Overview: Ex Post Facto (aka “causal-comparative”) Designs

Y520
Strategies for Educational Inquiry

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Causal Comparative Research

- We now shift from describing two or more variables in one group (correlational), to

- Comparison (two or more groups).
Causal Comparative Research

- Involves comparison of two or more groups on a single endogenous variables.
- The characteristic that differentiates these groups is the exogenous variable.
- Causal comparative studies are also called *ex post facto* because the investigator has no control over the exogenous variable. Whatever happened occurred before the researcher arrived.
- We can never know with certainty that the two groups were exactly equal before the difference occurred.

Causal Comparative: Data Collection

- You select two groups that differ on the (exogenous) variable of interest.
- Next, compare the two groups by looking at an endogenous variable that you think might be influenced by the exogenous variable.
- Define clearly and operationally the exogenous variable.
- Be sure the groups are similar on all other important variables.
Causal Comparative: Equating groups

- Use subject matching
- Use change scores; i.e., each subject as own control
- Compare homogeneous groups
- Use analysis of covariance

Causal Comparative: Data Analysis

- Because we usually are dealing with samples, we use inferential statistical testing techniques:
  - T-test (two groups)
  - Analysis of variance
  - Chi-square for frequency data
Causal Comparative: Conclusions

- Researchers often infer cause and effect relationships based on such studies.
- Conditions necessary, but not necessarily sufficient, to infer a causal relationship:
  - A statistical relationship exists that is unlikely attributable to chance variation
  - You have reason to believe the supposed exogenous variable preceded the endogenous.
  - You can, with some degree of certainty, rule out other possible explanations.