

## What Works Clearinghouse™ Resources You Can Use

# ***Designing Quasi-Experiments: Meeting What Works Clearinghouse Standards Without Random Assignment***

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## Today's Speakers

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## Webinar Overview

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- ▶ **The What Works Clearinghouse (WWC) and standards**
- ▶ **Quasi-experimental designs (QEDs)**
  - Characteristics of high-quality QEDs
  - Tips and cautions
- ▶ **Resources**
- ▶ **Staying informed and Q&A with participants**

# WWC: Who, What, and Why

## Who we are:

- ▶ An initiative of the Institute of Education Sciences (IES) at the U.S. Department of Education

## What we do:

- ▶ We review the research in education to answer the question **“What works in education?”**

## Why we do it:

- ▶ To provide educators with the information to **make evidence-based decisions**

The screenshot displays the homepage of the What Works Clearinghouse (WWC) website. At the top, the IES logo and the title 'WHAT WORKS CLEARINGHOUSE' are visible, along with a search bar. The navigation menu includes links for Home, Topics in Education, Publications & Reviews, Find What Works!, Inside the WWC, News & Events, and About Us.

The main content area features a large banner for 'New video materials based on the Improving Reading Comprehension in Kindergarten Through 3rd Grade practice guide are now available'. Below this, there are three main sections:

- Publications & Reviews:** This section highlights '10310 studies reviewed!' and lists several WWC products: Practice guides, Intervention reports, Single study reviews, Quick reviews, and The studies database. It also includes a search bar for topics in education.
- Find What Works!:** This section provides a tool for finding research evidence, with a diagram showing the process from 'Identify the problem' to 'Find the evidence' and 'Evaluate the evidence'. It lists goals such as improving literacy skills, increasing math achievement, reducing dropout rates, and helping students with special needs.
- Evidence for What Works in Education:** This section explains the WWC's mission to review research on different programs, products, practices, and policies. It states that the goal is to provide educators with information to make evidence-based decisions.

On the right side, there is a 'WWC Fact Check: Test Your Knowledge...' section with a 'True' or 'False' question, and a 'What's New?' section with links to recent news items like 'A Webinar for Faculty of Principal and Teacher Preparation Programs' and 'Study of Display Modes in iPad's Solar Walk Application Meets WWC Standards'.

# WWC Evidence Standards Identify Rigorous Evidence

- ▶ **Developed by panels of national experts**
- ▶ Focus on **causal validity** of the study design and analysis (important contextual factors are described)
- ▶ Applied to each study by **independent, certified reviewers**
- ▶ Result is a **study rating**
  - *Meets WWC Group Design Standards without Reservations*
  - *Meets WWC Group Design Standards with Reservations*
  - *Does Not Meet WWC Group Design Standards*

