

Chapter 2: Research Methods - Module 2 (.1,.2,.3)

I. General Objective:

The goal of this unit is to introduce students to psychology as a science. This will include various research methods and statistics that are used in the field of psychology. We will also look at the difference between popular and scholarly psychology and touch upon ethics applied to psychology.

II. Resources:

A. Required Reading:

Weiten, W. (2001). Psychology: Themes and Variations, Briefer Version (5th Edition). New York: Brooks/Cole Publishing. Chapter 1

B. Additional Resources and Materials

Funder, D. (2000). The Personality Puzzle (2nd edition). New York: W. W Norton & Company.

Gerrig, R. J. & Zimbardo, P. G. Psychology and life (16th edition). New York: Allyn & Bacon

Sternberg, R. J. (1999). In search of the human mind. New York: Harcourt/Brace

Tabachnik, B. G. & Fidel, L. S. (2001). Using multivariate statistics (4th edition). New York: Allyn & Bacon.

Weiten, W. (1999). Psychology: Themes and variations (3rd edition). New York: Brooks/Cole Publishing.

Personal Notes from Graduate Statistics 907 with Rebecca Warner.

Power point presentation from Myers

Power point presentation from Weiten

C. Test Bank

Multiple Choice Items will be selected from:

Testing Tools, a CD ROM provided by the book publisher.

I will also write some of my own questions on the CD.

III. Specific Objectives/General Outline

Module 2.1

- A. Understand the common misconceptions in psychology
- B. Understand the goals of the scientific enterprise
- C. Know the steps in a scientific investigation

Module 2.2

- D. Understand basic statistical reasoning
- E. Have a basic understanding of what makes a psychological experiment
- F. Have a basic understanding of what correlational and descriptive research entails

Module 2.3

- G. Understand how to look for flaws in research
- H. Understand the difference between scholarly and popular articles.
- I. Have a basic understanding of ethics in psychological research

IV. Detailed Outline

Module 2.1 (Day 1 – Research Methods): Power Point Slides 1-16

Objectives: A) Understand the common misconceptions in psychology, B) Understand the goals of the scientific enterprise, C) Know the steps in a scientific investigation

Recall, this chapter emphasizes...

Theme 2: Psychology is Empirical

Theme 7: Our experience of the world is highly subjective

Start class off with questions:

Does stress lead to physical disease?

Do SAT's predict success?

What ethnic population eats the most?

Scientific enterprise is based on the belief that there are consistencies or laws that can be uncovered. Research is not “common sense.”

A particular problem with commonsense explanations of behavior is that they are made after the fact, when anything is easier to explain. “I knew it all along phenomenon” (Myers, 1996). Goal of psychology is to make predictions, which must take place beforehand.

A. Misconceptions about Science (from Sternberg, 1999)

Misconception 1: Science is Always Correct:

Not really, they are often wrong! Today, we view many of the beliefs of nineteenth-century and even early twentieth-century psychology as “interesting” but not “fact”

E.g., Descartes and the pineal gland (mind/body)

Psychology is always evolving, but not necessarily in an idealized manner.

Misconception 2: Science is Always Conducted in an Idealized Method:

Scientists rarely use the orderly, linear, simplistic scientific method they learned in school. We sometimes make false starts, and have to reconceptualize what we're doing. Sometimes research starts off being one thing and ends being another. For example, studies of why children fail may start off by studying abilities and end with studying motivation, emotion, etc.

Misconception 3: Science is Always Conducted with Perfect Objectivity:

We sometimes fail to reach the goal of being completely objective in deciding what to study, how to study it, and how to interpret the findings. Scientists may seek an interpretation of the evidence that best fits what they already believe (Kuhn, 1970). For this reason and others, scientists should actively seek to disconfirm, not just confirm what they believe (Popper, 1959).

Our values also greatly influence our research (e.g., Sex abuse, cross cultural research, even my own research on emotional intelligence)

(Second example - Murray Strauss in family studies)

Misconception 4: Science is Merely a Collection of Facts:

One of the cultural values that can color our view of science is an emphasis on products (such as facts) above processes (such as the pursuit of knowledge and understanding). This emphasis leads to the misconception that science is merely a collection of facts.

Facts must be presented in a theory (statement of a general principle(s) explaining particular events)

Science is not merely descriptive but also explanatory.

Without theories, we still might be able to describe behavior, or at least to make some discrete observations about behavior, but we would not really understand it.

