Metastudies
Definition

• quantitative techniques
• synthesizing results from many types of research
  – opinion surveys
  – correlations
  – experimental
  – quasi-experimental
Combined Tests

• 1930s
  – combine probability levels
  – find experiments of homogenous results, then combine

• combining results
  – if null hypothesis is true for all studies
  – then p values from statistical results from all studies are uniformly distributed
Combined Tests - more

• combining treatment effects
  – reconstruct the means, sample size and mean squares within conditions for all studies
  – then combine the data into overall analysis
Quantitative Reviews

• counting results
  – positive and negative

• percentages of outcomes
  – results from all studies reported in percentage terms
    • use parametric statistics
  – percent scores for each study and use that score for

• correlations as outcomes
  – correlations are indices of relationship
meta-analysis

- primary analysis
  - well noted

- secondary analysis

- quantitative treatment of review results
  - statistical analysis of quantitative summaries of individual experiments for the purpose of integrating the findings
Characteristics of meta-analysis

- covers review results
- applied to summary statistics
- large number of studies
- handful of studies - mini-analysis
- size of treatment effects
- relations between study features and outcomes
Notables

• Gene Glass - President AERA 1976
• Hedges
  – modern statistical measures
• Hunter and Schmidt
  – state of art of meta-analysis
• Rosenthal
  – taxonomy of meta-analysis methods
• Slavin
  – best evidence research methods
Other Definitions

• Rosenthal
  – any attempt to combine or compare statistical results from two or more studies
  – taxonomy - use of appropriate statistics
    • combinations or comparisons
    • effect sizes or probabilities
    • two or more studies

• Slavin
  – statistical treatment and logical analysis of a small number of studies considered most
Examples

• class size and student learning
  – 400 studies
  – reduced results to common terms
  – carefully reviewed factors to effect study
  – new statistical analysis (regressions)
Contributions

• made unit free studies by standardizing results
• the number of pertinent studies is large
• could review many study features
  – methods, settings, characteristics of publications
• new statistical methods
  – regressions to relate size of treatment effect to therapy
Criticisms

• too much attention to low quality studies
• too dependent on published results
• mix of apples and oranges
• multiple results from same studies
Findings Studies

- systematic
- design
- beyond their own or students
- the review area
  - often too loosely defined in meta-analysis
  - different things to different people
  - include everything or restrict
Guidelines

- how were studies located
- how were studies selected
- are all selected studies relevant
- how were features coded
- were statistical methods used
- were sample sizes inflated
Stages

• problem formulation
• data collection
  – online databases
    • recent or unpublished
  – reference lists or journal articles
    • journal biases
• data retrieval and evaluations
• analysis and interpretation
Process

• criteria for selection
  – too restrictive might yield more study needed
• screening
  – all studies of an issue
  – only the best
• describing
  – use a code sheet
  – do statistical analysis on features
• what to code
Describing outcomes

- effect size measure of magnitude of treatment effect on dependent variable expressed so that many studies can be compared

- standardized mean difference between outcome scores of experimental and control

- use interpretable outcomes
  - operative - treatment effect in raw units (y units)( by either standard deviations of y or by standard deviation from which sources of
Analyzing the results

• using studies as sample size
• using study findings as sample size
  – prepared meta-analysis on various measures in questions
Design and Publication Features

• what relationships were found
• what was found
• how strong are the relationships
• what might cause the relationships
Role of Publications

• journals Vs dissertations
  – journals more positive
  – publication bias
  – research experience
  – professional status

• long term Vs short term
  – usually show stronger results in short term
    • novelty
    • Hawthorne
    • carefully controlled