# Features of Comparison Group Designs

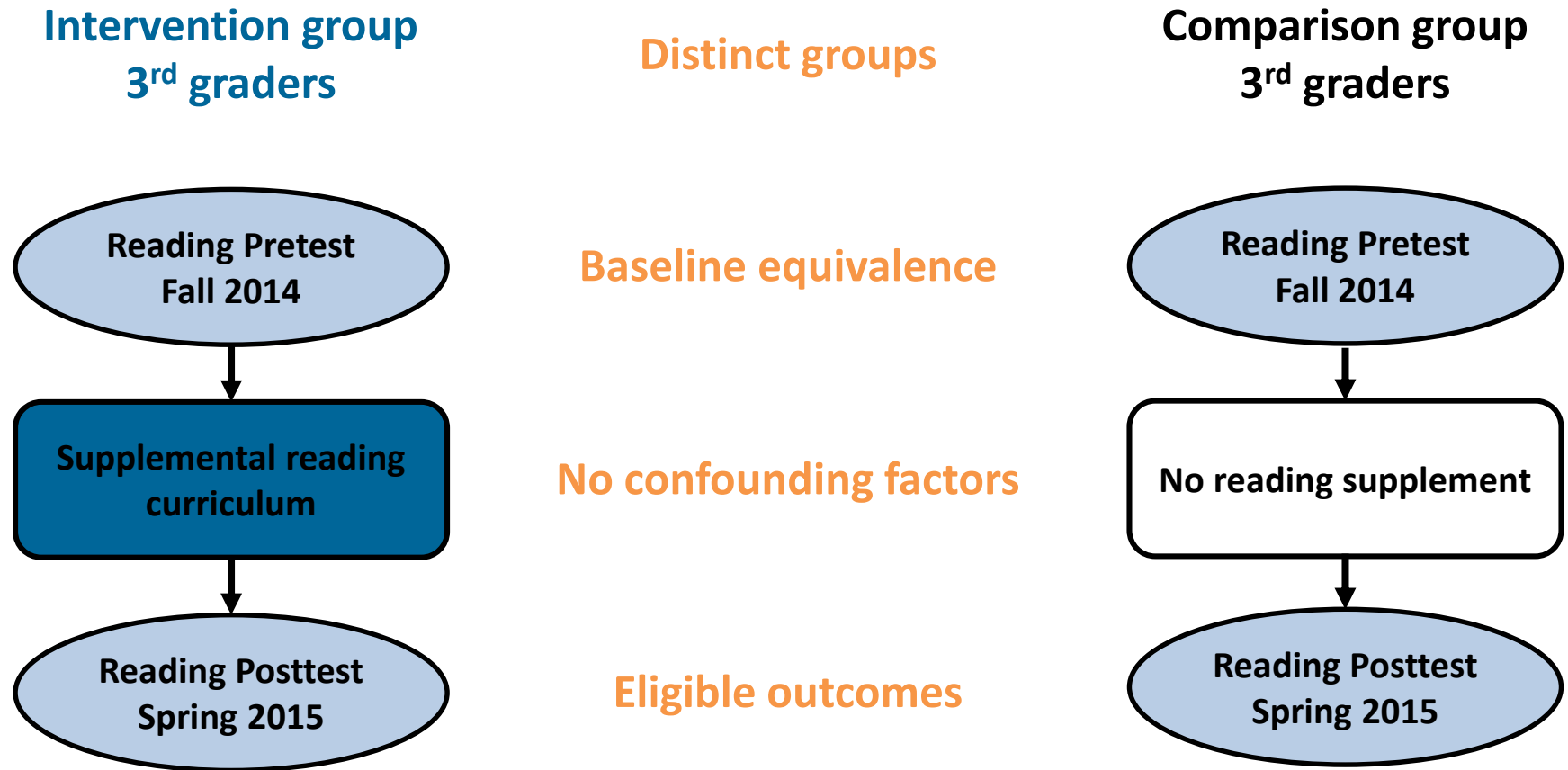
## Randomized Controlled Trials (RCTs)

- ▶ **Randomly assigned** to treatment or comparison group
- ▶ Created similar on **observables** and **unobservables**
- ▶ Outcome differences due **only to intervention**
- ▶ **Can receive highest rating**, *Meets Group Design Standards Without Reservations*

## Quasi-Experimental Designs (QEDs)

- ▶ **Assignment not random** – some receive treatment and some do not
- ▶ Can demonstrate similar **only on observables**
- ▶ Outcome differences possibly due to **intervention and other factors**
- ▶ *Can Meet Group Design Standards With Reservations*, but **cannot receive highest rating**

# The High-Quality Quasi-Experimental Design



# Distinct Groups

**Intervention group**  
**3<sup>rd</sup> graders**

**Distinct groups**

**Comparison group**  
**3<sup>rd</sup> graders**

- ▶ At least **two groups** (one intervention and one comparison)
  - **Not** a group compared to itself (same students in grades 3 and 4)
- ▶ Created **non-randomly**
  - Convenience sample
  - Propensity score matching
  - Retrospective