Advantages of the Scientific Approach

Science, however, is not the only thing used to draw conclusions...

People also use...logic, casual observation, common sense.

But, the advantages are...

1. Clarity and Precision.

Must specify exactly what you are talking about when formulating hypothesis.

2. Intolerance of Error.

Scientists are skeptical

Ideas are subject to empirical tests
Demand objective data

B. Goals of the Scientific Enterprise:

1. Measurement and Description:

- Figure out a way to measure the phenomenon under study.
- Develop a measurement technique that makes it possible to study behavior clearly and precisely (we will discuss this later – e.g., experiment or correlational research).

2. Understanding and Prediction:

- We understand something when we can explain reasons for occurrence.
- Evaluate by making and testing predictions about relationships between variables.

Variables are any measurable conditions, events, characteristics, or behaviors that are controlled or observed in a study.

(E.g. GRE scores, GPA, Sex, Age, Income, Education Status, etc.)

3. Application and Control

- Practical value to help/solve
- Once understand a phenomenon, can exert more control over it.
(E.g. Math anxiety - help students control anxiety)

Other issues related to control:

- Can be even subtler:

For example, if you compliment someone on the clothes he or she is wearing, aren't you saying a subtle message to wear those more often?

We expose people to new information to control them too (e.g., religion, martial arts)

Control is also related to which products you buy (e.g., Coke, etc.)

C. Steps in a Scientific Investigation:

1. Formulate a Testable Hypothesis

Hypothesis is a tentative statement about the relationship between two or more variables.

- Expressed as predictions
- How changes in one variable will change another

Operational definition (of the relevant variables) describes the actions or operations that will be made to measure or control a variable (precisely what is meant by each variable in the context of a study). Usually measured using units.

Example: My research on emotional intelligence. EI is defined as the ability to perceive, integrate, understand, and regulate emotions. It is operationally defined as your total score on these subtests.

One of my hypotheses was that women would be higher in emotional intelligence than men. (they were)

2. Select Research Method and Design the Study

Research methods consist of differing approaches to the observation, measurement, manipulation, and control of variables in empirical studies.

-How to put to an empirical test

-Various methods:

Experiments, case studies, surveys, naturalistic observation (each have advantages and disadvantages)

Subjects are the persons or animals whose behavior is systematically observed in a study.

Example: In my research I used an ability test (EI) and surveys (life space).

3. Collect the Data

Data collections techniques are procedures for making empirical observations and measurements. (Direct observation, questionnaires, interviews, tests, physiological recordings, examination of archival records). Depends on what you want to study.

Example: I carefully planned to spend 1 month collecting my data because I wanted 1st year students who had just arrived on campus.

4. Analyze the Data and Draw Conclusions

-Observations usually converted into numbers (raw data)

-Use statistics to analyze data and to decide whether hypotheses have been supported.

Statistics is the use of mathematics to organize, summarize, and interpret numerical data. (We will look at this in our next class)

Example: I factor analyzed the life space (explain in simple terms). I also correlated EI with the life space scales and found a relation between EI and deviant behavior. (Other strange correlations appeared that were not predicted. These could be real or they could be issues of type 1 error)

5. Report the Findings.

Share findings with others.

A **Journal** is a periodical that publishes technical and scholarly material, usually in a narrowly defined area of inquiry.

I submitted my research to JPSP, which is one of the top journals in my field of psychology. Experts in the field will evaluate and critique my work.

End of Module 2.1

Module 2.2 (Day 2): Power Point Slides 17-34

Objectives: D) Understand basic statistical reasoning, E) Have a basic understanding of what makes a psychological experiment, F) Have a basic understanding of what correlational and descriptive research entails

D. Basic Statistical Reasoning (Vocabulary)

Many research techniques use statistics to see whether a difference between two or more groups, for example, is statistically significantly different.

Basic Vocabulary Terms:

Mode - most frequently occurring score in a distribution

Mean - arithmetic average of a distribution

Median - middle score in a distribution (half are above/half are below)

Range – the difference between the highest and lowest scores in a distribution

Standard Deviation – a computed measure of how much scores vary around the mean.

Statistical Significance – a statistical statement of how likely it is that an obtained result occurred by chance.

E. Looking for Causes: Experimental Research

An experiment is a research method in which the investigator manipulates a variable under carefully controlled conditions and observes whether any changes occur in a second variable as a result.

