Chapter 2
Methods in Psychology

OUTLINE OF RESOURCES

I. EMPIRICISM: HOW TO KNOW STUFF

Lecture Suggestion 2.1: Step Right Up . . . Gullibility on the Midway! (p. 2-5)
Lecture Suggestion 2.2: Countering Reactivity (p. 2-6)
Classroom Exercise 2.1: Real-Life Behavioral Science (p. 2-8)
Classroom Exercise 2.2: Theories and Hypotheses (p. 2-9)

II. OBSERVATION: DISCOVERING WHAT PEOPLE DO

Lecture Suggestion 2.3: Power to the People (p. 2-10)
Lecture Suggestion 2.4: Demand Characteristics (p. 2-11)
Classroom Exercise 2.3: It’s Not What You Say, It’s the Way You Say It (p. 2-12)
Classroom Exercise 2.4: Yo Yo Yo: Listen Up (p. 2-14)
Classroom Exercise 2.5: Smile! You’re a Scientist! (p. 2-16)
Classroom Exercise 2.6: Collecting Class Data (p. 2-17)

Multimedia Suggestions
Feature Film: *Das Experiment* (2001, 119 min, rated R) (p. 2-17)
PsychInvestigator: Naturalistic Observations

PsychSim 5 Tutorials:
- What’s Wrong with This Study?
- Descriptive Statistics

Worth Video Series:
- Video Anthology for Introductory Psychology: Experimental Design

*Scientific American Introductory Psychology Videos: Research Methods*
III. EXPLANATION: DISCOVERING WHY PEOPLE DO WHAT THEY DO

Lecture Suggestion 2.5: How to Live Longer (p. 2-19)

Lecture Suggestion 2.6: Wild and Wacky (p. 2-19)

Lecture Suggestion 2.7: Correlation Is NOT Causation (p. 2-20)

Classroom Exercise 2.7: Design an Experiment (p. 2-21)

Classroom Exercise 2.8: “I’ve Got a Golden Ticket . . .” (p. 2-21)

Classroom Exercise 2.9: Ripped from Today’s Headlines: Experimentation on the Newsstand (p. 2-22)

Classroom Exercise 2.10: Black Box Psychology (p. 2-23)

Classroom Exercise 2.11: Elements of Experimental Design—The Coke-Pepsi Challenge (p. 2-25)

Multimedia Suggestions

Feature Film: *The Wave* (1981, 44 min, not rated) (p. 2-26)

Interactive Presentation Slides for Introductory Psychology: 2.1 Statistical Methods

PsychInvestigator: Correlation and Statistics

PsychSim 5 Tutorials:

  What’s Wrong with This Study?

  Correlation

Worth Video Series:

  Video Anthology for Introductory Psychology: Does Self-Confidence Intimidate Others?

  Video Anthology for Introductory Psychology: Schachter’s Affiliation Experiment

  Video Anthology for Introductory Psychology: Experimental Design

*Scientific American Introductory Psychology Videos: Correlation and Causation*

*Scientific American Introductory Psychology Videos: Research Methods*
IV. THE ETHICS OF SCIENCE: FIRST, DO NO HARM

Lecture Suggestion 2.8: Ethics in Perspective (p. 2-27)

Lecture Suggestion 2.9: The Ethical Treatment of Research Participants (p. 2-29)

Lecture Suggestion 2.10: The Cyril Burt Affair (p. 2-30)

Classroom Exercise 2.12: Ethics and Controversy (p. 2-31)

Multimedia Suggestions

Feature Films:

*Eternal Sunshine of the Spotless Mind* (2004, 108 min, rated R) (p. 2-32)

*Wrong Answer* (2005, 7 min, not rated) (p. 2-33)

Worth Video Series:

Worth Video Anthology for Introductory Psychology: Ethics in Human Research – Violating One’s Privacy

Worth Video Anthology for Introductory Psychology: Ethics in Animal Research – The Sad Case of the Booee Chimp

OTHER FILM SOURCES (p. 2-33)

HANDOUTS

HANDOUT 2.1A: General Opinions Survey

HANDOUT 2.1B: General Opinions Survey

Chapter Objectives

After studying this chapter, students should be able to:

1. Contrast *dogmatism* with *empiricism* and identify which is an essential element of the scientific method.

2. Using the terms *theory* and *hypothesis*, describe the process by which the scientific method can be used to learn about the world.

3. Explain how *complexity*, *variability*, and *reactivity* make the study of human behavior difficult, and provide an example of each attribute.

4. Distinguish between the two keys of scientific measurement—*definition* and *detection*—by providing an *operational definition* and *measure* of a property.
5. Describe three properties of a good measure: validity, reliability, and power.

6. Define demand characteristics, and explain how naturalistic observation, anonymity, and the use of unobtrusive measures, may be used to diminish the problems they present.

7. Describe what observer bias is in psychological research and how double-blind observation minimizes this problem as well as reduces demand characteristics.

8. Interpret a frequency distribution and describe the basic characteristics of a normal distribution.

9. Define three measures of central tendency and two measures of variability.

10. Explain what is meant by the statement “Two variables are correlated,” and describe how a correlation coefficient measures both the direction and strength of this relationship.

11. Explain why natural correlations cannot be used to infer causality due to the possibility of third-variable correlations; differentiate between the matched samples and matched pairs techniques to reduce the third-variable problem.

12. Describe the following critical features of an experiment: random assignment of participants to the experimental and control groups, manipulation of an independent variable, and measurement of a dependent variable.

13. Explain what is meant when an experimental result is described as statistically significant.

14. Distinguish between the internal and external validity of an experiment.

15. Distinguish between a population and a sample, explain the process of random sampling to achieve representativeness, and provide three reasons why random sampling is not always needed in psychological research.

16. Explain why it is important that we think critically about the results of psychological research and give examples of the ways in which we can fail to take this skeptical stance towards the data we collect.

17. Describe the three basic principles and specific rules within the psychology of ethical research using human and animal participants.

I. Empiricism: How to Know Stuff

(Chapter Objectives 1–3)

Empiricism involves using observation to gain knowledge about the world. Because causal observation is prone to error, sciences have developed methods for observation.
These methods are unusually sophisticated in psychology because people are unusually complex, variable, and reactive. In trying to understand phenomena like human behavior, psychologists construct **theories**, which are hypothetical explanations for why phenomena occur. From these theories, psychologists develop **hypotheses**, which are testable predictions that allow for the evaluation of the theory.

**Lecture Suggestion 2.1**

Step Right Up . . . Gullibility on the Midway!

Most scientists agree that the best way to know about things is to measure those things directly. The say-so of authorities can often be correct, but it can also lead to unwarranted excommunications, misbegotten death penalties, or errant entries into undeclared wars. As the text points out, empiricism is usually better than dogmatism.

You can illustrate the dangers of relying on the opinion of authorities by capitalizing on that old standby, the Barnum effect. This effect occurs when people believe that general and ambiguous statements are reflective of their unique personalities. It is named in honor of the showman who noted “there’s a sucker born every minute.” The Barnum effect has been used successfully to teach about personality measurement, ethics in research, and other areas, but in the present case you can adapt it to teach students about the benefits of critical thinking and the importance of methodology in science.

Tell your students early in the semester that you have been specifically trained in graphology, or the “science” of analyzing handwriting. Play up the fact that you are credentialed by the IGI (International Graphology Institute . . . say it’s based in Switzerland . . . sounds good . . . ) and that you have been using graphology to determine personality for years. (You can feel free to include whatever additional bogus qualifications you want, as time and your conscience dictate.) To demonstrate how graphology works, ask your students to provide a sample of their handwriting by writing their name and the following sentences on a blank piece of paper: “The quick brown fox jumped over the lazy dog. In vino veritas! He or she who owns land owns up to the sky. What, me worry?” (Again, feel free to choose whatever short passage or collection of sentences you’d like!) Collect the sheets and explain that, in a few class meetings, you’ll return a personality profile based on your analysis of their writing.