# Baseline Equivalence



- ▶ Differences before intervention could carry through to outcomes
- ▶ Demonstrate groups were **similar prior to intervention** (at baseline)
  - Specific characteristics listed in each review protocol; including proxies
- ▶ WWC looks at the size of the difference
  - Effect size (ES) units – see *Handbook* for calculation
  - **Statistical adjustment** – pretest as covariate, not gain score or diff-in-diff

0.00 ≤ ES Difference ≤ 0.05	0.05 < ES Difference ≤ 0.25	ES Difference > 0.25
Satisfies baseline equivalence	Statistical adjustment required to satisfy baseline equivalence	Does not satisfy baseline equivalence

## No Confounding Factors

Supplemental reading  
curriculum

No confounding factors

No reading supplement

- ▶ A component **completely aligned with only one study condition**
  - Impossible to separate effect of intervention and confounding factor
  - Cannot attribute impact solely to intervention
  - *Study Does Not Meet WWC Group Design Standards*
- ▶ Common confounds
  - **Single unit** (school, classroom, teacher) in one or both conditions
  - **Person delivering intervention** has no contact with comparison group
  - Intervention is **bundled** with other services not being studied
  - Treatment and comparison occur at **different points in time**

## Eligible Outcomes

Reading Posttest  
Spring 2015

Eligible outcomes

Reading Posttest  
Spring 2015

- ▶ Used to determine the **impact of the intervention**
- ▶ Eligible outcomes (and data) have the following characteristics:
  - **Face validity** – measures what it is supposed to measure
  - **Reliability** – measures things consistently
  - Not **overaligned** with the intervention
  - **Collected in a similar manner** across groups
  - **No imputation** of missing data

## Take 5: Things to Keep in Mind About QEDs

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- ▶ Start with at least two **distinct groups**, one intervention and one comparison
- ▶ Assess **baseline equivalence** and **statistically adjust** if necessary
- ▶ Avoid **confounding factors** such as single units or bundled interventions
- ▶ Collect data on **eligible outcomes** before and after the intervention
- ▶ Clearly **document** sample, data collection, analytic procedures, and findings

# Resources

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▶ **WWC Procedures and Standards Handbook**

- <http://ies.ed.gov/ncee/wwc/DocumentSum.aspx?sid=19>

▶ **WWC Reporting Guide for Study Authors**

- [http://ies.ed.gov/ncee/wwc/pdf/reference\\_resources/wwc\\_gsa\\_v1.pdf](http://ies.ed.gov/ncee/wwc/pdf/reference_resources/wwc_gsa_v1.pdf)

▶ **WWC Study Review Guide and Instructions**

- <http://ies.ed.gov/ncee/wwc/StudyReviewGuide.aspx>

▶ **WWC Review Protocols**

- [http://ies.ed.gov/ncee/wwc/Publications\\_Reviews.aspx?f=All%20Publication%20and%20Review%20Types,5;#pubsearch](http://ies.ed.gov/ncee/wwc/Publications_Reviews.aspx?f=All%20Publication%20and%20Review%20Types,5;#pubsearch)

▶ **WWC Database of Reviewed Studies**

- <http://ies.ed.gov/ncee/wwc/ReviewedStudies.aspx>

## Stay Informed

An upcoming **topical bulletin** will highlight the WWC **review process** and **key resources**

To receive regular updates:



**Facebook:**

<http://facebook.com/whatworksclearinghouse>



**Twitter:**

<https://twitter.com/WhatWorksED>



**Email Newsflash:**

<http://ies.ed.gov/newsflash/?url=%2Fncee%2Fwwc%2Findex%2Easp&site=What+Works+Clearinghouse>



## Help Improve the WWC

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**Send suggestions to:**

**What Works Clearinghouse Help Desk**

<http://ies.ed.gov/ncee/wwc/ContactUs.aspx>



**Questions and Answers**