Schacter (1959): N for affiliation. Ho: increases in anxiety would increase the desire to be with others.

Independent and Dependent Variables:

Purpose is to find if changes in X cause a change in Y (how affects)

An independent variable is a condition or event that an experimenter varies in order to see its impact on another variable. (the variable that is controlled or manipulated)

The dependent variable is the variable that is thought to be affected by manipulation of the independent variable. (usually the measurement of some aspect of the subjects' behavior.

Schacter's experiment (affiliation):

IV was the subjects' anxiety level (high or low) DV was affiliation

-Told by Dr. Z that they would be doing a study on the physiological effects of electric shock and that they would receive shocks while blood pressure and heart rate were monitored.

Half warned would be painful (High anxiety), other Half told would be mild (Low)

No real plan to shock anyone. Subjects were told that there would be a delay and asked if would prefer to be alone or in company others.

Experimental and Control Groups:

The **Experimental** group consists of the subjects who receive some special treatment in regard to the IV. The **control** group consists of similar subjects who do not receive the special treatment given to the experimental group. Affiliation study: High anxiety (experimental)

-Important for the two groups to be similar except for the treatment (IV)

If they are similar, then differences can be from the IV

Schacter found that increased anxiety leads to increased need for affiliation.

In Experimental differences, we look for mean score differences (e.g., t test, ANOVA)

Advantages and Disadvantages of Experimental Research:

Advantage: Permits conclusions about cause and effect relationships.

Disadvantages:

1. **Artificial:** Because require great control over proceedings, researchers construct simple, contrived situations to test their hypotheses.
E.g. reading a trial (race issues) versus real trial.
-Doubt arises about the applicability of the findings to everyday behavior (outside lab)
2. Can't be used to explore some research questions.
-Ethical Concerns or Practical Realities
E.g. Bad nutrition during pregnancy related to birth defects.

F. Descriptive/Correlational Research:

Researcher cannot manipulate the variables under study. The methods cannot be used to demonstrate a cause and effect relationship between variables. See a link or association between the variables of interest. (Correlation, Correlation Coefficient).

Three Types: Naturalistic observation, Case studies, Surveys.

Correlation Concept:

A correlation exists when two variables are related to each other.

Can be positive or negative

Positive: a direct relationship between two variables

High on X means High on Y

High school GPA - College GPA

Negative: an inverse relationship between two variables.

High on X low on Y.

E.g., Absent from class and Performance.

Strength of Correlation:

The correlation coefficient is a numerical index of the degree of relationship between two variables. (-1 0 +1)

-If near 0, no correlation.

-Near +1 or -1 means strong correlation

- Strength only depends on size of correlation.
E.g. -.9 better than .3

Correlation and Prediction:

(Key goal is accurate prediction)

As strength increases, ability to predict increases.

School Admissions: Correlation with SAT and GPA... how well will do in college.

Correlation and Causation:

Variables can be highly correlated even though they are not causally related.

We don't know how they are related.

E.g., Marital Satisfaction and Sexual Satisfaction (Hunt, 1974). Which is cause?

Surveys:

In survey, researchers use questionnaires or interviews to gather information about specific aspects of subject's behavior.

- Often used to obtain information on aspects of behavior that are difficult to observe directly (sexual behavior).
- Easy to collect data

-Problem:

Self reported data: Intentional deception, wishful thinking distort reports.

E.g. Karen Rapaport and Barry Burkhart (1984).

Coercive sexual behavior (sexual act against will).

- Questionnaire to 201 college men.
- Inquired whether subjects had ever engaged in one of 11 coercive acts.
- Many men had engaged in sexually coercive acts.

Naturalistic Observation:

In **naturalistic observation**, a researcher engages in careful, usually prolonged, observation of behavior without intervening directly with the subjects.

Ginsburg and Miller (1982). Boys' and girls' risk taking behavior.

- Found 4 risky behaviors for children at the zoo.
 - Ride on elephant; petting a burro; feeding animals; climbing a steep embankment.
- Recorded number of each group.
- Boys engaged in more risky behavior than girls.

Strength of naturalistic observation:

Less artificial than experiments

Weakness:

Hard to make observations unobtrusively so they don't effect subject's behavior.

Case Studies:

A **case study** is an in-depth investigation of an individual subject.

