

Tip Sheet: Longitudinal Design

Stephanie Montañó and Emily Huang (2014)

Basics

Longitudinal Design is: A correlational research study that involves repeated observations of the same variables over long periods of time (often decades)

Key Question: How changes over time on outcome differ based on program participation?

Study Designs

Some designs lend themselves to longitudinal evaluations better than others. Biggest issue for this design is attrition.

Study Design	Pros	Cons
Cohort or Sequential Studies: Follow a group experiencing some event in a selected time period and study at intervals through time	"Gold standard," generalizable, most even distribution of confounders; timing and directionality established Useful for exploratory studies, not expensive or time-consuming	Unscheduled sample attrition with the passage of time may cause biases in the data since not all individuals are equally likely to be lost. Limited generalizability because it was not a randomized. Difficult to account for and interpret variation
Cross-sectional Studies: Compare different age groups at one point in time The groups may differ on other variables, age is not manipulated	Provides a snapshot Focus on drawing conclusions/inferences from existing differences between groups Can use large number of subjects because its not geologically bound Relatively inexpensive and takes little type to conduct	Studies cannot be utilized to establish cause and effect No follow up findings Unequally distributed confounders
Panel Studies: Sample a cross-section at regular interval times	Simple and inexpensive Allows more flexibility with population surveyed	Cross-sectional cons, PLUS: changes in distributions in population over time not accounted for
Retrospective Studies: Look back in time by obtaining past records or archives	Can provide insight even when it's "too late" Increased efficiency and reduced cost	Instrument deficiencies-reliability & bias. Obtaining representative samples of cases and controls

Steps to Keep in Mind:

- * Sampling:
 - * Pure: where every individual should be measured on every single occasion
 - * Mixed: where not all individuals are designed to be measured on all occasions
- * Measurement: Well-defined method of collection
 - * Nominal, Ordinal, Interval, and Ratio
- * Statistical Models: How well it works- analysis stage
- * Time Scales: Historical, Age, Events, Patterns
- * Developing Standards and Norms: Reference population
- * Tracing and Gaining Participation: Locating participants
- * Piloting and Quality Control: Questionnaires and Procedures
- * Coding and Documentation: Atypical or suspicious values
- * Confidentiality and Informed Consent: Anonymity and Cross-checking

Modeling Study Data

Multilevel Growth Modeling: Useful analytic method for longitudinal designs because it effectively models trends of a continuous variable over time

Process-Use Design

Anyone performing a longitudinal evaluation should be interested in process use. This **examines how program staff and organizations change as a result of participating in an evaluation**, independent of the evaluation findings.

Measures:

- 1) Whether an evaluation contributed to new **knowledge**
- 2) Changes in feelings and **attitudes** about evaluation
- 3) Emergent **behaviors** regarding institutionalizing evaluation

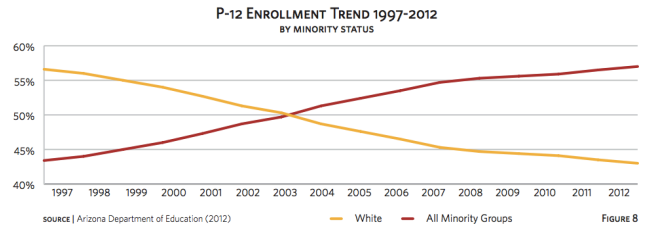
Shoestring Evaluation

Sometimes you don't have the luxury of:

