coefficient (unstandardized)

1.33

Coefficient standard error

0.61

Coefficient test statistic (t or z)

2.18

Proportion Variance Explained (R^2)

Effect size computation ?

t-stat

Tstat

**Do NOT enter here
(if representing a covariate-
adjusted comparison)**

Acceptable to enter here

- In this example, the $t = 2.18$ value came from a regression model controlling for covariates.
- As such, it should NOT be entered into the “t-stat” computation option, which is solely reserved for unadjusted comparisons.
- Entering covariate-adjusted t -test statistics for the “t-stat” option will yield WWC effect sizes that are too large.

Required fields for covariate-adjusted computation options

OSRG display name	Required fields to compute effect sizes
ANCOVA adjusted post	Adjusted means, unadjusted standard deviations
ANCOVA F-test & correlation	<i>F</i> -test value, R^2
OLS	Unstandardized coefficient, unadjusted standard deviations
HLM level-2 coefficient	Unstandardized coefficient, unadjusted standard deviations

Note that the new Version 4.1 fields (R^2 or coefficient standard error) are generally not required fields, but they should still be entered (if available).

Part 2: Changes to cluster correction fields

- Overview of changes to cluster corrections in Version 4.1
- Addressing whether the authors' analysis accounted for clustering
- Entering the intracluster correlation coefficient

Applying cluster corrections in the OSRG

Cluster-level assignment studies have special considerations for computing standard errors and p values.

Is this an analysis with cluster level assignment? 

Yes No 

Version 4.1 of the *WWC Procedures Handbook* and its supplement included improved statistical formulas for cluster-level assignment studies. Answers to the above OSRG question will trigger using such formulas.

December 2020 changes to the OSRG include:

- Incorporating the new statistical formulas (version 4.1)
- Improving the user interface (version 4.1 and earlier)
- Demo will focus on three user interface improvements (applying to all versions)

Live OSRG demo of changes to cluster corrections user interface

1. Moved the “Did the analysis account for clusters?” question to appear directly beneath the specific statistics (such as F and t values) it corresponds to.
2. Fixed an error that prevented the OSRG from applying appropriate cluster corrections to WWC calculations in certain circumstances.
3. Made the intracluster cluster correlation (ICC) field now always appear for cluster-level assignment studies, regardless of the answer to the “Did the analysis account for clusters?” question.

Part 3: Aggregating findings within a single study

1. Two ways of aggregating multiple findings in a study
2. Live OSRG demo on entering correlations between findings
3. General principles for entering correlations

Aggregate multiple findings from a study

The OSRG provides two ways of aggregating multiple findings from a study:

1. Aggregate unadjusted means from two or more subsamples for a single outcome measure.
 - a. Example: Woodcock-Johnson math test score unadjusted means for boys and girls.
 - b. Applicable if the study authors did not provide the full sample finding.
2. Aggregate multiple main findings in an outcome domain, which accommodates both:
 - a. Correlated outcome measures
 - b. Subsample findings that cannot be aggregating using Option 1

Only this option changes with Version 4.1

Live OSRG demo adding correlations in the OSRG

The Version 4.1 updates now allow the reviewers to enter correlations between main findings.

The OSRG will incorporate these correlations into the computation of the domain-level standard error.

Summary of findings that meet standards

Outcome domain	Sample size	Improvement index	Characterization of findings	Standard Error	
Domain average for Alphabetics	400 s	+34	Statistically significant positive effect	0.106	Add Correlation
Domain average for General Mathematics Achievement	400 s	+35	Statistically significant positive effect	0.107	Add Correlation

This new button will open a pop-up window for entering correlations

Interpreting the correlation matrix input fields

OSRG Display

Update Domain Correlations

Domain average for General Mathematics Achievement

Correlation

0.56	
0.64	

Delete Save Cancel

Interpret as:

	1.	2.	3.
1.			
2.	0.56		
3.	0.64		

Interpreting the correlation matrix input fields

Enter the correlations based on the order listed on the summary of main findings table.

