Using Randomized Controlled Trials in Criminal Justice

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Webinar Agenda

• Welcome

• Introduction to experimental design
  – Key features of Randomized Controlled Trials
  – Advantages and disadvantages
  – Methodological, ethical, and practical considerations

• Policing interventions and the RCT
  – Examples from the real world

• Conclusions
  – Biggest challenges
  – Why is it important

• Dr. Brenda Buren, Director, Tempe Police Department
  – Practitioner perspective on rigorous research designs
Why are RCTs Important?

• 21st century policing is evidence-based policing

• Rigorous research tells us what works and what doesn’t

• Filling the “Tool Box” with tools that work
  – Crimesolutions.gov
  – George Mason Evidence-Based Policing Matrix
Introduction to Experimental Design
What is an Experiment?

• Experiments are a natural way of learning

• The basic idea of an experiment is the same no matter what you are investigating:
  – The researcher collects evidence to assess whether any change in the outcome of interest is due to the intervention and not other causes

Randomized Controlled Trials Principles

- Random assignment of participants or cases to control and experimental groups
- Implementation of treatment or intervention to the experimental group
- No treatment (or implementation of standard treatment) to control group
- Comparison of outcomes on a dependent variable for the experimental and control groups, pre- and post-implementation
## Cause and Effect: What are the Standards?

- **Maryland Scientific Method Scale (SMS) (Sherman et al., 1997)**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Correlation between intervention and an outcome (e.g., crime) at one point in time.</td>
</tr>
<tr>
<td>2</td>
<td>Measures of outcome before and after intervention, with no comparable control conditions</td>
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<tr>
<td>3</td>
<td>Measures of outcome before and after intervention in two conditions (1 that received intervention, 1 that did not)</td>
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<tr>
<td>4</td>
<td>Measures of outcome before and after intervention in treatment and comparison units, controlling for other variables</td>
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Cause and Effect: What are the Standards?

- Maryland Scientific Method Scale (SMS) (Sherman et al., 1997)

  Level 1
  - Correlation between intervention and an outcome (e.g., crime) at one point in time.

  Level 2
  - Measures of outcome before and after intervention, with no comparable control conditions

  Level 3
  - Measures of outcome before and after intervention in two conditions (1 that received intervention, 1 that did not)

  Level 4
  - Measures of outcome before and after intervention in treatment and comparison units, controlling for other variables

  Level 5
  - Random assignment of intervention to treatment and control conditions
The Gold Standard

• RCTs are considered the gold standard of scientific research (level 5 in SMS)
  – Random assignment makes treatment and control groups equivalent
  – Thus we can safely assume that changes in the outcome variable are due to the intervention
When is RCT a Good Option?

- Can the variables of interest be manipulated practically? Ethically?
- Would an experimental intervention distort the object of the investigation?
- Is the research more concerned with causal processes or outcomes?
- Can cases, subjects, areas or participants be randomly assigned?
## Advantages and Disadvantages of RCTs

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<tr>
<th>Feature</th>
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<th>Disadvantage</th>
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<td>Random assignment</td>
<td>Controls for factors external to the intervention.</td>
<td>Many research topics are not susceptible to random assignment.</td>
</tr>
<tr>
<td>Manipulable variables</td>
<td>Presence, duration, and intensity of intervention are determined by researchers.</td>
<td>Many variables are impossible or difficult to manipulate (ethical?).</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Better at investigating short-term, relatively uncomplicated interventions.</td>
<td>Long-term effects may be obscured by the history threat to validity.</td>
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## Advantages and Disadvantages of RCTs

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<td>Artificiality of treatments</td>
<td>Keeps contaminating influences to a minimum.</td>
<td>Can be too distinct from real-world complexities (too short-term and too mild).</td>
</tr>
<tr>
<td>Validity</td>
<td>Best for internal validity of conclusions.</td>
<td>Often less strong for external validity or generalizability.</td>
</tr>
<tr>
<td>Causation</td>
<td>Often the strongest design for identifying causal outcomes.</td>
<td>Often less effective at discovering causal processes.</td>
</tr>
</tbody>
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Methodological Considerations

• Fidelity:
  – Was the intended intervention actually delivered?
  – Was it delivered according to the specifications in the design?

• Conduct manipulation checks:
  – Was the intervention strong enough or consistent enough to have the intended effect?

• Statistical power:
  – Was the size of the experimental and control groups large enough to estimate statistical significance?
Ethical and Practical Considerations

• RCTs in institutional settings
• Cost and buy-in
• Withholding treatment from needy populations
• Contamination and spill-over effects
Stop and Talk

Questions?
Comments?
Ethical and Practical Considerations

An Illustrative Example

• Effect of TASER exposure on cognitive functioning
  – How do you ethically and practically “taze” college students?
Policing Interventions and RCT: Examples from the Real World
The RCT Principles

• What can be randomized?
  – Most commonly places and people

• What can be a “treatment” or intervention?
  – Just about anything: body-worn cameras, use of DNA in property crime investigations, a policing strategy (POP, COP), types or levels of patrol, formal activity (arrest, mediation, etc.)

• What can be the outcome of interest (or dependent variable)?
  – Examples: arrests (recidivism), clearance, crime, use of force, citizen satisfaction, police legitimacy
Minneapolis Domestic Violence Experiment

- What was randomized?
  - Domestic violence calls

- What was the treatment?
  - Case outcomes: arrest, separation, counseling (color-coded pad)

- What was the outcome of interest?
  - Recidivism of offenders (future domestic violence)
  - Does arrest decrease likelihood of subsequent domestic violence arrests/offenses?

- Findings…

Source: Sherman & Berk 1984
Philadelphia Smart Policing Initiative

• What was randomized?
  – Crime hot spots

• What was the treatment?
  – Police officer activity—POP, targeted offenders, foot patrol (what should cops do in hot spots)?

• What was the outcome of interest?
  – Crime

• Findings…
Spokane/Tempe Body-Worn Camera Study

• What was randomized?
  – Police officers
• What was the treatment?
  – Body-worn cameras (BWCs)
• What was the outcome of interest?
  – Use of force, citizen complaints, citizen perceptions of procedural justice
  – Do BWCs lead to reduced levels of force and citizen complaints? And higher levels of procedural justice?
• Findings…
Returning to the Challenges

• Is randomization practical? Ethical?
  – People are deprived of the intervention for the sake of science

• Contamination
  – Control people/places are exposed to the treatment

• Implementation
  – Are the protocols followed by the officers?
Discussion: The Practitioner Perspective on Rigorous Research Designs

Dr. Brenda Buren
Director
Tempe Police Department
Stop and Talk

Questions?
Comments?