Key Dates

- TH Jan 26 Unit 4
- TU Jan 31 Begin Dimensions-Emotion, Units IIA, 5; MW Ch 3 Paul
- TH Feb 2 Unit 6; MW Ch 3 Agnes, Bess
- TU Feb 7 Unit 7; MW Ch 7 Joseph, Virginia

Goal: To understand the methods that scientists use to study abnormal behavior

UNIT 3: SCIENTIFIC METHODS

Learning Outcomes

- By the end of this class, you should be able to:
  - Distinguish between what it means to say that a diagnosis or measurement is reliable and that it is valid
  - Describe the conclusion one is allowed to draw based on a correlation between two variables
  - Identify the key features that distinguish a true experiment from other forms of research
  - Explain how researchers use descriptive and inferential statistics
  - List and explain the possible flaws and limitations in any research study that one should watch for

Scientific Methods

- “Psychopathology”—the scientific study of psychological pathology (illness, abnormality)
  - Empiricism
  - Replication/reproducible results
  - Research questions/hypotheses and relationships between variables

Scientific Methods

- Operational definitions and measurement
  - Clinical assessment versus research
  - Interviews
  - Observations and rating scales
  - Psychological tests: projective tests, personality and other self-report inventories, neuropsychological and psychophysiological testing
  - Brain imaging and laboratory tests

Scientific Methods

- Reliability and validity of measurement and assessment
  - Reliability = consistency, repeatability
  - Measuring actual things versus measuring samples of behavior
  - Validity = correctness, meaningfulness
  - The problem of constructs
  - Reliability ≠ validity

Scientific Methods

- Sampling and generalization
  - Sample versus population
  - The ideal: random selection
  - The norm: samples of convenience
  - External validity: to what extent may we generalize from our sample to the wider population
  - Identifying the sample: how was it created, and what are its characteristics (demographics)

Scientific Methods

- Designs and controls
  - Designs are like blueprints, and different questions call for different designs
  - Case studies: case studies illustrate, but do not “prove” (though they can disprove)
  - Epidemiological research and surveys
  - Quantitative versus qualitative research

Scientific Methods

- Correlational designs
  - Correlational designs investigate the extent to which any two variables or measures are associated—"correlated"
  - Correlation coefficient, a number between -1.00 and +1.00, tells us *strength* of relationship, with zero meaning "no relationship"
  - Correlation coefficient also tells us *direction* of relationship: negative says more of one/less of other; positive means more/more and less/less
  - BUT--correlation does NOT mean causation

Scientific Methods

- Experimental research
  - Cause = independent variable, which is manipulated by researchers
  - Effect = dependent variable, which Is measured
  - Random assignment to groups
  - Confounds are any other unintended variable in a study that could influence the results (e.g., the placebo effect, experimenter bias)
  - Controlling confounds: e.g., placebo control group, double-blinding
  - Experiments are best way to produce strong support for saying that X causes Y

Scientific Methods

- Statistics
  - Descriptive statistics to summarize data (mean, standard deviation)
  - Inferential statistics to determine whether are results might just have been a fluke within our sample and not applicable to the wider population
  - Statistical significance: $p \leq .05$
  - Measuring effect size

Scientific Methods

- Thinking critically about research
  - Testimonials versus hard evidence
  - Self-reports
  - Biased samples
  - Examples are not proof
  - The ‘post hoc, ergo propter hoc’ fallacy
  - No study is perfect, *p* is never 0, and studies always require replications