Correlation Matrix Numbering

	1.	2.	3.
1.			
2.	0.56		
3.	0.64		



Listing of Individual Main Findings

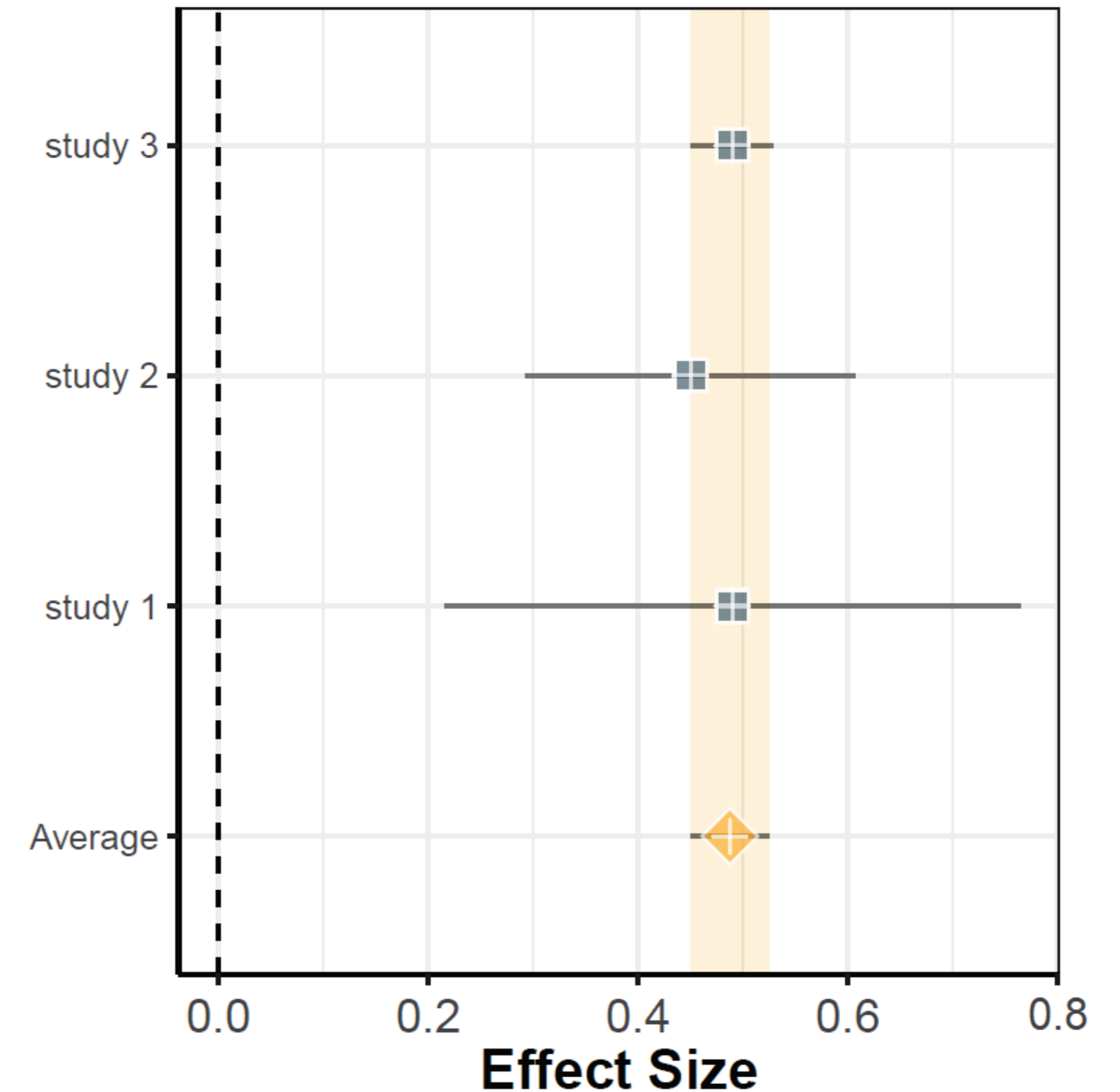
Domain average for General Mathematics Achievement							1.05	+35	Statistically significant
Main									
1	Early Childhood Longitudinal Study-Kindergarten (ECLS-K) Math Assessment	Full sample	400 students	20.00 (5.00)	15.00 (5.00)	5.00	0.998	+34	0.000
2	Woodcock-Johnson III (WJ-III): Applied Problems subtest	Full sample	400 students	35.00 (4.00)	32.00 (3.00)	3.00	0.847	+30	0.000
3	Texas Early Mathematics Inventories-Outcome Mathematics Problem Solving (MPS)	Full sample	400 students	45.00 (2.00)	40.00 (5.00)	5.00	1.311	+41	0.000
MCC: A multiple comparisons correction is applied in all cases where there are multiple main findings within the same outcome domain									

Part 4: Synthesizing findings across studies

1. Reminder of changes for intervention effectiveness ratings
2. Additional display fields in the OSRG

Version 4.1 procedures for synthesizing

- Version 4.1 procedures use a fixed-effects meta-analysis approach to compute a weighted average effect size.
- More precisely estimated effects (larger sample sizes, smaller standard error) get more meta-analytic weight.
- The Version 4.1 intervention effectiveness ratings are based on three considerations:
 - ✓ Number of studies (one vs. multiple)
 - ✓ Meta-analytic average and its statistical significance
 - ✓ Proportion of meta-analytic weights from studies with the highest WWC rating (Meets Without Reservations)



Synthesis of studies in the OSRG

The v4.0 OSRG determined the qualitative rating of intervention effectiveness (synthesizing across studies):

Summary of findings

Outcome domain	Rating of effectiveness	Improvement index	Number of studies	Number of students
Credit accumulation	no discernible effects	-1	1	42894
Industry-recognized credential, certificate, or license completion	positive effects	18	3	44367
Short-Term Earnings	potentially positive effects	0	2	2519
Short-Term Employment	potentially positive effects	10	1	2064

The v4.1 OSRG updated the rating logic, along with adding the meta-analytic effect size and standard error:

Summary of findings

Outcome domain	Rating of effectiveness	Effect size	Standard error	Improvement index	Number of studies	Number of students
Credit accumulation	Uncertain effects	-0.03	0.02	-1	1	42894
Industry-recognized credential, certificate, or license completion	Potentially positive effects	0.49	0.02	18	3	44367
Short-Term Earnings	Uncertain effects	0.00	0.08	0	2	2519
Short-Term Employment	Potentially positive effects	0.27	0.05	10	1	2064

Updated logic

New to Version 4.1

Questions?



Have questions? Contact us: <https://ies.ed.gov/ncee/wwc/help>



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OSRG Version 4.1 resources

The OSRG Resources Library includes the following at <https://members.nces.ed.gov/OSRG/>:

- User guide containing a summary of changes to the OSRG for Version 4.1
- User guide for aggregating findings in the Version 4.1 OSRG
- Version 4.1 Study Review Protocol