

Understanding Variation in Treatment Effects: Musings on Quantitative Methods

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Peter Z. Schochet, Senior Fellow

Papers Use the Full Range of Methods

- **Moderator analyses (Morris, Kling)**
- **Symmetrically-predicted endogenous subgroups (ASPES; Peck)**
- **Principal stratification (PS; Page et al.)**
- **Mediation analyses (Kling)**

Overview of Musings

- **Which methods should be used and when?**
- **What are similarities and differences of the methods?**
- **What are key methodological issues?**
- **Final comments**

Which Methods to Use?

- All disaggregate full sample impacts into *“component”* parts to assess variation in impacts
 - Many are subgroup analyses
- Provide complementary information
- Choice of methods should be based on
 - Primary research questions from the evaluation’s logic model
 - Available baseline, service receipt, and mediator data
 - Plausibility of identifying assumptions

Broad Categorization of Methods

- **Moderator analyses**
 - Based on pre-intervention characteristics
 - Individuals and sites
 - Broader target population
- **ASPES, PS, and mediation analyses**
 - Based on post-intervention measures
 - Program-related and other experiences after random assignment
 - Short-term (mediating) outcomes

What Distinguishes the ASPES, PS, and Mediation Analyses?

- **ASPES**

- Mediators are available for **one** research group only

- e.g., Receipt of specific intervention services by treatment group
- Directly predict mediators for the other research group

- **PS and mediation analyses**

- Mediators are available for **both** research groups

- e.g., Teacher practices; child care decisions; depression indices
- Do not know mediator values in the other research condition
- Use impacts on mediators to link mediators to longer-term outcomes

What Distinguishes PS and Mediation Analyses?

- **Mediation analyses**

- **Motivation:** Mediators may be correlated with long-term outcomes
- **Questions:**
 - What are these linkages?
 - To what extent do impacts on mediators explain impacts on longer-term outcomes?

- **PS analyses**

- **Motivation:** The intervention is likely to change mediator values more for some people than others
- **Question:**
 - What are intervention effects on long-term outcomes for the subgroup whose mediator values were improved by the intervention?

Methods Rely on Key Assumptions

- **Moderator analyses**
 - Based fully on the experimental design
- **ASPES**
 - Need *high quality baseline data* for predicting mediators
- **Mediation Analyses**
 - Standard OLS approaches assume *mediator ignorability*
 - IV approaches invoke the *exclusion restriction*
 - Difficult to recover average mediated effects for the population
- **PS Analyses**
 - Requires *distributional assumptions* on potential outcomes

Ways to Improve Analyses

- **Collect detailed baseline data**
- **Focus the analysis on key mediators and moderators that align with the conceptual model**

Final Comments

- **Methods show promise for understanding variation in treatment effects**
 - Need more empirical work
 - Need tools, such as computer programs
- **Results must be interpreted carefully**
 - Apply to subgroups, not necessarily to the full sample
 - Hinge on credibility of assumptions
 - Statistical power could be an issue
 - Important to avoid fishing for positive findings

For More Discussion

- Peter Z. Schochet
pschochet@mathematica-mpr.com