A few days later (or, whenever you start talking about research methods), return an “analysis” to each student. On a sheet of paper, handwrite the student’s name (the personalized touch is always good) and then type the following bogus personality description (borrowed from Forer, 1949):

> You have a strong need for other people to like and to admire you. You have a tendency to be critical of yourself. You pride yourself on being an independent thinker and do not accept other opinions without satisfactory proof. You have found it unwise to be too frank in revealing yourself to others. At times you are extraverted, mild-mannered, and social; at other times you are introverted, wary, and reserved. Some of your aspirations tend to be pretty unrealistic.
It seems you are nursing a grudge against someone; you really ought to let that go. You worry about things more than you let on, even to your best friends. You are adaptable to social situations and your interests are wide-ranging.

Note that this material is intentionally not reproduced as a handout at the end of this chapter. If it were, it’d be clear to students that it was simply photocopied from a single source. You should instead do whatever you can to make the information appear as though it were developed for each student individually; hence, writing the student’s name at the top of the page, using different fonts for different students, flipping through the stacks of papers as you distribute them (to appear as though you’re looking for a unique description for a unique student), etc.

After students have read their “personality profile,” you can do a number of things. If you’d like something more quantitative, prepare a simple rating scale asking for the extent of agreement with the statements the students read. If you’d prefer something less formal, open the floor to discussion: How accurate did students think the profile was for them? Did they find it captured some deep aspect of their personality? Are they impressed with your graphological abilities? Did they realize graphology was such a mainstay of psychological methods? Decide the point at which you want to reveal the truth of the matter, then progress to a discussion of research methods. Point out not only the dangers of being too accepting of received wisdom, but also the ways in which having a sound methodology can reveal flaws in uncritical thinking. You can decide how much you want to bring in issues of reliability, validity, sampling, experimentation, demand characteristics, test development, and other aspects of research methodology.

Sources:


**Lecture Suggestion 2.2**

Countering Reactivity

The text mentions the special difficulties associated with studying human beings. First, human behavior is unusually complex, making the study of behavior (and especially its origins in the human brain) quite a challenge. Second, people are extraordinarily variable, making it difficult to formulate laws of behavior or ironclad principles for what someone will do in a given situation. Third, people are reactive, making the unobtrusive study of their behavior that much more critical for sound methodology.

Share with your students some examples of unobtrusive measurement, and note how they provide a glimpse of human behavior that might not be obtained otherwise. An excellent starting point for examples is Gene Webb’s wonderful book on the subject; chances are good that you, a colleague, or your university’s library might have a copy.
You can also find examples on the Internet or in methodology books for sociology or public opinion polling. Here are some examples to get you started:

- Hidden cameras or microphones are an old standby. If research participants are uninformed as to the presence of recording devices, their behavior is likely to unfold as it customarily would.

- The old “I Spy” technique is also tried and true. Making observations from behind a newspaper, perched in some bushes, or while pretending to be engaged in conversation can be effective, as long as no one violates trespassing rules or appears to be a stalker!

- Iraneus Eibl-Eibesfeldt, the human ethologist, studied romantic behavior in couples by pretending to be a tourist. He rigged an old-fashioned box camera with a series of mirrors, so that as he appeared to be taking a photograph of an attraction directly in front of him, he was actually studying the attraction of a couple 90 degrees to his left. He captured the naturally occurring behavior without the participants’ awareness.

- Museums can measure the popularity of various exhibits by installing new floor tiles in front of each exhibit. After some amount of time—a month, let’s say—the tiles can be inspected and compared for wear and tear. Presumably, those tiles in worse shape ought to indicate exhibits of greater popularity, as more people scuff and scrape their way to see them.

- Rummaging through garbage is the reason most people get a PhD in the first place. Wait! That’s not right! But you could include a discussion of the whole universe of measures that relies on inspecting and coding refuse, such as counting the number of beer bottles in the recycling bin as a measure of sociability, or investigating the amount and type of newspapers and magazines that are thrown out in a given set of households. Note that the paparazzi have co-opted this technique to great effect.

- There are numerous unobtrusive measures that don’t really involve humans at all, such as examining the wear and tear of library books as an index of their popularity (or, if available, the check-out history of those books) or conducting content analyses of written passages or print advertisements.

- Participant observation is often used as a means of unobtrusive measurement. You could relate the well-known examples of Rosenhan (1973) or Festinger, Riecken, and Schachter (1956).

- Public records can be a source of unobtrusive measurement. Ask your students what information might be gained from dating advertisements in the personal ads, obituaries, wedding announcements, birth records, crime statistics, data on energy usage, and/or help-wanted ads.

In these and the many other examples you can no doubt generate, be sure to include a discussion of the pros and cons of each technique, as well as ethical considerations that arise from using many of these techniques. In discussing the ethical issues surrounding
these different techniques, you can note that our standards for what is considered ethical have changed over time, and some classic research studies from psychology’s past would be difficult or impossible to conduct now. Overall, your introductory students should come to appreciate the wide range of methods available to psychologists, and the ingenuity we often apply to solving what seem to be intractable problems of measurement.

Sources:


*APA ethical principles of psychologists and code of conduct—Standard 8* provides specific guidelines for research and publication, http://www.apa.org/ethics/code/index.aspx

**Classroom Exercise 2.1**

Real-Life Behavioral Science

Introductory psychology students are more likely to serve as research participants rather than as experimenters, and that’s probably as it should be. Nonetheless, there are easy ways to introduce your students to the research process and give them a little experience in formulating hypotheses and collecting data.

A readily available “laboratory” can be found on almost every college campus: the university dining hall. Other public spaces would also work—the student union, for example, or the dormitories—but the dining hall has the advantage of drawing lots of students on a regular basis. Here are some ideas for conducting psychological science at this site:

- **Observational research.** There are myriad ways that naturalistic observations can be made in the dining area. After explaining the basics of this research technique to your students, turn them loose to develop their own hypotheses. Many will focus on questions involving seating choices (do more women or men congregate in smaller or larger groups?), food choices (who tends to go back for seconds? who’s in the dessert line?), sociability (who sits alone? who sits in groups? how do students migrate from table to table, interacting with different sets of friends?), or apparel (who’s wearing pajamas at noon? how many people are wearing clothing with the university logo on it?). Other students will no doubt be more creative. Regardless of the questions they formulate, stress the importance of developing sound operational definitions and collecting unobtrusive measurements.
■ Correlational research. Ask the students to form small groups to work on a project that is correlational in nature. Groups should feel free to jointly develop a hypothesis (thus illustrating the value and importance of collaboration in science), but it should be one that can reveal a relationship between two variables. Some examples include examining the association between ounces of salad purchased and some personal characteristic (e.g., sex, hair length, payment type), number of napkins taken and size of food portions selected, or the number of people in line and the time of day. Students should collect their measurements in the dining hall, then analyze the results in a subsequent class meeting.

■ Experimental research. Simple experiments that involve minimal intervention can also be planned in a dining environment. For example, students might measure the speed with which someone moves along the buffet line when another student is present. One person could act as a confederate and sidle up to an unsuspecting student already in line, varying the interpersonal distance between the two and then measuring the speed of food selection. In another example, students might place dirty trays on an unoccupied table and measure the reactions of groups wanting to sit there, compared with clean tables. With a nod to Stanley Milgram, cutting into waiting lines is always a popular manipulation, as well.

You can decide the extent, elaborateness, and appropriateness of these kinds of demonstrations for your particular students. At a minimum, consider some simple and fun ways to get your students involved in the conduct of research.

Source:

Classroom Exercise 2.2
Theories and Hypotheses

Students often have a hard time distinguishing between theories and hypotheses; to their minds both seem hypothetical and testable. You can help them make the distinction between theories—explanations of behavioral phenomena—and hypotheses—specific, testable, predictions derived from theories—by asking students to work in groups and construct six theories and then propose a hypothesis that could be tested for each of the theories. You can let students choose their own topics to explore or you can suggest topics for which they need to develop theories. Possibilities include cell phones and driving, online friendships versus real-world friendships, violence in children’s cartoons, books in the home and academic achievement. Bring the groups back together and have them evaluate others’ work: Are the theories and hypotheses falsifiable? Do the hypotheses follow from the theories?
II. OBSERVATION: DISCOVERING WHAT PEOPLE DO

(Chapter Objectives 4–9)

Measurement is a scientific means of observation that involves defining an abstract property in terms of some concrete condition, called an operational definition, and then constructing a device, or a measure, that can detect the definitions specified. A good operational definition shares meaning with the property, or has construct validity, and is related to other operational definitions, or has predictive validity. Measures must be valid, reliable, and powerful. Reliability refers to the consistency of a measure, and power refers to the measure’s ability to detect differences that do exist and not to detect differences that don’t exist.