-Dr. Lewis's research on Inmates with head injuries

Strong unexpected correlation between neurological impairment and ending up on

death row.

-My study on adopted murders.

-Interview Subjects, Observations, Records, Testing.

(Clinical Psychologists work)

Problem: Highly subjective

Advantages and Disadvantages of Descriptive/Correlational Research.

Advantage: Can explore questions that they could not examine with experimental procedures.

E.g. After-the-fact analyses would be only way to investigate possible link between poor maternal nutrition and birth defects in humans.

-Descriptive research broadens the scope of phenomenon that psychologist are able to study.

Disadvantage: Investigators cannot control events to isolate cause and effect.

E.g. Although Ginsburg and Miller found an association between sex and risk taking, their data do not permit us to conclude that a child's sex causes these differences. Too many factors were left uncontrolled in the study. Don't know how similar groups were (age, other factors)

Class Exercise:

Which research method would you use?

A psychiatrist wants to do an in depth investigation of serial killers.

A developmental psychologist wants to study how children behave in groups.

A personality psychologist wants to see which personality type leads to happiness?

End Module 2.2

Module 2.3 (Day 3): Power Point Slides 35-44

Objectives: G) Understand how to look for flaws in research, H) Understand the difference between scholarly and popular articles, I) Have a basic understanding of ethics in psychological research

G. Looking for Flaws in Research

Many studies have methodological problems with IV's and even DV's

E.g., Cola test.

Which colas was sampled first, second (counterbalancing)?

Are sex differences important?

Does age matter (taste buds decrease)?

Same temperature?

Color, Fizz differences

Rinse mouth first?

Eat prior, drink coffee prior?

Ratings made after each or after both?

Simple preference or Likert scale measurement?

Extraneous Variables:

Impossible to ensure that the two groups are exactly alike in every aspect.

They only have to be alike on the dimensions that are relevant to the dependent variable.

(for example, Schacter didn't care about hair color, height, etc.)

Extraneous variables are any variables other than the independent variable that seem likely to influence the dependent variable in a specific study.

E.g., In Schacter's study: sociability of subjects.

A confounding of variables occurs when two variables are linked together in a way that makes it difficult to sort out their specific effects.

When this happens, researcher cannot tell which is having the effect on the DV.

Avoid confounding by Random Assignment.

Random assignment of subjects occurs when all subjects have an equal chance of being assigned to any group or condition in the study.

***Optional class example of random assignment:** Could do an experiment with the class by having the students be picked for a team. Just flip a coin and have 10 on each side.*

Sampling Bias:

A sample is the collection of subjects selected for observation in an empirical study. In contrast the **population** is the much larger collection of animals or people (from which the sample is drawn) that the researchers want to generalize about.

-All voters represent a population, the surveyed ones constitute the sample.

-Sample is a reasonable representative of the population.

-**Sampling bias** occurs when a sample is not representative of the population from which it was drawn.

E.g., Some studies only used Ivy League institution.

-Limits on time and money often prevent researchers from obtaining representative samples.

-When have doubts, examine the sample.

Placebo Effects occur when subjects' expectations lead them to experience some change even though they receive empty, fake or ineffectual treatment.

-Placebos are given to some subjects to control for the effects of a treacherous extraneous variable: subjects' expectations (which can effect their feelings, reactions, and behavior).

Distortions in Self-Report Data:

Self-report methods can be useful, taking the advantage of the point that people have the unique opportunity to observe themselves full-time.

Social Desirability Bias: a tendency to give socially approved answers to questions about oneself.

-Create favorable impression. Misunderstanding of questions. Memory

Experimenter Bias:

Objectivity is a goal that psychologists strive for.

-Most have emotional interest in what they study. Testing their own hypotheses

Experimenter Bias: occurs when a researcher's expectations or preferences about the outcome of a study influence the results obtained.

-Researchers see what they want to see.

-Mistakes tend to follow the hypothesis.

Rosenthal (1976). Experimenter bias may unintentionally influence the behavior of their subjects by sending subtle, nonverbal signals as the experiment progressed. (smiled, nodded, etc.)

-Influences both researchers' observations and their subject's behavior.

-Photos with neutral ratings.....Half told -5 other half +5

-Experimenters only read instructions.

-Experimenters who expected got what they wanted.

Double Blind procedure: a research strategy in which neither subjects nor experimenters know which subjects are in the experimental or control groups.

