Question: What steps do scientists follow in conducting scientific research?

In psychology, assumptions must be supported by evidence.

STEPS IN SCIENTIFIC RESEARCH

1. Form a research question – best directed toward behavior, not a construct.
   (see next slide)
Sources for Research Questions

Daily Experience
What do fighting fish do when placed together?

Psychological Theory
What effect (if any) does watching TV violence have on viewers?

Folklore or Common Knowledge
Is it true that “Two heads are better than one”?

What effect (if any) does watching TV violence have on viewers?

What do fighting fish do when placed together?

Is it true that “Two heads are better than one”?
Question: What steps do scientists follow in conducting scientific research?

STEPS IN SCIENTIFIC RESEARCH

1. Form a research question
2. Form a hypothesis (an educated guess; often an If-then statement; “IF fighting fish are aggressive, THEN they will attack one another”)
3. Test the hypothesis (examine the evidence through any of a variety of means)
Question: What steps do scientists follow in conducting scientific research?

4. Analyze results (look for patterns or relationships in the evidence)
5. Draw a conclusion (determining whether the findings support the hypothesis and adjusting it if they do not)
1. Form a Question
2. Form a Hypothesis
3. Test the Hypothesis
   - Decide what information is needed to test hypothesis
   - Gather information
   - Examine information
   - Is information sufficient to test hypothesis?
   - No
   - Yes
4. Analyze Results of Test
5. Draw a Conclusion
   - Was hypothesis correct?
   - No
   - Yes
   - Replication
Question: What steps do scientists follow in conducting scientific research?

Replicate - the study must be repeated (sometimes under slightly different conditions or with different participants) and show the same results (ESP - studies have not been successfully replicated)

New questions – can be created through the study and new studies conducted

End Section 1: Homework: p. 29, #1,2
Survey Method – asking people directly

Interview

Advantages
1. Observe facial expressions / body language
2. Can clarify questions

Disadvantages
1. People may respond how they think interviewer wants them to.
2. Time-consuming
Survey Method - Questionnaire

Advantage
1. Get large amount of data in short period of time

Disadvantages
1. People may not be honest (confidentiality)
2. May not understand the question
3. May throw it away
Section 2: Surveys, Samples, and Populations

Question: Who will your survey include?

Town referendum on 10:00pm curfew. Will it pass?
Survey High School Students?
NO – they cannot vote
Only voters would be relevant to the survey.
Target Populations – the people you want to study or describe.
ALL VOTERS would be the target population, but may be too big to survey.
Use Sampling (survey only part of the target population)
Question: Why are proper sampling techniques important?

IMPORTANCE OF PROPER SAMPLING TECHNIQUES

Samples must be selected scientifically to ensure that the samples accurately represent the target populations they are supposed to represent.

Random samples – individuals selected by chance from the target population (must be big enough to represent population)

Stratified samples – subgroups represented proportionally in the sample (Figure 2.3 – p. 31)
Generalizing Results – be careful not to generalize outside of your sample group (Don’t generalize to women if only men used in study or to the whole country if you only observe one part)

Volunteer bias – volunteers may have different outlooks than non-volunteers (results may be skewed)

End Section 2. HW – p.34, #1,2
Question: What are the various methods of observation, and how is correlation used in analyzing results?

METHODS OF OBSERVATION

- Survey Method
- Testing Method – tests measure various elements of human behavior such as intelligence (IQ tests), interests (aptitude tests), and personality (personality tests)
- Case-study Method – in-depth investigations of individuals or small groups (difficult to replicate)
Question: What are the various methods of observation, and how is correlation used in analyzing results?

METHODS OF OBSERVATION (continued)

- Longitudinal Method – participants are observed at intervals over an extended period of time (years, even decades)
- Cross-Sectional Method – compare people in different age groups at the same time (not as reliable)
Question: What are the various methods of observation, and how is correlation used in analyzing results?

METHODS OF OBSERVATION (continued)

- Naturalistic-Observation Method – (field study) observe the behavior of people or animals in their natural habitats
- Laboratory-Observation Method – participants are observed in a fixed environment that can be controlled

QuickTime Movie (2.5 min.) – “The Sound of Crying”
Question: What are the various methods of observation, and how is correlation used in analyzing results?

CORRELATION

- Correlation measures how closely one thing is related to another
Correlation does NOT reveal cause and effect

End Section 3. HW – p. 40, #1-3.
Question: What are the purposes and elements of experiments?

PURPOSES AND ELEMENTS OF EXPERIMENTS

- Researchers conduct experiments to learn about cause and effect.
- Elements of experiments include:
  - Independent variable - factor that researcher can manipulate
  - Dependent variable – depends on the independent variable
  - Experimental group – receives treatment
Control group – does not receive treatment

Example: “Does violence on TV cause children to be violent?”

Ind. Var. – violence on TV
Dep. Var. – children’s behavior
Exp. Group – shown violent show
Control group – not shown violent show
(Show both groups nice show first)
Question: What are the purposes and elements of experiments? (continued)

Placebo effect – treatment has no effect other than person’s belief in the treatment

Single-blind studies – participants do not know if they are in experimental or control group

Double-blind studies – researchers and participants are both unaware (required by FDA)
Chapter 2

Section 4: The Experimental Method

Question: What are the purposes and elements of experiments? (continued)

Central Tendencies and Dispersion – determined using range (low score subtracted from the high) and standard deviation (measure of each score from the mean)

Large range means higher standard deviation, small range means small standard deviation.

End Section 4. HW – p. 44, #1-3.
Question: How are ethical issues involved in psychological research?

ETHICAL ISSUES AND RESEARCH

- Protect study participants from harm (infant separation studies)
- Maintain the scientific integrity of the study
- Promote the dignity of the individual
- Foster human welfare and lessen suffering
- Confidentiality (privacy)
- Informed Consent
- Deception only used in special conditions (p. 46)
Chapter 2

Section 5: Ethical Issues

Question: How are ethical issues involved in psychological research?

ETHICAL ISSUES AND RESEARCH (continued)

- Animal research (only when no alternative)
- Data use (don’t slant evidence to get results you want)

End Section 5 and Chapter 2

HW – p. 47, #2,3 and p.48, I.P.I., U.M.I., #1-4 and T.C., #1
Chapter 2

Videos

The Wonder Pill (Placebo) DVD 234 60 min.