When people are being observed, they may behave as they think they should. Demand characteristics are features of a setting that suggest to people that they should behave in a particular way. Researchers use cover stories and filler items to reduce or eliminate demand characteristics. They also use double-blind procedures so that the experimenter’s expectations do not influence the participant’s behavior.

After collecting data, psychologists need some way to summarize the information collected. One way is to create a graphic representation of the data, known as a frequency distribution. Frequency distributions come in a variety of shapes, but one particular distribution deserves special mention. The normal distribution is a symmetrical, bell-shaped curve that is of particular value to psychologists (and statisticians) because we know the exact area underneath different portions of the curve.

Another way to summarize data is through numbers known as descriptive statistics. The two most useful descriptive statistics are measures of central tendency, which tell us the value that best summarizes the entire data set, and measures of variability, which provide information about how the data are distributed around that measure of central tendency. The measure of central tendency that is used most often is the mean, which is the average value of all of the measurements. However, there are times when we can’t use the mean because the data set contains a few extreme scores that result in the mean presenting an inaccurate measure of central tendency. In that situation, the middle score of the distribution, the median, is a more appropriate measure of central tendency. Then there are situations when our data cannot be averaged because the data are categorical, for example, measures of political affiliation or gender, and numbers don’t convey any useful information about the variable’s properties. In this situation, the mode, the most common score, is the appropriate measure of central tendency. Common measures of variability are the range, the difference between the highest and lowest scores in a distribution, and the standard deviation, which is the average difference between each score in a distribution and the mean of that distribution.

Lecture Suggestion 2.3

Power to the People

Of the core principles of statistical inference testing, most people grasp the concepts of
statistical significance, Type I and II errors, reliability, and validity. Unfortunately, power is sort of the lone ranger of that group. Students generally get the idea, but a little more clarification is always welcome.

Jeanetta Williams, at St. Edward’s University, suggests a simple but effective way to illustrate the concept of statistical power for your students. Ask them to imagine the following scenario:

You are out with friends at a dance club. Suddenly, one of your friends stops the group from dancing and exclaims, “Freeze! I’ve lost my contact lens on the floor. Please help me find it!” It’s pretty dark, except for the strobe lights. Another friend says, “Wait. I’ve got a flashlight.” In fact, she has a pen-sized flashlight attached to her keychain. She shines it back and forth across the floor hoping to reveal the elusive lens.

At this point ask your students, “How difficult do you think it will be to find the lens?” They should correctly answer, “It’s lost forever, unless you get extremely lucky” or words to that effect. Lucky is good, but we should be able to do better; we want to actually find the lens. Back to the scenario . . .

Another friend says, “Wait. I’ve got a flashlight.” This safety-maven draws out a Maglite flashlight from her purse, which creates a wide spotlight on the floor. Do not look directly into the light!

Now ask your students, “How difficult do you think it will be to find the lens?” The typical response, quite correctly, is, “Not at all difficult. You should see it right away.”

In this scenario, the contact lens represents a statistically significant relationship between variables. The flashlight represents the power built into a study, which affects how easy or difficult it will be to detect the variables’ relationship. Ask your students if the contact lens itself changed size or shape; of course it didn’t! It was the simple fact that having more power (in the form of a bigger, megawatt flashlight) allowed us to find it. Similarly, when conducting research with human participants, each a little bundle of variability, it can be difficult to detect significant relationships between variables. Not unlike a crowded, poorly lit dance club, power helps us to cut through the clutter and “see” significant relationships.

Finally, ask your students to imagine that instead of a contact lens, the friend’s cell phone fell to the floor. Is it easier to find the cell phone than the contact lens—using either flashlight? Definitely. A larger object is easier to spot, even with limited power, just as larger effects or correlations are easier to detect. With that in mind, you could progress to a discussion of significance levels, effect size, or the law of large numbers.

Lecture Suggestion 2.4

Demand Characteristics

While the textbook defines demand characteristics as aspects of an observational setting that cause people to behave as they think they should, we can also talk about demand
characteristics as unintentional cues that participants pick up from experimenters or the research situation that lead the participants to expect certain experiences and to behave in certain ways. The psychologist Martin Orne has done a number of studies demonstrating the phenomenon of demand characteristics on participants’ behavior. One classic study was his research on the deprivation of meaning (Orne & Scheibe, 1964). Earlier research on the effects of sensory deprivation had found that when participants were placed in prolonged isolation, floating in tanks of warm water with no light or sound, they experienced impaired cognitive function and in some cases hallucinations. Orne was convinced that these observed behavioral changes were the result of how the experimenters had presented their studies to their participants.

On his own, Orne conducted a study of meaning deprivation to see what role demand characteristics play. In Orne’s study the “isolation chamber” was an ordinary room with two chairs, a window, and a mirror. Participants were left in the room for four hours with a sandwich and a glass of water. There was also a microphone and an experimenter call button in the room. In the experimental condition, participants were greeted by an experimenter in a white lab coat who conducted an extensive medical history and had participants sign a medical release form. Prominently displayed in the room where the interview took place was a medical “crash cart” with drugs and medical instruments labeled for emergencies. After the interview, participants were escorted to the isolation chamber, shown the microphone they could use to contact the experimenter, and told that if the experience of meaning deprivation became too intense they could end the study by pushing the panic button. Control participants were not asked for a medical history or asked to sign a release form, and they were not given any cues to suggest that they were going to have an unpleasant experience.

Orne found that participants in the experimental condition reacted to the cues the experimenter had presented. One of the participants, in fact, pressed the panic button, several others reported hallucinations, others complained of anxiety and difficulty concentrating, and almost all showed impaired performance on tests of perception and intelligence. None of the control participants reported any difficulties with the procedure or showed any impairment in functioning.


Classroom Exercise 2.3

It’s Not What You Say, It’s the Way You Say it

Discussions of reliability and validity tend to focus on statistical aspects of developing survey measures. These are admittedly important, but what’s sometimes overlooked is the simple wording of survey items themselves. Laura Madson, of New Mexico State University, suggests an exercise to illustrate the impact of item wording on survey results.
Ask your students to collect data from a small sample of friends using one of the two versions of the scale reproduced in Handouts 2.1A and 2.1B.

Be clear that all data should be collected anonymously, and also be clear that, because these data are for illustrative purposes only, it’s fine to have friends and loved ones complete the scale (i.e., it doesn’t need to be a formal, large-scale investigation using naïve participants . . . it can be, but it doesn’t need to be).

Summary:

If your results are like those reported by Madson, you should find notable differences in item responses, attributable to the wording of each. Using the two versions of the scale, the mean responses were as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Version A Mean</th>
<th>Version B Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Taxes</td>
<td>2.88</td>
<td>2.18</td>
</tr>
<tr>
<td>2. Task of government</td>
<td>3.19</td>
<td>2.50</td>
</tr>
<tr>
<td>3. Car maintenance</td>
<td>2.90</td>
<td>3.27</td>
</tr>
<tr>
<td>4. Lying</td>
<td>2.65</td>
<td>2.37</td>
</tr>
<tr>
<td>5. Sex and monogamy</td>
<td>1.98</td>
<td>2.57</td>
</tr>
<tr>
<td>6. Sex and relationships</td>
<td>3.03</td>
<td>4.62</td>
</tr>
<tr>
<td>7. Safe sex</td>
<td>2.92</td>
<td>5.22</td>
</tr>
</tbody>
</table>

The last item on the survey, regarding how often respondents report exercising, should also show different frequencies based on the different response categories. For example, “occasionally,” when split into “less than once a week,” “once a week,” or “2 times a week,” should show a more nuanced pattern of responses.

Discussion:

Discuss with your students the importance of careful item wording, and ask them to provide other examples where a pollster, a market researcher, or a telephone solicitor might have posed a question in such a way as to elicit a particular response. The benefits of unbiased data collection should be clear to them, and participating in this exercise should help bring that point home.

