RESEARCH METHODS IN PSYCHOLOGY

I. PHILOSOPHY OF SCIENCE

A. Claims Are Often Made About Human Behavior. Very simple _____ explanations are offered. If you do X, then Y will happen.

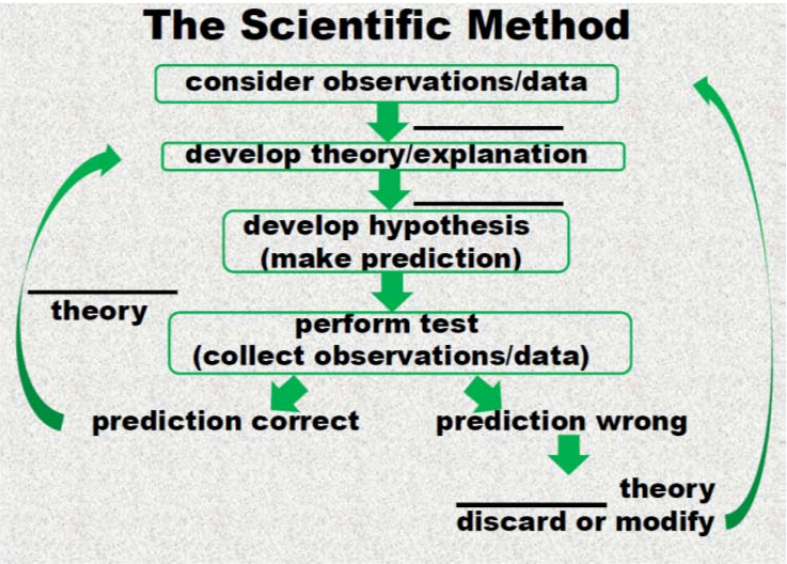
Main point of today's lecture is to help you be a critical consumer of research. Do the _____ support the _____? Practice _____.

B. Two basic assumptions of science:

1. There is a -_____ universe. Our experience is _____ but many aspects reflect input from this physical or _____ world.
2. Events are governed by some _____order.

T or F Scientists are _____. _____ – They lack some knowledge. CARTOON Calvin is ignorant, but is he a scientist? _____ How do they differ?

The scientist uses the _____ _____ to fill in the lack of knowledge—to become _____ "ignorant".



C. The Scientific Method.

Induction is _____;

Can have _____theories for the _____data.

Deduction is understanding what _____ _____if a theory is correct.

The theory _____be wrong, but the method is a _____ _____process!

Notice, scientists do not _____ theories; the test confirms or disconfirms.

The _____ _____ is designed to disconfirm theories that make incorrect predictions.

If a theory cannot be disconfirmed, then _____ goes up, but it cannot be proved.

"No amount of experimentation can ever _____me right; a single experiment can prove me wrong." Einstein

C. There are three rules of science.

1.The only allowable data are _____observations.

Called the principle of public observability — the data must in _____ be observable by anyone.

What about thoughts & feelings? How can they become data? Make them _____.

e.g., a _____ could be defined as agreeing/disagreeing with a statement.

2. All concepts, terms, or phenomena must be _____ defined.
Describe the observations that will define the phenomenon.

3. Only _____ questions are studied; the question can be answered by empirical observation. Not all questions are "solvable" by this definition; not all questions can be addressed by _____.

D. The scientific method requires _____ _____ of empirical variables.

Two main types of systematic observation of variables: _____ and _____

1. In descriptive research, observations of _____ variables.

2. In experimental research, observations are made in at least two situations under the experimenter's _____.

II. DESCRIPTIVE/CORRELATIONAL RESEARCH

A. Surveys: Collect _____ information; describe current situation

RESULTS of our survey (You don't need details, but write general statements.).

Surveys can be used to determine the existence of _____ through correlation.

B. Correlational Research (Determining Relationships); Steps in a correlational study

1. Choose two _____ (variable 1 and variable 2)

2. _____ the variables in a sample

3. Determine if there is a_____ (look at direction and strength).

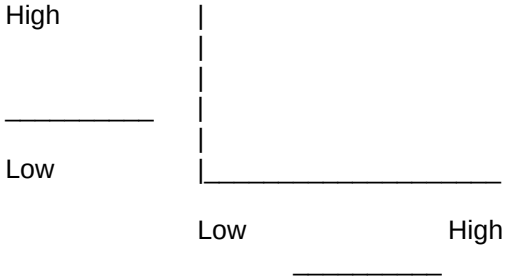
Graph the data and compute correlation coefficient, r

C. USING OUR SURVEY

Choose two variables: _____ and _____.

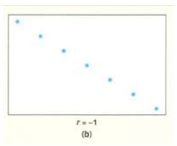
Scatter plots (for continuous variables) - each point represents the values of the two measured variables

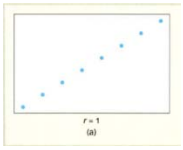
Next compute the correlation coefficient, r.



