# Evaluation Designs

## Pre-Experimental Designs

### One shot case study
- Used to measure an outcome after an intervention is implemented; often to measure use of a new program or service
- One group receives the intervention
- Data gathered at one time point after the intervention
- *Design weakness*: does not prove there is a cause and effect relationship between the intervention and outcomes

<table>
<thead>
<tr>
<th></th>
<th>O₁</th>
<th>X</th>
<th>O₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>One shot</td>
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### One group pretest-posttest
- Used to measure change in an outcome before and after an intervention is implemented
- One group receives the intervention
- Data gathered at 2+ time points
- *Design weakness*: shows that change occurred, but does not account for an event, maturation, or altered survey methods that could occur between data points

<table>
<thead>
<tr>
<th>O₁</th>
<th>X</th>
<th>O₂</th>
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<tbody>
<tr>
<td>One group</td>
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### Static group comparison
- Used to measure an outcome after an intervention is implemented
- Two non-randomly assigned groups, one that received the intervention and one that did not *(control)*
- Data gathered at one time point after the intervention
- *Design weakness*: shows that change occurred, but participant selection could result in groups that differ on relevant variables

<table>
<thead>
<tr>
<th>NR</th>
<th>X</th>
<th>O₁</th>
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<tr>
<td>Nonrandomized</td>
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**Diagram Key:**

- **Oₙ** = observation
- **X** = intervention/treatment/program/service
- **R** = randomized
- **NR** = nonrandomized
## Quasi-Experimental Designs

### Separate sample pretest-posttest
- One group receives the intervention and data is gathered from two different samples from that group (requires a random sample)
- Data gathered at 2+ time points, before and after the intervention
- *Design weakness:* shows that change occurred, but participant selection could result in samples that differ on relevant variables

![Diagram of Separate sample pretest-posttest]

### Non-equivalent control group with pretest-posttest
- Used to measure change in an outcome after an intervention
- Two non-randomly assigned groups, one that received the program and one that did not
- Data gathered at 2+ time points, before and after the intervention
- *Design weakness:* shows that change occurred, but participant selection could result in groups that differ on relevant variables

![Diagram of Non-equivalent control group with pretest-posttest]

### Interrupted time series
- Used to measure trends over time before and after an intervention is implemented
- One assigned group that received the intervention
- Data gathered at multiple time points (i.e., Behavioral Risk Factor Surveillance System)
- *Design weakness:* shows that change occurred, but does not account for an event, maturation, or altered survey methods that could occur between data points

![Diagram of Interrupted time series]

### Multiple time series
- Used to measure trends over time before and after an intervention is implemented
- Two non-randomly assigned groups, one that received the intervention, and one that did not
- Data gathered at multiple time points (i.e., Behavioral Risk Factor Surveillance System)
- *Design weakness:* shows that change occurred, but participant selection could result in groups that differ on relevant variables

![Diagram of Multiple time series]
**True Experimental Designs**

**Posttest only control group**
- Used to measure an outcome after an intervention
- Two randomly assigned groups, one that received the program and one that did not
- Data gathered at one time point, after the intervention
- *Design weakness*: shows that change occurred, but does not prove a cause and effect relationship between the intervention and outcomes

**Pretest-posttest control group**
- Used to measure change in an outcome before and after an intervention
- Two randomly assigned groups, one that received the intervention and one that did not
- Data gathered at 2+ time points, before and after the intervention
- Best design for proving a cause and effect relationship between the intervention and outcomes

**Resources:**

Brewer, N. (September 27, 2011). Observational Research Designs. Lecture conducted from the University of North Carolina at Chapel Hill.

Brewer, N. (November 2, 2011). True and Pre-Experimental Designs for Evaluation. Lecture conducted from the University of North Carolina at Chapel Hill.

Brewer, N. (November 8, 2011). Quasi-Experimental Study Designs. Lecture conducted from the University of North Carolina at Chapel Hill.