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

- 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
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

**Intervention group**
- 3rd graders
- Reading Pretest | Fall 2014
- Supplemental reading curriculum
- Reading Posttest | Spring 2015

**Distinct groups**
- Baseline equivalence
- No confounding factors
- Eligible outcomes

**Comparison group**
- 3rd graders
- Reading Pretest | Fall 2014
- No reading supplement
- Reading Posttest | Spring 2015
**Distinct Groups**

<table>
<thead>
<tr>
<th>Intervention group 3rd graders</th>
<th>Distinct groups</th>
<th>Comparison group 3rd graders</th>
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</thead>
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- 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

<table>
<thead>
<tr>
<th>ES Difference</th>
<th>Satisfies baseline equivalence</th>
<th>Statistical adjustment required to satisfy baseline equivalence</th>
<th>Does not satisfy baseline equivalence</th>
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</thead>
<tbody>
<tr>
<td>0.00 ≤ ES Difference ≤ 0.05</td>
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<td>Does not satisfy baseline equivalence</td>
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<td>0.05 &lt; ES Difference ≤ 0.25</td>
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<td>ES Difference &gt; 0.25</td>
<td>Does not satisfy baseline equivalence</td>
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No Confounding Factors

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**

**No confounding factors**

**Supplemental reading curriculum**

**No reading supplement**
Eligible Outcomes

- 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

- Start with at least two **distinct groups**, one intervention and one comparison
- Assess **baseline equivalence** and **statistically adjust** if necessary
- Avoid **con founding 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

- **WWC Procedures and Standards Handbook**

- **WWC Reporting Guide for Study Authors**

- **WWC Study Review Guide and Instructions**

- **WWC Review Protocols**

- **WWC Database of Reviewed Studies**
Stay Informed

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

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Help Improve the WWC

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

Questions and Answers