# Chapter 2: The Research Enterprise in Psychology

### Looking for Laws: The Scientific Approach to Behavior

- Basic assumption: events are governed by some \_\_\_\_\_\_
- Goals:

## Why Do Research?

## Common sense...

Common sense is the collection of prejudices acquired by age eighteen. Albert Einstein

Is not enough

### bias

- Tendency to believe, after learning an outcome, that one would have \_\_\_\_\_\_ it
- Example: effects of absence on love
- We tend to think \_\_\_\_\_ than we do
- Prediction of our own behavior

## **Examples of overconfidence**

- Word search
  - In reality, most participants took 3+ minutes
- Prediction of social behavior (Vallone, 1990)
  - Students who felt that they could predict their behavior with 84% confidence were correct only 71% of the time
- Prediction of your behavior...

is the only way to really know!!!

## Features of Psychology Research

## (hopefully)

- Research questions based on , with specific, refutable (more on this later)
  - System of \_\_\_\_\_ used to explain a series of observations
  - Specifies relationships among \_\_\_\_\_, and are \_\_\_\_\_

### definitions

- define terms in hypotheses by specifying the for observing and measuring the process or phenomenon.
- Clarifies exactly what is being studied.

## **Problem with Precision**

- Often, very difficult to achieve!
  - Especially with "applied" research
  - Lots of extraneous variables that are difficult to control
- Example
  - Positive interactions with peer improves self-esteem
  - Potential

- Scientists do not accept ideas on faith or authority.
- means treating conclusions, both old and new with caution.
- Example
  - Claim: People emit auras, which can be seen by those trained to do so.
  - Test:???

## **Skepticism: Science v.**

= "false science"

- Characteristics:
  - associates itself with \_\_\_\_\_
  - relies on and accepts \_
  - sidesteps
    - Does not make refutable, testable predictions
  - dangerously reduces complexity to (to a consumer society)

# **Critical Thinking: Zodiac Signs**

- Astrologers say that behavior can be predicted by zodiac sign
- Testable hypotheses?
- Zodiac Personality Characteristics
- Correspondence?

# Reliance on

# evidence

A scientist relies on \_\_\_\_\_\_
evidence to determine whether a

is true.

• Evidence is evaluated based on accepted standards.

# Willingness to make "risky

"

- Principle of \_
  - A scientific theory must make predictions
     \_\_\_\_\_ enough to confirm and or disconfirm the theory; that is,
  - the theory must predict not only what will happen, but also \_\_\_\_\_\_.

### bias.

Tendency to look for or pay attention only to information that \_\_\_\_\_.



- Scientists must be willing to tell others where they got their ideas, how they tested them and what the results were.
- Peer review, publishing and replicating research gives science a built in system of

## **General Research Process**

- Find a topic of interest
- Review
  - Allows generation of better hypotheses
  - Make sure no one has done what you're interested in
- Develop your \_\_\_\_\_\_ and procedures
  - Formulate
  - Design the study
- Undergo \_\_\_\_\_
  - Human Institutional Review Board (IRB)
  - Animal Institutional Animal Care and Use Committees
- Collect and analyze \_\_\_\_\_
- Write \_\_\_\_\_, submit, & publish

## **Scientific Method in Psychology**

Careful \_\_\_\_\_ of behavior

- Can't observe everybody (whole

- Select an unbiased
- Conduct
  - Ask everybody the same questions...
  - Same experiment, etc.
- Critical thinking

## **Focus of Studies:**

- Measurable conditions, events, characteristics, or behaviors;
- Manipulated and assessed in scientific studies
  - Question:
    - What is the effect of \_\_\_\_\_?

#### Table 2.1 Key Data Collection Techniques in Psychology

Technique	Description
Direct observation	Observers are trained to watch and record behavior as objectively and precisely as possible. They may use some instrumentation, such as a stopwatch or video recorder.
Questionnaire	Subjects are administered a series of written questions designed to obtain information about attitudes, opinions, and specific aspects of their behavior.
Interview	A face-to-face dialogue is conducted to obtain information about specific aspects of a subject's behavior.
Psychological test	Subjects are administered a standardized measure to obtain a sample of their behavior. Tests are usually used to assess mental abilities or personality traits.
Physiological recording	An instrument is used to monitor and record a specific physiological process in a subject. Examples include measures of blood pressure, heart rate, muscle tension, and brain activity.
Examination of archival records	The researcher analyzes existing institutional records (the archives), such as census, economic, medical, legal, educational, and business records.