Source:

Classroom Exercise 2.4

Yo Yo Yo: Listen Up

Depending on how much detail you devote to statistics in the methodology section of your course, you might consider sharing with your students some fun ways of keeping track of basic statistical concepts.

There are, inexplicably, several videos circulating on the Internet that incorporate statistics into musical productions. Most of these go by some variation of “stat rap,” “statz rap,” or “statistics rap,” but even a cursory search of YouTube or GoogleVideo should yield a bounty of possibilities. The URLs for several of the more popular ones are given below.

Carmen VanVoorhis, of the University of Wisconsin–La Crosse, also suggests using jingles as a way of understanding statistics. A few of these, sung to the melody of well-known songs, are reproduced here.

Whatever avenue you take—cool and classic, or fierce and funky—have a laugh with your students while helping them learn.

I’m a Standard Deviation

(to the tune of “I’m a Yankee Doodle Dandy”)

I’m a standard deviation

A standard deviation am I

I estimate the average distance from the mean

Across a group of scores.

I’m a standard deviation

A standard deviation am I

Subtract the mean from each score

Square and add them up

Divide by \( n \), take the square root

And that’s a standard deviation
Plot, Plot, Plot Your Curve

(to the tune of “Row, Row, Row Your Boat”)

Plot, plot, plot your curve
Plot your normal curve
The mean is equal to the median and mode
Plot your normal curve
Sixty-eight percent of scores
Fall within just one
Standard deviation mark
Above and below the mean
Ninety-six percent of scores
Fall within just two
Standard deviations
Above and below the mean
Ninety-nine percent of scores
Fall right within three
Standard deviations
Above and below the mean

Sources:


http://www.youtube.com/watch?v=RIbOztw_W-U
http://www.youtube.com/watch?v=IcuAh7Nafrc&feature=related
http://www.youtube.com/watch?v=tAh2GxI23xY
http://www.youtube.com/watch?v=siXImB1iev8
http://youtube.com/watch?v=JS9GmU5hr5w
Classroom Exercise 2.5

Smile! You’re a Scientist!

Angela Lipsitz, of Northern Kentucky University, suggests a simple and engaging way to introduce students to the concepts of operationalization, hypothesis testing, and data collection.

- Ask your students to bring to class a yearbook from a coeducational high school or college. This is usually a simple request; most students have their own yearbooks readily available or can borrow one from a roommate or friend.

- Tell them that they will be testing a hypothesis regarding gender differences in smiling. Explain that the null hypothesis would be that women and men do not differ in their rates of smiling, whereas a two-tailed alternative hypothesis would be that there is some difference. A more focused one-tailed test would specifically predict that women smile more than men (which, as you probably know, has been documented in several studies over the years). You can decide how much detail you’d like to devote to discussing null and alternative hypotheses, but students should grasp the basics of posing a research question of this type.

- Next, discuss with your students which operational definition of “smiling” should be adopted. Teeth showing? Smirk? Visible uplift of zygomaticus major? Anything more pleasant-looking than a neutral expression? Should there be agreement across multiple raters? Students should come to appreciate the necessity and (sometimes) complexity of formulating appropriate operational definitions of variables.

- Ask your students to work in pairs to code the photos in the yearbooks they’ve provided. Working in pairs allows the chance for inter-rater agreement, and also makes the exercise more enjoyable.

- Students should code two classes (e.g., juniors and seniors) from each of two yearbooks if possible, although this will be dictated by time constraints. For example, if the class size in the yearbook is large, ask students to code only one group (e.g., just sophomores), or to code every fourth face, or to code just one yearbook. You can decide how much data to generate to fit your needs.

- Students should record the number (and percent) of women and men smiling, the total class size, their own sex, the year the yearbook was published, the class rank analyzed, and any other data you’d like to include. Again, let your desire for elaboration guide your choices: a simple count of women versus men smiling or not might suffice, or you might like the ability to compute correlations with rater sex, year of publication, class standing, and so on.

Lipsitz reports that about 90% of women smile in yearbook photos, compared to about 67% of men. Analyze the data with your students and see what results. Be sure to tie the discussion in to the methodological themes they are learning about.
Classroom Exercise 2.6

Collecting Class Data

You can help students better grasp statistical concepts by collecting data from them and then summarizing the results for presentation in class. Not only is this easy to do, but since their “own” data are being summarized, students are more interested. This data collection can easily be done with a variety of free survey tools, such as SurveyMonkey, or perhaps even within your course management system. One of the simplest tools to use is Qualtrics (http://www.qualtrics.com/). Not only is survey creation incredibly straightforward and intuitive, but once you have collected the data, you can easily export to SPSS or Excel or create tables and figures for exporting to PowerPoint.

You should ask questions that aren’t too personal and yet allow you to demonstrate the appropriateness of different measures of central tendency. Categorical data such as gender or handedness highlight the utility of the mode, and asking students to identify their favorite number clearly demonstrates the advantage of the median over the mode, as you can pretty much count on one or two students identifying some huge number as their favorite, e.g., $2.86 \times 10^{20}$, which results in most everyone else’s choices falling below the mean. For data that is most appropriate to demonstrate the use of the mean, you could ask questions ranging from height to family size. A particularly good method is to ask students how much time they spend watching TV each week. Not only are these data best summarized by the mean, but you can reliably count on differences between male and female students should you want to discuss inferential statistics. Depending on the amount of time you want to devote to this activity and how large the class is, you can treat the class as a population and draw a random sample from the larger group of responses and see how well the sample matches the population. You could also explore/demonstrate why we don’t need to sample every subject in the population to get a fairly accurate picture of the population comparing the means and standard deviations of samples of 20, 40, and 80 students with the population means and standard deviations.

Multimedia Suggestions

Feature Film: Das Experiment (2001, 119 min, rated R) This German film is based on the Stanford prison study conducted by Craig Haney, the late W. Curtis Banks, and Philip Zimbardo in the early 1970s. A professor enlists the aid of volunteers to spend some time in a makeshift prison set up in a psychology lab. Lots of things go wrong. You probably know how it ends.

See the Preface for product information on the following items:

PsychInvestigator Naturalistic Observation
PsychSim 5 Tutorials

What’s Wrong with This Study?

Descriptive Statistics

Worth Video Series

Video Anthology for Introductory Psychology: Experimental Design

Scientific American Introductory Psychology Videos: Research Methods

III. EXPLANATION: DISCOVERING WHY PEOPLE DO WHAT THEY DO

(Chapter Objectives 10–16)

Psychologists sometimes use the case method to study single, exceptional individuals, but more often they use samples of people drawn from a population. From samples, psychologists draw conclusions about people on average rather than about individuals.

To determine whether two variables are causally related, you must first determine whether they are related at all. This can be done by measuring each variable many times and then comparing the patterns of variation within each series of measurements. If the patterns covary, then the variables are correlated. Correlation refers to a relationship signified by synchronization in the patterns of variation of two variables.

Even when you observe a strong correlation between two variables, you can’t conclude that changes in one variable cause changes in the second variable. As psychologists like to say, “Correlation is not causation.” This is because it is possible that some third variable causes the changes in the two variables you are examining, a problem known as third-variable correlation. Two variables can be correlated for any one of three reasons: X causes Y, Y causes X, or Z causes X and Y. An experiment is the only way we can determine for which of these three reasons a pair of variables is correlated. It involves the manipulation of an independent variable, resulting in an experimental group and a control group, and the measurement of a dependent variable.

An experiment allows researchers to make causal statements because in a well-designed experiment, the only difference between the experimental and control groups is the manipulation of the independent variable. This is, in part, achieved through the process of random assignment: Every person has an equal chance of being assigned to the experimental or control groups.

Other issues of concern in designing experiments involve internal validity, which asks how well the experiment allows for the determination of causal relationships, and external validity, which asks how well our operationally defined variables reflect the real world, who we are studying—the population—and what sort of sample we have drawn from the population.
Lecture Suggestion 2.5

How to Live Longer

Here’s a simple way to live a longer life: win a Nobel Prize.

