Evaluation
A Systematic Approach

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Chapter 9:
Detecting, Interpreting, and Exploring Program Effects

The Magnitude of a Program Effect

- Small effects are more difficult to detect than larger ones.
- Difference on the outcome between treatment and no treatment

The Magnitude of a Program Effect

- Percentage increase or decrease
- Effect size statistic
- Standardized mean difference
- Odds ratio

The Magnitude of a Program Effect

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- Standardized Mean Difference
  - Appropriate with continuous outcome measures
  - Positive value when the outcome is more favorable

The Magnitude of a Program Effect

- Odds Ratio
  - Binary outcome measure
  - Configured in a 2x2 table

The Magnitude of a Program Effect

- Odds Ratio

	Positive Outcome	Negative Outcome
Intervention group	p	1 – p
Control group	q	1 – q

Peter H. Rossi and Gary T. Henry, Evaluation: A Systematic Approach 8e. SAGE Publishing, 2019.

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Detecting Program Effects

- Valence

- Magnitude

- Minimum detectable effect size

Detecting Program Effects
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- Practical Significance
  - Translate statistical effects into relevant terms
  - May need an external frame of reference
  - Pre-established threshold value
  - Similar programs

Detecting Program Effects

- Practical Significance
  - Difference on the Original Measurement Scale
  - Comparison with Test Norms or Performance of a Normative Population
  - Differences between Criterion Groups

Detecting Program Effects

- Practical Significance
    - Proportion over a Diagnostic Success Threshold
    - Proportion over an Arbitrary Success Threshold
    - Comparison with Similar Programs
    - Conventional Guidelines

Detecting Program Effects
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- Statistical Significance
  - Measurement error
  - Sampling error
  - Sample size

Detecting Program Effects

- Statistical Power
    - The effect size to be detected
    - The alpha level threshold for statistical significance
    - The sample size
    - The statistical significance test used

Detecting Program Effects

- Statistical Power
  - Type I error
  - Type II error

Detecting Program Effects
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- Statistical Power
  - Effective sample size
  - Intra-class correlation coefficient (ICC)

Examining Variation in Program Effects
(1 of 3)

- Program effects are rarely identical for all the subgroups in a target population or for all outcomes.

- Moderator variables

Examining Variation in Program Effects
(2 of 3)

- Moderator Analysis
  - Gender
  - Age
  - Race/ethnicity
  - Socioeconomic status
  - Others

Examining Variation in Program Effects
(3 of 3)

- Mediator Analysis
  - Mediator variable
  - Comes between program exposure and some key outcome

The Role of Meta-Analysis
(1 of 3)

- Collect all reports on prespecified criteria
  - Type of program
  - Nature of study samples
  - Region
  - Dates of research

The Role of Meta-Analysis

- Informing an Impact Assessment
  - Overall mean effect size for a program area
  - Can appraise the magnitude of the program effects that have been found in the study
  - May offer some clues about what features of the program are most critical

The Role of Meta-Analysis
(3 of 3)

- Informing the Evaluation Field
  - Meta-analysis is one of the principal means
  - The evaluation field becomes a stakeholder in every evaluation