Outline

• What is authentic learning?

• How we are trying to apply authentic learning to research methods in psychology.

• Evidence of effectiveness?
Research Methods in Psychology

• Goals:
  a) read, interpret, and understand research
  b) critique research
  c) design valid research that is robust to critiques

• 1 of 3 core courses (Intro Psych, Statistics)

• Need to pass to be admitted into the major

• 2.5 Hours of Lecture per week plus 3 hours of lab. (Here we only focus on lecture).

• Typically class size = 120-140 (last semester 60)
Scientists learn about research methods through carefully reading papers and meeting as a group to discuss the strengths and weaknesses of research.
Authentic learning of Psychology Research Methods

• Concepts (e.g., validity) are learned through thinking about concrete cases
  • homework assignments and tests should involve real articles

• Focused largely on causality and validity
  • Causal structure diagrams

• Knowledge is socially constructed and socially evaluated (e.g., peer review, advisor/student)
  • There should be real dialogue in class among students and between student/instructor
Homework

1) At Home: Read article and answer questions.
2) In Class: Discuss in 2-4 person groups.
3) In Class: Discuss together with random calling.
4) Answer key made available. Homework graded for satisfactory completion.

Test

1) At Home: Read article.
2) Come to class with printed article and notes prepared to answer the same types of questions that were in the homework.
Fall 2013

All lectures
Tests based on fake examples
120 students

Fall 2014

about 60% lecture, 40% HW discussion
Tests based on real articles
2 x 60 students
Based on the introduction to the article (the first page and a half), draw a causal diagram of which variables cause which other variables.
Reaction Time Explains IQ’s Association With Death

**Question:** Are you worried about the reverse causality problem in this study, specifically in regards to the variables IQ and Age at Death?

**Answer:** Given that this study is observational (not experimental), the reverse causality problem is possibly relevant. However, the answer is NO because Age of Death cannot cause IQ.
On Page 456: "First, scores on this [Lay's] procrastination scale were correlated with behavioral procrastination (turning in the paper late), r = .37.…" This finding helps establish:

a) Discriminant validity  
b) Criterion validity**  
c) Content validity  
d) Convergent validity  
e) Test-Retest Reliability  
f) Internal Reliability
Q: Could a selection effect have played a role in this study?
A: Tables 1 and 2 show that the two groups are fairly equal on a number of demographic and pre-intervention factors.

Q: Could an order effect (carryover) have played a role in this study?
A: No, between Ss.

Q: Could attrition have played a role in this study?
A: Attrition definitely occurred in this study, and there was differential attrition (more in the pharmacotherapy condition than cognitive therapy condition)...

Note: the right column of this slide shows questions that appear on the tests. They have been removed when being posted online.
Q: For Experiments 4, which of the variables was observed or manipulated?
- Entering vs. Exiting the Dining Hall (observed)
- Hunger (observed)
- Sex (observed)

Q: Look at this idealized graph from the paper. Are there main effects and or interactions?

Note: the right column of this slide shows questions that appear on the tests. They have been removed when being posted online.
The authors found that the HFA group took more antipsychotic and antidepressant medicines compared to the OO group. On page 254 the authors propose that “It is highly unlikely that taking these medications themselves reduced the chances of the children achieving optimal outcomes. Rather, it may be that … comorbid …” Draw a causal structure to represent the causal relation between medicine prescription and ASD outcome.
Experimental evidence of massive-scale emotional contagion through social networks

Q: Which type of deception was involved in this study?
   A. Deception by omission**
   B. Deception by commission

Q: Are there any / what are the ethical concerns of this study in regards to the Principle of Beneficence? Beneficence involves (1) do not harm and (2) maximize possible benefits and minimize possible harms.

A: They hypothesized that more positive posts might lead to more positive posts, and thus, by reducing positive posts they could in a sense be causing harm. However, they also had another theory, that positive posts could actually harm people by making them feel excluded....

Note: the right column of this slide shows questions that appear on the tests. They have been removed when being posted online.
use of real articles:

- Fosters rich conversations about actual research dilemmas (e.g., causality, validity. Gives me something to talk about
- more interesting
- Refer to specific pages - talk about text, which has both scientific and social aspects (e.g., if author is being disingenuous)
- Encourages students to realize that performance on test is directly tied to how carefully they read and deeply they think about the article.
Organized?

Stimulated my thinking?

Good use of examples?

2013 2014

\[ p < .001, \; d = .78 \]

\[ p < .001, \; d = 1.13 \]

\[ p < .001, \; d = .64 \]
Amount of Work

Amount I learned

Evaluation was fair
Overall Effectiveness

Recommend this course?

Recommend this instructor?

2013 2014

\[ p < .001 \quad d = .89 \]

\[ p = .02 \quad d = .40 \]

\[ p < .001 \quad d = .97 \]
Articles for homework are interesting
Working with other students helps my understanding
Whole-class discussion of HW helps my understanding
More competent in reading research articles
Clear what we will be tested on
Positive

- class discussions were really interesting and … he incorporated everyone into the conversations

- Homework directly reflected the tests; HW and tests were applicable to the real world, made it feel like what I was learning was actually important.

- Before it was almost impossible for me to read a research article and understand it, and now I feel like I have the skills to tackle articles on my own, and be able to recognize not only the big picture, and the smaller details as well

- he takes our suggestions very seriously and made many changes throughout the course to try and improve our learning experience
Negative

• a lot of the time the questions on homework/tests were confusing or hard to understand what was being asked

• when people would make statements in class that were blatantly wrong he wouldn’t say that they were wrong, he would modify what was said to make it right, but that was really confusing…

• a little too focused on a certain example - would slow down class

• sometimes would not finish going over HW

• It is good, just rough around the edges right now. Will get better the more it is taught.

• work load too demanding for amount of credits
Looking Forward - Assessment

• OMETS and other surveys of judgments of learning
  • but self-report
• pre vs. post (homework vs. test)
  • but differential motivation
  • homework is mid, not pre
• my section vs. another section (e.g., taught by grad student)
  • but very different tests
Looking Forward

• Lots of difficulty with causal structures
• Resistance to the idea that the goal is to critique research rather than take it at face value.
• Students have weak background in statistics, which has implications for this class.
• Articles are extremely difficult to find, and questions are extremely difficult to make.
• Difficult to get at the right level - I am overestimating their abilities.
Looking Forward

• Refinement of questions, development of new exercises

• Address challenges with dissemination. Different teachers have different styles
  • fear of not covering a topic
  • prepare for the next class vs. prepare for lifelong learning

• Are some students left behind?
  • don’t want to participate / can’t participate
  • low vocabulary, low critical thinking skills