Andrew Oswald and Matthew Rablen, at the University of Warwick, analyzed the lives of 524 nominees for Nobel prizes in physics and chemistry between 1901 and 1950. They discovered that the 135 winners lived about two years longer, on average, than did the runners-up. The average lifespan for all nominees (winners included) was 76 years. Worldwide, winners lived about 1.4 years longer than nonwinners, and winners from the same country as nonwinners lived about another eight months longer than that. The authors indicate that it was not the boost in income that accounted for the effect; it’s nice to win a million dollars or so, but the money alone didn’t predict longevity across the sample. Rather, it was the social status, notoriety, and just plain bragging rights that went along with the Nobel that seemed to be driving their longer lives. Other evidence (among the less-awarded of us) indicates that people with higher social status tend to live longer than those with lower social status, although the exact mechanisms remain a mystery.

You might share these findings with your students, and use them as a vehicle to discuss case studies, correlation, and experimentation. Clearly there’s a trend linking Nobel-winning and longevity, but that’s a far cry from claiming that winning a Nobel Prize is what causes longevity. Demonstrating similar effects in related domains would help disentangle the causal mechanisms at work and pave the way for experimental studies of this phenomenon. In the meantime . . . get back to work. You might get a call from Stockholm one day and have a few extra years to enjoy the benefits.

Sources:


Lecture Suggestion 2.6

Wild and Wacky

A discussion of correlation and experimentation offers a chance to spice things up with some memorable anecdotes. Many students assume that somehow statistical procedures are “immortal”; that is, the correlation coefficient that describes a relationship between two variables must simply “be,” just as the analysis of variance that helps plumb the components of variability in an experiment must have been handed down from on high. It seems odd that someone had to invent this stuff; numbers and math have an eternal quality to them. But the manipulation of numbers—like computing a $t$-test—is a human activity. Here are the stories of some of the manipulators, and their quirks.
Sir Ronald Fisher. Fisher developed concepts such as hypothesis testing, analysis of variance, and significance levels. By many accounts he was cold, unemotional, and quick to nurse a grudge against his detractors (and sometimes his closest friends). Fisher’s writing was dense to the point of obscurity, but he dismissed those who couldn’t follow his train of thought. Fisher also dallied with eugenics, at some points arguing that infanticide might justifiably serve an evolutionary function.

Francis Galton. Karl Pearson is usually credited with deriving the formulas for the correlation coefficient, but Francis Galton invented this statistic. That’s not so surprising, as Galton was a compulsive counter. During meetings and lectures he would count the number of fidgets per minute and often try to relate them to the boringness of the subject matter. Twice while having his portrait painted he counted the artist’s brush strokes per hour, and concluded that it takes about 20,000 strokes on average to paint such a picture. Galton also apparently invented a recording device that allowed him to record the beauty of British women as good, medium, or bad.

William S. Gossett. Gossett was a mathematician and chemist who worked at the Guinness Brewing Company. Guinness wanted to take a scientific approach to beer-making, so Gossett’s task was to determine the probability of certain strains of barley producing variable batches of beer. In his spare time he also invented the $t$-test. The results of his brewery efforts were published under the pseudonym “Student,” presumably so that the Guinness Brewing Company wouldn’t have to acknowledge that it sometimes made a bad batch of beer.

Lecture Suggestion 2.7

Correlation is NOT Causation

You can present to your class a number of correlations that reinforce the idea that correlation is not causation. For these correlations, you can either ask your students to generate their own ideas as to why the observed relationships exist or you can explain the underlying causes to them yourself.

- If you go to any elementary school and measure students’ shoe sizes, you will find a strong positive correlation between shoe size and level of academic performance. It isn’t the case that being smart makes your feet grow, but rather as children get older, both their shoe size and their academic ability increase.

- Unmarried men are more likely than married men to wind up in a mental hospital or in prison. So we can say that, for men, marriage is negatively correlated with mental illness and criminal activity. Does the correlation mean that marriage leads to mental health and good social adjustment? Or does it mean that men who are confined to mental institutions or prisons are unlikely to marry?

- Most depressed people have trouble sleeping. Depression is negatively correlated with sleeping well. Does that mean depression causes poor sleep? Or does it mean that people who have difficulty sleeping become depressed? Or does some third variable, such as a dietary deficiency, lead to both depression and poor sleep?
When we examine suburban communities, we notice that there is a positive correlation between the number of sex-related crimes and the number of adult bookstores. While we might be inclined to conclude that adult bookstores cause sex-related crimes, it is also the case that as the size of a community increases so too does the number of crimes and the number of adult bookstores.

**Classroom Exercise 2.7**

**Design an Experiment**

This exercise can be done by itself or as a follow-up to Classroom Exercise 2.2: Theories and Hypotheses. Have students work in groups, and ask them to choose one of the previously developed theories and the theory’s associated hypothesis, or, alternatively, present the groups with a topic for which they have to develop a theory and a hypothesis. Then task each group with designing a research study that would test their hypothesis. In designing their study, students will have to come up with an operational definition for their phenomenon of interest, what their population is, and how they intend to sample from their population. Groups will need to decide what sort of research methodology they want to use and identify their variables of interest. Groups on their own may identify potential confounds in their research, or you can ask the class to evaluate these issues when each group presents their study to the class.

**Classroom Exercise 2.8**

“I’ve Got a Golden Ticket . . .”

You and your students no doubt fondly remember Roald Dahl’s children’s classic, *Charlie and the Chocolate Factory*. Chances are good that some of you read the book, but chances are better that more of you saw the original movie (the 1971 version . . . the good version . . . although Dahl apparently detested it) or its more recent remake, starring Johnny Depp as Willie Wonka. In fact, speaking of chances, you’ll recall that a central theme of the story is that Charlie faces astronomical odds of gaining admittance to Wonka’s factory. Only five golden tickets are distributed worldwide . . . and Charlie, pure of heart, has the good fortune to get one.

You can capitalize on these themes of randomness, fortune, luck, and candy, with a simple demonstration of sampling.

- Gather as many mini packages of M&M’s plain chocolate candies as you’ll need for the number of students in your class. The 1.69-ounce size works best (the kind that typically comes in a big package; shop Costco or Sam’s Club for a good deal).
- Distribute one package to each student, and ask students to open the package and to sort the M&M’s by color.
- They should then count the number of each color and record that information; after that, they’re free to eat the M&M’s (producing a nice positive mood manipulation, by the way!).
As a group, determine one color to focus on (blue? green?), and with the aid of a table of random numbers, select 5 or 10 students to report the number of those M&M’s they had. For example, from the table of random numbers (or visit http://www.random.org), students 4, 12, 18, 20, and 45 might be selected, who each report that they had 3, 1, 3, 2, and 2 green M&M’s in their possession.

Ask all students to calculate the mean of this group, then repeat the process 20 or 30 more times (as class time will allow).

The means of each of the 30 or so samples that result can be plotted on the blackboard, and should reveal the shape of a normal distribution.

Now, ask students to calculate the mean of the means, or the average of all the sample means. This value should be very similar to the population mean, or the average of all of the individual green M&M’s in every student’s possession.

Discussion:

Armed with this information, you can discuss not only the concept of the sampling distribution and its use in inferential statistics, but also the law of large numbers and the importance of sampling in general. Ask your students to consider what would happen if you selected larger samples each time (i.e., if you had collected 30 samples of 20 students each, rather than 30 samples of 5 students each). Also ask them how much faith they would put in any one student’s report on the number of green M&M’s. Would that be indicative of the whole population? What would be a methodological improvement over that, to get better knowledge of the distribution of M&M’s? If the chances of finding five golden tickets in the entire human population seem astronomical, could your students at least estimate the reasonable odds of finding a green M&M in a package selected at random?

Source:


**Classroom Exercise 2.9**

Ripped from Today’s Headlines: Experimentation on the Newsstand

If you’ve been paying attention in the supermarket checkout line lately, you realize there’s no shortage of scientific claims being bandied about. “Drinking human blood cured my cancer!” “Hand size reveals personality type!” “Dreaming in black and white improves sex life!” “Horse predicts gains in the stock market!” Sure, all of these headlines are a little dubious, but then again, consider their source: Star, *Weekly World News*, Globe, and the variety of other weekly tabloids screaming for attention as you pay for your groceries.