Replication is important

Replication is the repetition of a study to see whether the earlier results are duplicated.

-Helps to identify and purge erroneous findings.

-Sometimes leads to contradictory results. Can be positive for new findings.

For example, my research on EI is very limited. I only used white UNH undergraduates. Will the study replicate at other colleges? What about in non-college educated populations?

H. A look at Ethics (see Gerrig & Zimbardo, 2001)

Informed Consent

At the start of nearly all laboratory research with human subjects, participants are given a description of the procedures, potential risks, and expected benefits they will experience.

Participants are also assured that their privacy is protected.

All records are kept confidential; and participants must approve any public sharing.

Participants must sign a form indicating that they have been informed about these matters, and consent to continue.

Participants are assured in advance that they may leave any time, without penalty, and are given the names and phone numbers of officials to contact if they have any grievances.

Risk/Gain Assessment

Most experiments carry little risk to the participants, especially where participants are merely asked to perform routine tasks.

However, some experiments may be psychologically disturbing.

Here is where the IRB has its challenges.

Intentional Deception

For some kinds of research, it is not possible to tell the participants the whole story in advance without biasing the results. (E.g., Does violence on television effect aggression?)

Over the years experimenters have faked fights, thefts, muggings, seizures, rapes, hurt others with eclectic shocks, and had subjects overhear negative comments about themselves.

-Deception only a nice word for lying (inherently immoral)

-Deceiving unsuspecting subjects may undermine individual's trust in others.

-Produce distress for subjects who were not forewarned.

Defenders (many psychologists) say things could not be investigated without it.

(Example from Benassi's class)

The APA has some guidelines for this, including:

- 1) The study must have sufficient scientific and educational importance to warrant deception.
- 2) Researchers must demonstrate that no equally effective procedures excluding deception are available.
- 3) Participants may never be deceived about aspects of the experiment that would affect their willingness to participate.
- 4) The deception must be explained to the participants by the conclusion of the research.

Debriefing

Participation in psychological research should always be a mutual exchange of information between researcher and participant. The researcher may learn something new about a behavioral phenomenon from the participant's responses, and the participant should also be informed of the purpose, hypotheses, anticipated results, and expected benefits of the study.

At the end of an experiment, a research must provide as much information about the study as possible and makes sure that no one leaves feeling confused, upset, or embarrassed. If deception was used, the experimenter should carefully explain the reason for the deception. Finally, participants can withdraw their data if they feel they have been misused.

The Question of Animal Research:

Only about 7-8% of all psychological studies involve animals (mostly rodents and birds and few get painful treatments) - APA committee on ethics

Benefits of using animals include... discovery and design of drugs that treat anxiety and other mental illness, as well as information on drug addiction.

Defenders of animal rights say that there is a "morally relevant difference separating Homosapiens from other creatures."

How would we do an experiment on "the relationship between deficient maternal nutrition during pregnancy and the incidence of birth defects?"

(Can't use people, but the information is important!)

I. Scholarly versus Popular Research

Class Exercise:

"How to tell a scholarly journal from a popular magazine article"

(Handout)

Here, we will also go over the students' assignments on popular tests in psychology.

Example from Personality Psychology: *Emotional Intelligence*

Scholarly: Salovey & Mayer (1990, 1997, 2000)

Measured using the MSCEIT (ability test)

Four Branches:

Perception, Integration, Understanding, Regulation of Emotion

Popular: Goleman (1995, 1998); Bar-On (1997)

Measured using a self-report test array of non-cognitive capabilities, competencies, skills, and personality traits have considerable overlap with traditional personality measures

End, Module 2.3

V. Table of Specifications:

	Objectives	factual	conceptual	total
A.	Understand common misconceptions in psychology	21, 22		2
B.	Understand the goals of the scientific enterprise	25	27	2
C.	Know the steps in a scientific investigation	32, 34	38	3
D.	Understand basic statistical reasoning	107	87	2
E.	Have a basic understanding of what makes a psychological experiment	51	50, 60, 65	4
F.	Have a basic understanding of what correlational and descriptive research entails	72, 94	74, 78, 81, 102	6
G.	Understand how to look for flaws in research	125	114, 120	3
H.	Have a basic understanding of ethics in psychological research	129		1
I.	Understand the difference between scholarly and popular psychology.	134	149	2
	Total:	12	13	25

VI. Exam Questions:

– See attached.

End - Module 2 (Chapter 2)