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 Table 2.1 Key Data Collection Techniques in Psychology

	Looking for Causes:					
	Research					
•	= manipulation of one under					
	conditions so that resulting changes in					
	another can be observed					
	– Detection of					
•	= variable manipulated					
•	= variable affected by					
	manipulation					
	– How does X affect Y?					
	-X = Variable, and Y =					
	Variable					

## **Identifying IVs & DVs**

- Which is the best method of treatment for depression: cognitive-behavioral therapy, drug treatment, or no treatment control?
- Is it better to "cram" for a test (massed practice) or better to "space-out" our studying (distributed practice) when trying to remember information for an exam?
- Does the number of people present affect the likelihood that someone will help another person in need?
- Is overall health influenced by one's deepest thoughts, feelings, and attitudes about coming to college?

## **Quick Quiz**

Professor Zappy wants to study the effects of shock on student learning. The dependent variable is:

- A. Shock
- B. Student learning
- C. Professor Zappy
- D. None of the above





Figure 2.4 The basic elements of an experiment

### Experimental Designs: \_\_\_\_

- Expose a \_\_\_\_\_ group to two \_\_\_\_\_ conditions
   Reduces \_\_\_\_\_\_ variables
- Manipulate more than one \_\_\_\_\_\_
  variable
  - Allows for study of interactions between variables
- Use more than one \_\_\_\_\_\_ variable
   Obtains a more complete picture of effect of the independent variable



### **The Concept of Correlation**

- \_\_\_\_\_ of relationship
  - \_\_\_\_\_ of relationship
  - Correlation \_
- Correlation and \_

#### **Positive correlation**

High scores on X are associated with high scores on Y, and low scores on X are associated with low scores on Y.

#### **Negative correlation**

High scores on X are associated with low scores on Y, and low scores on X are associated with high scores on Y.



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Figure 2.6 Positive and negative correlation

# **Correlation and Causation**

- Correlation shows the strength of the between two variables.
  - A correlation between two variables does not imply that one variable the other.
- Correlation \_\_\_\_\_ mean causation!

# **Correlation Coefficient**



# **Correlation Coefficient**



First Semester GPA

# **Correlational Research**



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#### CNN.com > health

### Violent behavior and TV viewing

Researchers at Columbia University and the New York State Psychiatric Institute tracked more than 700 boys and girls over 17 years. The following shows daily number of television viewing at mean age 14 and the percentage of aggressive acts then committed at mean age 16 or 22.

×

	Study Group	Less than 1 hour	1 to 3 hours	3-plus hours				
ASS	<b>SAULT OR PHYSICA</b>	L FIGHTS RESULT	ING IN INJURY					
	Males Females Total	8.9 % 2.3 % 5.7 %	27.5 % 8.6 % 18.4 %	41.7 % 9.3 % 25.3 %				
RO	BBERY, THREATS TO	INJURE ANOTH	IER OR WEAPON US	SED TO COMMIT CR	RIME			
	Males Females Total	6.7 % 0 % 3.4 %	14.0 % 4.8 % 9.6 %	20.9 % 8.5 % 14.6 %				
AN	ANY AGGRESSIVE ACT AGAINST OTHERS							
Source: Science Maga	Males Females <sub>zine</sub> Total	8.9 % 2.3 % 5.7 %	32.5 % 11.8 % 22.5 %	45.2 % 12.7 % 28.8 %				
presented by		FULL BLITZ FA	NTASY FOOTBALL from ( FICE LEGENDS AR	ENNSLE CNN (fro E MAI Science) march 20	m )02			

### What was that study?

#### Table 4

Correlations between media habits and parental limits and outcomes (n = 399-586)

noning	with teachers	fights	
0.20***	0.12*	0.21***	-0.25***
0.20***	0.10*	0.12***	-0.20***
$-0.08^{\dagger}$	-0.17***	-0.07	$0.07^{+}$
0.21***	0.20***	0.32***	-0.23***
0.31***	0.25***	0.36***	-0.34***
0.23***	0.16**	0.19***	-0.14**
-0.14**	-0.27***	-0.18***	0.27***
	$0.20^{***}$ $0.20^{***}$ $-0.08^{\dagger}$ $0.21^{***}$ $0.31^{***}$ $0.23^{***}$ $-0.14^{**}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

p < 0.09; p < 0.05; p < 0.01; p < 0.001; p < 0.001.

### But yet...



17



# **Correlation and Causation**



## Correlations

- The perception of a relationship where
- Examples
  - Sugar makes children hyperactive
  - Getting cold & wet will make you sick
- Related to perception of \_

in

- What are the odds of being dealt:
  - J (hearts), Q (hearts), A (hearts), K (hearts), 10 (hearts)
  - 9 (spades), 3 (diamonds), 5 (clubs), 8 (clubs), 6 (hearts)
- One reason why we can't rely on anecdotal evidence!