You can turn these semi-scientific claims into a fun exercise for your students.
Bring to class a variety of headlines that imply some kind of causality and are (at least vaguely) related to psychology. (You might also ask your students to collect similar headlines and share them during class time.)

Ask your students to propose simple studies that would test the claims made in these reports. From your previous discussions of correlation, causality, and proper experimental technique, your students should have little difficulty identifying the critical methods necessary to give a fair test to these findings.

Discussion: As a follow-up, you might also share more legitimate results from the newsstand. For example, Consumers Union performs many well-designed tests on a variety of consumer products and reports their findings in Consumer Reports magazine. If you subscribe to Consumer Reports, or if there are copies available in your university’s library, use the conclusions and methodology reported there in contrast to what’s typically found in Weekly World News. Your students should be able to identify components of methodology such as sampling, independent variables, dependent variables, control groups, or pretests and posttests. For a further comparison, bring in some issues of other magazines that make recommendations (such as StereoReview or PC Gamer) and point out that often these conclusions are based purely on anecdotal evidence: an author or editor made some comparisons among products and leaned more toward one versus the other.

This exercise should result in your students’ better understanding of many of the core principles of methodology: anecdotal versus empirical evidence, experimental and control groups, correlation versus causality, appropriate sampling, internal validity, and so on. It should also improve their critical thinking skills as they’re weighing the merits of “paper or plastic?”

Sources:


http://www.consumerreports.org/

http://www.soundandvision.com

http://www.pcgamer.com/

Classroom Exercise 2.10

Black Box Psychology

There are a lot of fifty-cent words floating around science: operationalization, deduction, theory, hypothesis, and independent variable come quickly to mind. We in the business know that many times these important-sounding words summarize fairly simple concepts, but students are sometimes stumped by the jargon.
To help unravel the meaning of one of these terms (and to demonstrate the process it reflects), follow the suggestion of Carolyn Hildebrandt and Jennifer Oliver. They recommend using a “black box” exercise to introduce students to the process of theory building.

Take several empty Priority Mail® small flat rate boxes, and place one small movable object and one stationary object in each one. For example, you might allow a marble, a coin, or a key to move around inside the box, and tape a block of Styrofoam, three coins, or a pen to the inside of the box as well.

Depending on the size of your class, you should prepare some boxes in the same way (i.e., the same contents in one or two of them) and other boxes differently.

Tape over the box securely with electrical tape (if you really want to play up the blackness of the box) and number the outside to code its contents (i.e., all boxes with the same number have the same contents; a marble and a taped pen, for example).

Have your students form small groups of 2 or 3 each, and give a box to each group. Tell your students that their task is to draw a picture of the inside of the box. They can manipulate the box in any manner they see fit, but plainly they can’t crack open the box to inspect the contents.

As the groups are pursuing this task, ask them to consider how they went about gathering evidence and what role each group member played. Was one person a “shaker” while another was a “guess generator”? Did one member think of lots of novel ways to test the contents, whereas others focused more on creating an accurate representation? The division of duties in scientific pursuits and the importance of collaboration can be highlighted by these reflections in later discussion.

Ask one member from each group to draw the group’s representation on the board for all to see. You should find that the drawings look very dissimilar to one another.

As you ask your students to comment on their drawings and explain the process by which they reached their conclusions, point out that some groups have identical boxes, yet their processes and resulting pictures probably are very different. How can that be? How can groups start with the same information and reach markedly different conclusions?

Propose that perhaps the groups (1) started from different sets of assumptions about the contents; (2) held different assumptions about the appropriate process of discovery; (3) asked different questions, with some groups focusing on identifying the moving element and ignoring the stationary one, or (4) all had the same information, performed the same tests, but disagreed over the meaning of the data. One group’s “blop blop” noise as the coin rattled from side to side might have been another group’s “slide slide” noise under the same conditions, leading to different interpretations of the information.

What should arise from all this hubbub is a fertile starting point for discussing the processes of theory building and scientific discovery. Psychologists, like all scientists,
start by identifying a problem and then designing appropriate tests to collect the relevant data. Comparison needs to be available; in this case, an “experimental” and “control” group would be represented by comparing the attributes of two dissimilar boxes. Some initial guesses might be proposed, but then refined by replication or the presence of additional data. Indeed, your students might elect to put their boxes through the paces a few more times, or compare similar boxes side by side in the hope of gaining new insights. Finally, you can point out the similarities and differences between the human mind and a black box. It can sometimes be difficult to plumb the depths of the mind, as its contents are largely invisible to the naked eye, and no amount of rattling the head back and forth seems to help! Yet researchers have clearly learned a great deal about thought, feeling, and behavior, and have engaged in the same processes of discovery (as your students just have) to do so.

Source:


**Classroom Exercise 2.11**

Elements of Experimental Design—The Coke-Pepsi Challenge

Introductory psychology students often feel intimidated by the material on research methods, but the fact of the matter is that our students know a lot more about experimental design and research methods than they realize. You can use the basic structure of the classic Coke-Pepsi Challenge to expose your students to a number of important issues in research design. For this demonstration, you tell your students that you are going to be giving them a real-life example of the methods of experimental research using the Coke-Pepsi Challenge, and their responsibility is to identify any methodological problems in the study. You can point out to the class that these are the sorts of analytical, problem-solving skills that all researchers use when they are designing and implementing research studies (or at least should be doing when they are conducting research studies). What you do then is to present a research design that has a number of methodological flaws. Your students will quickly identify many of these flaws. You then identify the methodological concept, essentially labeling the design issue, and then ask students to suggest solutions to these flaws.

As you present this hypothetical study to your class, the number of issues you can cover are limited only by your own creativity. For instance, you can start your presentation by talking about which brand of soda you prefer and how that led you to want to recreate the study. You have just introduced the idea of replication and the issue of demand characteristics. Next, introduce your test materials by presenting one brand in its regular formulation and the other in a diet version. Obviously this is not a fair comparison as the different varieties are not comparable to one another. So you put the diet soda away and pull out the regular version of that brand, but some students will probably point out that your soda tasters shouldn’t know which brand of soda they are tasting, that is, they should be blind to the experimental condition. If you would like, you can initially present
this as a between-subjects design and discuss issues of group assignment, for example, asking students who are Pepsi drinkers to rate Pepsi while your Coke-drinking students rate Coca-Cola. With a between-groups design, your students might point out the problems of confounding variables, for example, what if the two groups differ in soda-drinking experience? Such problems could be remedied by using a within-groups design, and now you can discuss issues such as order effects. You can also present other methodological issues for students to identify by using different types of glasses for the two brands of soda, for example, presenting one in a red cup and the other in a blue cup, or presenting them both in a Coke-branded cup. You might propose to test students in groups and have them verbally report their preferences rather than having them fill out a more private survey instrument.

Depending on the size of your class and the time that you want to allocate to this exercise, you can then conduct the study as specified by your class, collect data, and analyze the results. Furthermore, you can refer back to this exercise throughout the semester as you discuss different research studies.

Multimedia Suggestions

Feature Film: The Wave (1981, 44 min, not rated) This made-for-TV movie remains a gripping illustration of obedience to authority, over 30 years after its release. Bruce Davison portrays a high-school teacher who demonstrates the atmosphere of 1930s Nazi Germany by proclaiming himself the leader of a new movement, called “The Wave.” Soon he, his students, and most of the campus community get swept away by a wave of obedience. The parallels to Stanley Milgram’s classic studies make this film a point of departure for discussing both experimentation and the ethics of experiments.

See the Preface for product information on the following items:

Interactive Presentation Slides for Introductory Psychology 2.1 Statistical Methods

PsychInvestigator Correlation and Statistics

PsychSim 5 Tutorials

What’s Wrong with This Study?

Correlation

Worth Video Series

Video Anthology for Introductory Psychology: Does Self-Confidence Intimidate Others?

Video Anthology for Introductory Psychology: Schachter’s Affiliation Experiment

Video Anthology for Introductory Psychology: Experimental Design
IV. THE ETHICS OF SCIENCE: FIRST, DO NO HARM

(Chapter Objective 17)

Psychologists are acutely aware of the responsibilities that come with conducting research with human and nonhuman animals and adhere to a strict code of ethics. People must give their informed consent to participate in any study, and they must do so free of coercion. The studies also must pose only minimal or no risk to the participant. Enforcement of these principles by federal, institutional, and professional governing agencies, such as an Institutional Review Board, ensures that the research process is a meaningful one that can lead to significant increases in knowledge.