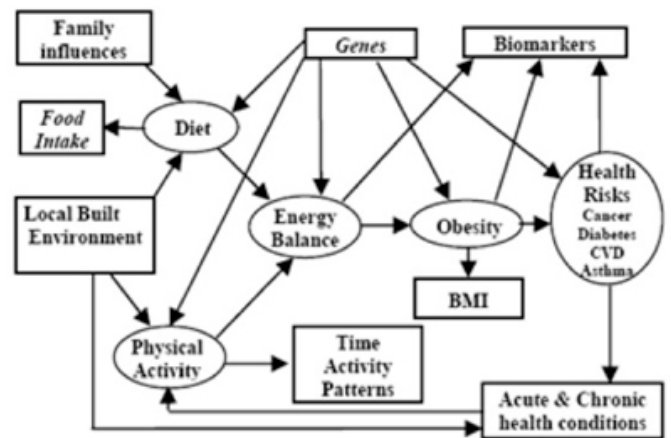
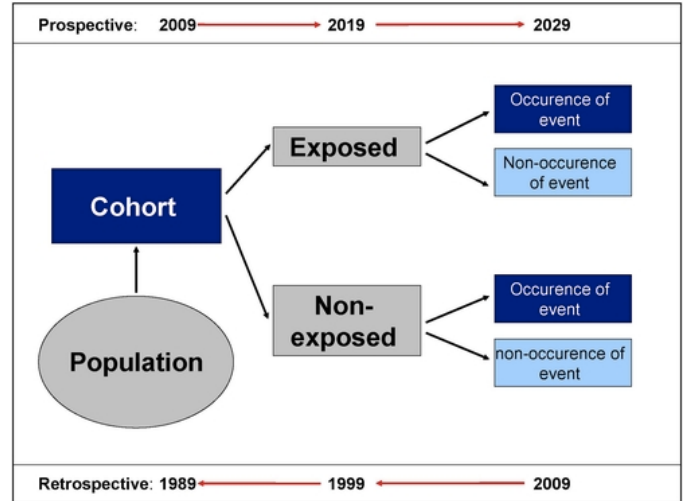
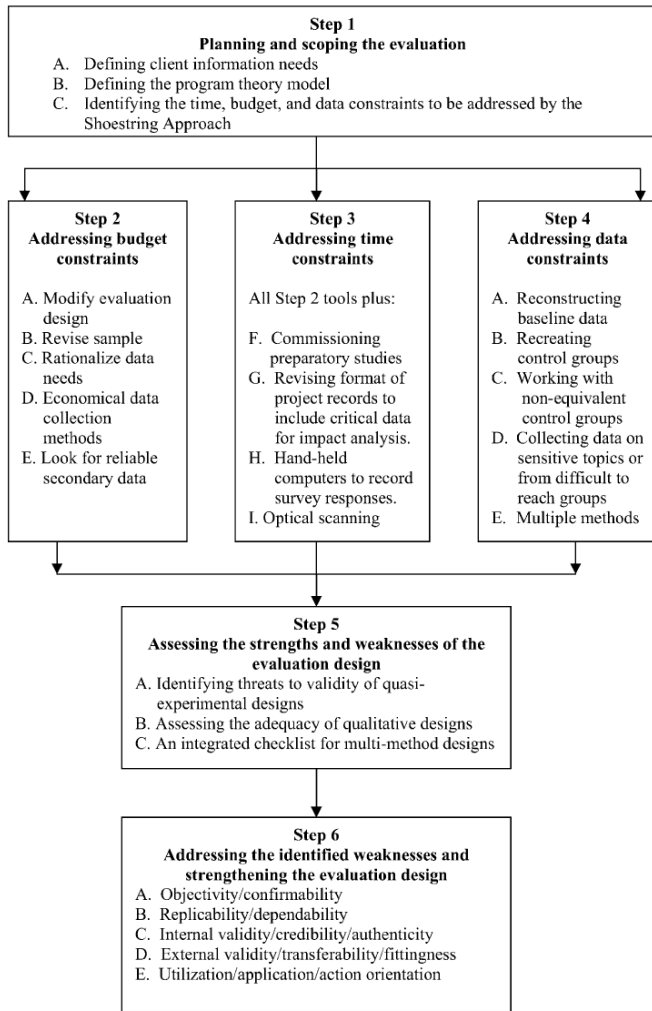
Time	Evaluator called in late in the game Longitudinal, or for end-of-project evaluation
Budget	Not enough \$ to conduct optimal data collection instruments Not enough \$ to reconstruct baseline data or control groups
Data	No baseline data Systemic reporting biases Poor record-keeping

But you can address these problems!

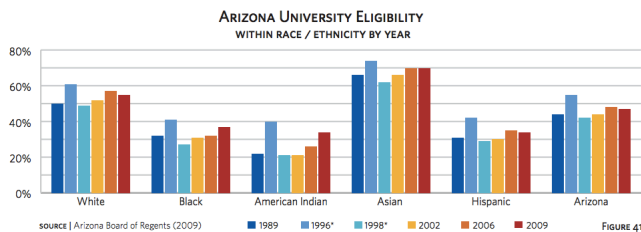
- Modify evaluation design, use creative ways to find or recreate data, use multiple methods, negotiate with key players...
- If you have no choice, admit your threats to validity and stand by your results



Shoestring Evaluation Approach Overview



Examples & Models:



References

- Bamberger, M., Rugh, J., Church, M., & Fort, L. (2004). Shoestring evaluation: Designing impact evaluations under budget, time and data constraints. *American Journal of Evaluation*, 25(1), 5-37.
- Gee, K. A. (2014). Multilevel Growth Modeling An Introductory Approach to Analyzing Longitudinal Data for Evaluators. *American Journal of Evaluation*, 1098214014523823.
- Goldstein, H., & Sc, B. (1979). *The design and analysis of longitudinal studies: Their role in the measurement of change* (p. 199). London: Academic Press.
- Shaw, J., & Campbell, R. (2013). The "Process" of Process Use Methods for Longitudinal Assessment in a Multisite Evaluation. *American Journal of Evaluation*, 1098214013506780.
- <http://libguides.usc.edu/content.php?pid=83009&sid=818072>