D. Interpreting Correlational Results

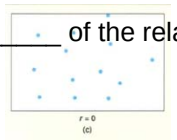
The correlation coefficient, *r*. The range is between _____ and _____.





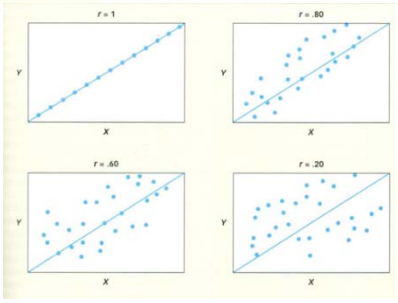
The sign tells the _____ of the relationship (positive or negative).

The value of r tells the _____ of the relationship.



A value of _____ means no relationship.

1.0 = perfect; .7 to .9 = strong; .4-.6 = moderate; .1-.3 = weak



In our survey data, the correlation between the variables was _____.

There was a _____ relationship.

Conclusion—_____

Is this conclusion justified? _____ Why? Correlational studies are only _____.
Cannot infer cause because do not know which is the case:

Changes in variable ____ cause changes in variable _____

Changes in variable ____ cause changes in variable _____

There is a _____variable causing changes in both.

So, with a correlational study, can only conclude that there is a_____ between the variables. Scientists use the following terms with correlational research:

_____, _____, _____.

They do not infer _____ as the media often does.

III. EXPERIMENTAL RESEARCH

A. Three types of variables in an experiment:

1. IV—_____ variable(s) - something the experimenter controls to see if it affects a response.
2. DV—_____ variable(s) - the response (behavior) of interest
3. _____ variables - anything else

B. Logic of the Experiment.

Take two _____ groups. Treat them the same except for one variable (the _____ or treatment). If they behave differently (the_____), then logically the treatment (the IV) _____ have caused the difference in behavior (the DV).

Independent Variable (IV) = treatment Dependent Variable (DV) = behavior

The logic requires that the groups are _____ to begin. How do you make the groups equal? _____ _____ participants to groups – differences will just be due to chance.

_____ samples are better because more likely to be "equal" to begin with.

The logic requires that _____the IV differs between the groups. This is why procedures are _____—to keep conditions constant. If some other variable differs, it is a _____variable (a confound).

If there is a _____, the logic of the experiment does not apply. Why? If there is a confound in the design, then a difference in the _____could be due to a difference in the _____OR in the _____variable. Only well-designed experiments _____ confounds can support conclusions about _____.

Logic of the experiment – if there are no differences between the groups besides the IV (i.e., _____confounds), then differences in the DV _____ be due to differences in the IV.

C. Analyzing the Results: Statistics

How do you determine if the groups are different on the DV? Two step process:

1. _____ statistics--Describe the performance (DV) for the two groups
2. _____ statistics—Decide if the difference is likely due to chance.

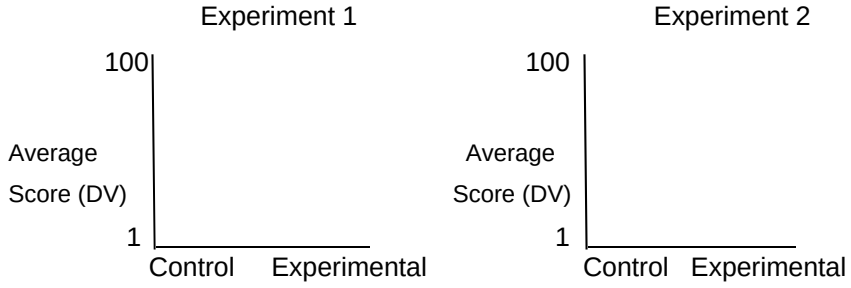
Descriptive Statistics describe the performance of the groups

1. _____: --mean, median, mode
2. _____: range, standard deviation (SD)--larger SD means more variability

9,8,5,2,1

6,5,5,5,4

Group performance on the DV is usually reported in terms of a _____and _____bars based on the SD.



The problem--Is the difference real or due to _____?

Large error bars mean there is a lot of variability in scores within a group (a large _____) – a lot of _____ differences.

_____ statistics compare the difference _____ groups (the effect of the IV) to chance.

If the difference is larger than expected by chance, we say the difference is _____

and conclude that the IV _____ the DV.

Our Experiment Results.

How did we include an experiment within a survey?

What is the hypothesis?

Based on a phenomenon called _____.

What is the IV? It is _____, which was

_____, either _____ or _____.

What is the DV? It is the person's _____, the _____.

What were our results?

Inferential statistics: Is the difference between the groups larger than would be expected by chance?

A t-test (an inferential statistic) says _____. So we conclude that the difference _____

significant and that the _____(IV) affected the _____(DV).

The hypothesis was _____.

Will have a "test" on the ability to distinguish between correlational and experimental research on Thursday.

Syllabus test is due Wednesday night.
Homework 2 is available.