Key Dates

- TU Mar 28 Unit 18 “Loss of control drinking in alcoholics” (on course website); Marlatt assignment
- TH Mar 30 Unit 19; Term Paper Step 2
- TU Apr 4 Begin Biological Perspectives, Unit IIIA and 20; Step 2 Assignment
- TH Apr 6 Unit 21
- TU Apr 11 Unit 22; Biological Perspective Assignment

Goal: To become familiar with the methods that researchers use to investigate aspects of causation and methods of treatment

UNIT 18: SCIENTIFIC STUDY OF CAUSATION AND TREATMENT

Learning Outcomes

- By the end of this class, you should be able to:
  - List several reasons why case studies do not constitute strong scientific evidence
  - Describe two reasons why correlations do not provide strong support for causal inferences
  - Identify the key elements that characterize the experimental method
  - Explain why random assignment is so important in experiments
  - Explain what is meant by a confound and then describe how the placebo effect is an example

Scientific Study of Causation and Treatment

- Methods for studying causation
  - Case studies
  - Correlational research and differences-between-groups
  - Prospective designs
  - Experimental designs

Scientific Study of Causation and Treatment

- Case studies: many theories about causation come from therapists and their case studies
- Exciting, and a good way to generate ideas, but limited:
  - Are cases the exception or the rule? Can we generalize?
  - Very subjective data, vulnerable to therapist/observer bias, often little or no objective measurement
  - Client bias? Do they report the truth? Or tell us what we want to hear?
  - Replication difficult, even impossible
  - Post hoc reasoning--clients report what happened before, but just because X comes before Y does not mean that X caused Y

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- Correlational designs: widely used
  - Measure two (or more) variables
  - Calculate the correlation coefficient (0.0 to 1.0) to assess the degree to which the two go together
  - Identify the direction (+ or -) for positive (direct) or negative (inverse) correlation
  - When two variables are significantly correlated, each can be viewed as a risk factor/predictor for the other
  - If one or both variables is categorical (e.g., a diagnosis, or gender), the design is often called “differences-between-groups”

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- Correlation does not mean causation
- Even when the correlation or the difference is significant, we cannot be sure the variables are causally connected:
  - Directionality (the chicken-and-egg problem)
  - Third-variable (when the two are connected only because the two have some common cause)
  - Prospective designs can address the first (not the second), but are hard to conduct compared to cross-sectional

Scientific Study of Causation and Treatment

- Experimental designs are the strongest test of cause-and-effect relationships
  - Select research participants
  - Randomly assign participants to two or more groups
  - Manipulate the independent variable (the suspected cause)
  - Measure the dependent variable (the hypothesized effect)
  - Use statistics to see if there is a significant difference in the DV between groups

Scientific Study of Causation and Treatment

- Experimental control is the key that distinguishes true experiments from differences-between-groups designs (sometimes called “quasi-experimental”)
- We want to be sure that it was the IV that caused the change in DV, so all other possibilities that might influence the results (“confounds”) have to be controlled:
  - Control who gets which IV
  - Randomly assign participants to groups to control for individual differences
  - Double-blind participants and researchers to control for their bias
  - Carry out experimental procedures under constant conditions (e.g., laboratories)

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- Experimental studies of causation in psychopathology are relatively rare:
  - Some experimental manipulations could cause harm
  - Some important causes might not be easily manipulated under controlled conditions
  - Highly controlled conditions might be artificial and not generalizable to the real world
  - Even if A causes B, it might cause more than B, and factors other than A might also cause B

Scientific Study of Causation and Treatment

- Analog designs allow experimental studies to be more easily carried out:
  - Animal studies
  - Studies of non-patients who have problems similar to those of clinical patients
  - Benign manipulations—making independent variables less intense, or for only brief durations, to do little or no harm
- No one design is perfect, so studies of causation rely on multiple methods: the convergence principle

Scientific Study of Causation and Treatment

- Methods for studying treatment
  - Case studies
  - Surveys
  - Correlational research and differences-between-groups
  - Experimental designs
  - Single-subject designs

Scientific Study of Causation and Treatment

- Case studies can be fascinating, can illustrate treatment methods, can be used to pilot new methods
- But same limitations as noted earlier
- And even when treatment seems to work, many alternative explanations:
  - Time and spontaneous remission
  - Other changes external to the treatment
  - Placebo effects
  - Non-specific treatment effects
  - Invalid reports of improvement
  - Sampling effects

Scientific Study of Causation and Treatment

- Surveys and correlational and differences-between-groups studies often use better samples than case studies, and often employ more objective forms of measurement
- But these are open to all the same alternative explanations that occur with case studies, and to directionality and third-variable problems

Scientific Study of Causation and Treatment

- Experimental methods are the strongest
- The double-blind randomized placebo-control design—the "gold standard"
- Growing emphasis on evidence-based practice
- Creating "placebos" for psychological treatments is difficult, as is double-blinding
- Measuring success and showing that it is long-term also difficult
- Efficacy in clinical trials ≠ effectiveness in real world

Scientific Study of Causation and Treatment

- What is the key independent variable?
  - The specific type of treatment reflecting the different perspectives?
  - But what about:
    - "Dosage"—amount and duration and frequency of treatment
    - Treater variables
    - Client variables
    - Cient-treater interaction variables
    - Process variables
    - Non-specific effects of treatment
  - And are there any risks? Is the treatment safe, or worth the risk?