Lecture Suggestion 2.8

Ethics in Perspective

The ethical treatment of research participants is something all psychologists should take very seriously. The American Psychological Association and other governing bodies are clear about what constitutes ethical versus unethical behavior, and awareness of ethical obligations to participants has grown as the field has progressed. Nevertheless, there is a dark side to the history of psychological and medical experimentation—and some of it in the not-so-distant past.

The textbook mentions, for example, the morality of immoral experiments—that is, the use of findings from barbaric and unethical medical experiments. The medical studies performed by Nazi doctors on concentration camp prisoners were as unconscionable then as they are now. Another case is the well-known Tuskegee syphilis studies in the United States. Between 1932 and 1972 almost 400 poor and mostly illiterate African American sharecroppers were denied treatment for syphilis. These patients did not give informed consent to participate in the medical trials, were denied complete information about their diagnosis, and despite the fact that penicillin, discovered in 1947, was an effective treatment, received no information about the treatment or access to the treatment.

In her book *Medical Apartheid*, Harriet Washington points out the long history of medical mistreatment of Black Americans. For example, John Brown, an escaped slave who was owned by a doctor, told a tale in 1855 about how the man had caused deep blisters in Brown’s arms and legs to see “how deep his black skin went.” Thoroughly devoid of any therapeutic value, this “study” clearly would have made Hippocrates wince. From the days of slavery until the recent past, many Black women underwent forced sterilization; in fact, in 1991 an experiment implanted the Norplant birth control device into uninformed African American teenagers. Even more recently, a study conducted in New York between 1988 and 2001 tested potentially dangerous AIDS drugs on African American foster children who had HIV. The parents of the 6-month-old children were often unavailable to provide consent for the procedures.
Psychology, like medicine, is not innocent. The well-known experiments of Stanley Milgram, Phil Zimbardo, and Stanley Schachter (on fear and affiliation, or emotional experience) have raised more than a few eyebrows over the years. Carney Landis, a noted psychologist of the 1920s and 1930s, conducted a series of studies on the experience and expression of emotion. In one set of studies he was particularly interested in capturing facial expressions of emotion, and used strong elicitors of emotion to produce them. For example, one situation involved dropping a lit firecracker underneath an unsuspecting participant’s chair; another involved showing participants pornographic (for their day) photographs and photos of horribly disfiguring skin diseases.

Although these manipulations may seem harsh, Landis used stronger ones, as well. For example, participants were instructed in one situation to plunge their hand into a pail of shallow water that, unbeknownst to them, contained three live frogs. (This manipulation was presumably used to evoke disgust.) To quote Landis: “After the subject had reacted to the frogs the experimenter said, ‘Yes, but you have not felt everything yet, feel around again.’” While the subject was doing so he received a strong . . . shock from an induction coil, attached to the pail by concealed wiring.”

And for the coup de grâce:

“The table in front of the subject was covered with a cloth. A flat tray and a butcher’s knife were placed on the cloth. A live white rat was given to the subject. He was instructed, ‘Hold this rat with your left hand and then cut off its head with the knife.’ . . . In five cases where the subjects could not be persuaded to follow directions the experimenter cut off the head while the subject looked on.”

Mention is also made of a final experiment involving shock which “. . . varied from a just noticeable intensity to a strength which caused the subject to jump from the chair.” Landis’s participants, by the way, included graduate students, a stenographer, a schoolteacher, and a thirteen-year-old boy with high blood pressure.

Although Landis has been singled out for examination here, there are unfortunately no lack of experiments from the 1920s through the 1960s that can provide examples of ethically dubious research. Examining such studies, especially in light of current APA standards, should produce spirited discussion among your students.

Sources:


Lecture Suggestion 2.9

The Ethical Treatment of Research Participants

Informed consent; freedom from coercion; protection from harm. Psychologists hold these truths to be self-evident, but your students might not.

Many times when “ethics” enters a discussion, topics related to it also come along for a spin: personal values, religious views, spiritual ideals, morality, human priorities. These can sometimes serve to make a lively discussion livelier, but sometimes they simply cloud clear thinking on important issues. For example, when weighing the costs and benefits of animal research, someone might be quick to point out that another speaker is wearing a leather belt or ate a hamburger for lunch . . . so there! Although it’s certainly true that all these observations generally have to do with the health and welfare of non-human animals, not all of them have to do with the ethical treatment of research participants or the merits of some scientific pursuits compared with others.

For a more focused discussion of ethical issues, you might point your students to the Ethical Principles of Psychologists and the Code of Conduct developed by the American Psychological Association. A handy version can be found at http://www.apa.org/ethics/code. Of particular note is Section 8.00, which deals with research and publication, although the other sections (focusing on general principles of conduct, guidelines for therapy, education and training, or the merits of bartering with clients) might also interest your students. The APA Web site also has a special section on the ethical treatment of animals as research subjects, which can be found at http://www.apa.org/science/leadership/care/guidelines.aspx. Seven simple sections outline the principles to be applied to this specific area of inquiry.

The APA Guidelines are written in language that most people can readily understand. Ask your students to read them and comment on what they’ve learned. Your students should gain a better appreciation for the conduct of science and be in a better position to evaluate the many studies they’ll read about throughout the textbook. For those who are interested, you might recommend any of the many books available that deal with ethical behavior in psychology.

Sources:


Lecture Suggestion 2.10

The Cyril Burt Affair

“The Cyril Burt Affair” sounds as if it could be a suspense movie or the name of an alternative-rock band. But it really refers to a controversy surrounding Cyril Ludowie Burt, the renowned statistician and promoter of the hereditarian view of intelligence. Almost immediately after his death in 1971, researchers began questioning the validity of Burt’s data on intelligence in monozygotic twins. In 1943 Burt reported a correlation between the intelligence scores of 15 twins raised apart of .770; in 1955, he reported a correlation of .771 for a total of 21 twins, and in 1966 a correlation of .771 for a total of 53 pairs of twins. The startling consistency among these correlations, despite the increases in sample size, led some scholars to level accusations of fraud against Burt. Other scholars, however, claimed that Burt was merely careless and a bit eccentric in his scholarship and that his work remains valid. Ask your students to learn more about these events from psychology’s past, and structure a debate around this issue. What evidence is there on both sides of the issue? How persuasive are the arguments both for and against the accusations of fraud?

Sources:

http://www.intelltheory.com/burtaffair.shtml


Two classic studies in social psychology captured the attention not only of the field, but of the public at large. In the early 1960s, Stanley Milgram was curious about how, why, and to what extent people would follow the orders of an authority, even if it led to disastrous ends. In the late 1960s, Philip Zimbardo wanted to understand the interpersonal dynamics that arose in a prison environment and the effects they would have on both prisoners and guards. The Milgram Obedience Experiments and the Stanford Prison Experiment don’t need much more of an introduction than that, as they have both entered the public consciousness.

Although both research projects revealed a great deal about human behavior, both have also become associated with controversies in research ethics. Your students were no doubt born 20 or 25 years after these studies were conducted, so to them this might be old news; an event from history with little significance in the present day. You can use this fact to your advantage: Ask your students to reconsider the research protocols from an uninformed standpoint.

It helps if your students know little or nothing about these studies. Not so long ago, your introductory psychology course would have been the first exposure most students had to this work; these days, with AP psychology courses in high schools and the wide dissemination of information on the Internet, chances are your students know a bit about both Milgram and Zimbardo. (If you’d like, you can assess the extent of their familiarity beforehand by asking a few questions on a brief survey.)

Ask students to play the role of members of an Institutional Review Board who have received the application materials from either Milgram or Zimbardo. Depending on the size of your class, you might assemble several small groups of five or six students each to perform this task; you might also assign some groups to consider just Milgram or just Zimbardo, or ask each group to consider both.