### **Methods**

 Methods used when a researcher cannot the variables under study
 <u>observation</u>

#### Overview of key research methods in psychology

Research method	Description	Example	Advantages	Disadvantages	
Experiment	Manipulation of an independent variable under carefully controlled conditions to see whether any changes occur in a dependent variable	Youngsters are randomly assigned to watch a violent or nonviolent film, and their aggression is measured in a laboratory situation	Precise control over variables; ability to draw conclusions about cause-and- effect relationships	Contrived situations often artificial; ethical concerns and practical realities preclude experiments on many important questions	
Naturalistic observation	Careful, usually prolonged observation of behavior without direct intervention	Youngsters' spontaneous acts of aggression during recreational activities are observed unobtrusively and recorded	Minimizes artificiality; can be good place to start when little is known about phenomena under study	Often difficult to remain unobtrusive; can't explain why certain patterns of behavior were observed	
Case studies	In-depth investigation of a single participant using direct interview, direct observation, and other data collection techniques	Detailed case histories are worked up for youngsters referred to counseling because of excessive aggressive behavior	Well-suited for study of certain phenomena; can provide compelling illustrations to support a theory	Subjectivity makes it easy to see what one expects to see based on one's theoretical slant; clinical samples often unrepresentative	
Surveys	Use of questionnaires or interviews to gather information about specific aspects of participants' behavior	Youngsters are given questionnaire that describes hypothetical scenarios and are asked about the likelihood of aggressive behavior	Can gather data on difficult-to-observe aspects of behavior; relatively easy to collect data from large samples	Sef-report data often unreliable, due to intentional deception, social desirability bias, response sets, memory lapses, and wishful thinking	

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#### Figure 2.10 Comparison of major research methods

### **Evaluating Research: Methodological Pitfalls**



## **Ethics of Research**

# **The Ethics of Studying Humans**



- Freedom to \_\_\_\_\_\_ at any time.
- Minimize \_
- Keep data
- If \_\_\_\_\_ is necessary, debriefing must occur.

#### APA Ethical Guidelines for Research

1

A subject's participation in research should be voluntary and based on informed consent. Subjects should never be coerced into participating in research. They should be informed in advance about any aspects of the study that might be expected to influence their willingness to cooperate. Furthermore, they should be permitted to withdraw from a study at any time if they so desire.

Participants should not be exposed to harmful or dangerous research procedures. This guideline is intended to protect subjects from psychological as well as physical harm. Thus, even stressful procedures that might cause emotional discomfort are largely prohibited. However, procedures that carry a modest risk of moderate mental discomfort may be acceptable.

3

If an investigation requires some deception of participants (about matters that do not involve risks), the researcher is required to explain and correct any misunderstandings as soon as possible. The deception must be disclosed to subjects in "debriefing" sessions as soon as it is practical to do so without compromising the goals of the study. Subjects' rights to privacy should never be violated. Information about a subject that might be acquired during a study must be treated as highly confidential and should never be made available to others without the consent of the participant.

Harmful or painful procedures imposed upon animals must be thoroughly justified in terms of the knowledge to be gained from the study. Furthermore, laboratory animals are entitled to decent living conditions that are spelled out in detailed rules that relate to their housing, cleaning, feeding, and so forth.

6

Prior to conducting studies, approval should be obtained from host institutions and their research review committees. Research results should be reported fully and accurately, and raw data should be promptly shared with other professionals who seek to verify substantive claims. Retractions should be made if significant errors are found in a study subsequent to its publication.

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# The Ethics of Studying

- have always been used in a small percentage of psychological studies.
  - To conduct basic research on particular species.
  - To discover practical \_
  - To study issues that cannot be studied experimentally with \_\_\_\_\_
  - To clarify \_\_\_\_\_ questions.
  - To improve \_\_\_\_\_.

## **Ethics of Studying**

- IACUC
  - Reviews all procedures to be conducted with animals
  - Must use the "\_\_\_\_\_" animal species possible
    - Cell cultures
    - •
    - •
- Rodents & birds
- Larger mammals (dogs & cats  $\rightarrow$  apes)

Ethics in Psychological Research: Do the Ends Justify the Means?

- The question of
- The question of
  - Controversy among psychologists and the public
- Ethical standards for research: the American Psychological Association
  - Ensures both human and animal subjects are treated with dignity