Philip Zimbardo has placed the original materials for the Stanford Prison Experiment online. They can be found at http://www.prisonexp.org/. Specifically, the following can be found online: a description of the study that was given to participants, http://www.prisonexp.org/pdf/geninfo.pdf; a copy of the Human Subjects Application Form, at http://www.prisonexp.org/pdf/humansubjects.pdf; a copy of the consent form, http://www.prisonexp.org/pdf/consent.pdf; and a copy of the prisoner rules, http://www.prisonexp.org/pdf/rules.pdf. Armed with these documents, your students should have a fairly comprehensive source of information from which to judge the merits of the “proposed” experiment.

Stanley Milgram’s materials are a bit harder to come by. Summaries of Milgram’s studies can be found on Wikipedia (http://en.wikipedia.org/wiki/Milgram_experiment)
and the Association for Psychological Science recognized the recent 50th anniversary of Milgram’s work with a press release, videos, and commentary (http://www.psychologicalscience.org/index.php/news/releases/50th-anniversary-of-stanley-milgrams-obedience-experiments.html). There you can find enough information to re-create a plausible set of IRB application materials if you’d like.

- Ask your students to weigh the pros and cons of the proposals: What does a risk-benefit analysis suggest about the merits of conducting the research?
- Ask your students what potential risks they expect for the participants, and what can be done to protect them from harm (if anything).
- How would the debriefing process proceed?
- Should these studies be conducted at all?

Discussion:

It’s doubtful your students would have the time or wherewithal to conduct a full-scale ethical review of the proposals, but at least you can get them talking. Ask them to share their thoughts, opinions, and knowledge about these studies, and tie it to a larger discussion of research ethics. With a bit of historical perspective and some lively debate, your students should gain insight into the process by which research ideas become research realities.

Sources:


http://www.prisonexp.org

http://www.zimbardo.com


http://en.wikipedia.org/wiki/Milgram_experiment

Multimedia Suggestions

Feature Film: Eternal Sunshine of the Spotless Mind (2004, 108 min, rated R) Jim Carrey and Kate Winslet star as a romantic couple who have lost their romance. They also hope to lose all memory of their time together, so they seek the assistance of
researchers at Lacuna, Inc., to scrub their minds clean of any thoughts of one another. The fictional work of the fictional scientists at fictional Lacuna can nonetheless illustrate aspects of scientific research and the ethics of science.

**Feature Film: Wrong Answer (2005, 7 min, not rated)** At seven minutes, this Australian production is hardly a feature film. But it is a quick re-creation of the basics of Milgram’s obedience experiments. Rhiana Griffith stars as Clare Newell, who volunteers for a psychological study of “the effects of mild electric shock on recall” to make a little cash to pay the rent. In the process she gets more than she bargained for.

See the Preface for product information on the following items:

**Worth Video Series**

- Video Anthology for Introductory Psychology: Ethics in Human Research – Violating One’s Privacy
- Video Anthology for Introductory Psychology: Ethics in Animal Research – The Sad Case of the Booee Chimp

**Other Film Sources**

*Avoiding Plagiarism* (2004, 23 min, IM). This video teaches students the proper way to quote previously published work, cite references, summarize research, and generally avoid the pitfalls of plagiarism.

*The Bigger Picture: Distributions, Variation, and Experiments* (2000, 12 min, IM). A brief overview of central tendency, variability, frequency distributions, correlation, and basic experimental design is provided.

*Discovering Psychology. Part 2: Understanding Research* (2001, 30 min, ANN/CPB). This installment of the critically acclaimed series describes the scientific method and the role of critical thinking in research.

*Do Scientists Cheat?* (1988, 60 min, MICH). This NOVA production examines why scientific fraud is difficult to identify and outlines the many forces that inspire fraud.

*Endless Questions: Critical Thinking and Research* (2006, 30 min, IM). Naturalistic observation, case studies, experiments, correlational research, and surveys are compared and contrasted in this overview of the research process.

*Ethics and Scientific Research* (1992, 30 min, IM). Faking data is bad news; this video tells you why, and addresses other issues related to the ethical treatment of the scientific enterprise.

*How to Conduct an Experiment* (2000, 20 min, IM). As the title says . . . how to conduct an experiment.
The Importance of Lab Animal Research in Psychology: Psychopharmacology (2003, 15 min, APA). Share with your students the issues surrounding animal research, a topic that can inspire strong opinions from a variety of perspectives.

Inferential Statistics (2005, 36 min, IM). This video uses circus metaphors to introduce concepts of probability, significance levels, degrees of freedom, and other basic statistical procedures.

Integrity in Scientific Research (2002, 5 segments, 43 min total, IM). Scientists increasingly face pressures: for primacy of discovery, to publish, to get grants. This video looks at some of the questions surrounding integrity in the research process.

Introduction to Designing Experiments (2005, 23 min, FHS). Many people intuitively understand the problems of confounding variables, the benefits of internal validity, or the necessity of reliable measures. This video illustrates how such intuitions get refined in the research process.

Meaning from Data: Statistics Made Clear (2005, 30 min, IM). Michael Starbird, from the University of Texas at Austin, lectures on the basics of statistics, such as distributions, measures of central tendency and variability, and percentiles.

Observation (2004, 38 min, IM). Naturalistic and subjective observations are discussed in the context of recording children’s behavior.

Organizing Quantitative Data (2005, 37 min, FHS). This video presents effective ways to organize and make sense of data from various research projects.

Presenting and Communicating Research (2004, 23 min, IM). Effective ways of communicating research results orally, in written form, and as multimedia are considered.

Protecting Human Subjects: Balancing Society’s Mandates (38 min, OPRR/NIH). The ethical criteria used in evaluating research are explained by following a research proposal through the review process by an Institutional Review Board (IRB).

Protecting Human Subjects: Evolving Concern (23 min, OPRR/NIH). The historical developments that led to the current federal guidelines to protect human subjects are examined.

Qualitative Research: Methods in the Social Sciences (2006, 20 min, IM). Textual analysis, content analysis, and conversation analysis are the focus of this overview of qualitative methods.

Quantitative Research: Methods in the Social Sciences (2006, 20 min, IM). Validity, sampling, survey design, and scales of measurement are a few of the topics featured in this overview of quantitative research methods.

Research Methods in Psychology (2001, 30 min, IM). This video presents a broad
overview of the many options available to researchers in psychology.

*Research Methods in the Social Sciences* (2005, 4 parts, 23 to 46 min each, FHS). This four-part series explores qualitative and quantitative research methods in a variety of disciplines, although psychology is the main focus. Programs include *Introduction to Designing Experiments, Organizing Quantitative Data, Inferential Statistics*, and *Exploring Qualitative Methods*.

*Scientific Inquiry: Steps, Skills, and Action* (2003, 23 min, IM). From observation to explanation and all points in between, this video offers suggestions for effectively addressing scientific questions.

*Scientific Method* (2000, 23 min, IM). Observation, hypothesis development, experimental testing . . . all the heavy hitters are represented in this brief presentation of the scientific method.

*Statistics* (1989, 3 parts, 360 min total, IM). This series provides a wide-ranging look at statistical techniques. The material is fairly in-depth for an introductory course in psychology.

*Statistics: For All Practical Purposes* (1988, 30 min each, ANN/CPB). Selected segments from this series might profitably be used to illustrate concepts relevant to psychological research.


*Top 10½ Tips for Thinking Scientifically* (1999, 15 min, IM). This brief video introduces basic concepts of critical thinking needed for conducting and evaluating research.

*Two Research Styles* (1991, 24 min, IM). Experimentation and observation are compared using examples from two research programs. This video is a good introduction to the dizzying array of research strategies available to psychologists.

*Understanding Psychology: Experimental Methods in Psychology* (2004, 37 min, IM). Attractiveness research is used as a basis for examining lab and field research, with commentary on the strengths and weaknesses of various experimental approaches.

*Understanding Psychology: Non-Experimental Research Methods* (2006, 32 min, IM). Questionnaires, surveys, interviews, and naturalistic observation are discussed using interviews with experts, staged and actual studies, and expert analyses.

*Why Study Human Behavior?* (2001, 30 min, IM). This introduction to the science of psychology looks at the value and practicality of understanding human behavior.

*Due to loss of formatting, Handouts are only available in PDF format.*