Prelude to Research Designs

- Review of a few things
- Demonstrations vs. Comparisons
- Experimental & Non-Experimental Designs
- "IVs" and "DVs"
- Between Group vs. Within-Group Designs

Reviewing a few things…

Kinds of bivariate research hypotheses (and evidence to support)

Associative research hypothesis

- show a statistical relationship between the variables

Causal research hypothesis

- temporal precedence
- statistical relationship between the variables
- no alternative explanation of the relationship - no confounds

Research Designs

True Experiments

If "well-done," can be used to test causal RH: -- alternative hyp. are ruled out because there are no confounds !!!

True Experiment

- random assignment of individual participants by researcher before IV manip (provides initial equivalence - subject variables - internal validity)
- treatment/manipulation performed by researcher (provides temporal precedence & ongoing equivalence - internal validity)
- good control of procedural variables during task completion & DV measurement (provides ongoing equivalence - internal validity)

Non-Experiments

No version can be used to test causal RH: -- can't rule out alternative hyp. Because there are confounds !!

Quasi-Experiment

- no random assignment of individuals (but perhaps random assignment of intact groups)
- treatment/manipulation performed by researcher
- poor or no control of procedural variables during task, etc.

Natural Groups Design also called Concomitant Measures or Correlational Design

- no random assignment of individuals (already in "IV groups")
- no treatment manipulation performed by researcher (all variables are measured) -- a comparison among participants already in groups
- no control of procedural variables during task, etc.

try these -- focus on determining the "type" of IV and the consequences ...

Version #1 Upon entering the lab, each subject completed a questionnaire that was used to assign them to either the "good mood" or the "poor mood" condition. Each subject then completed a battery of complex concept formation tasks, from which a performance score is determined.

IV ??	Mood	Type ??	measured
DV ??	Cog. Perf.	Causally Interpretable ??	No !!!

Version #2 Upon enter the lab, each subject was approached by a confederate of the researcher who sat next to them and (based upon the results of a coin-flip) either complimented them on her/his dress and appearance or "accidentally" knocked over their books, spilled their drink on the subject, etc. Each subject then completed a battery of complex concept formation tasks, from which a performance score was determined.

IV ??	Mood	Type ??	Manipulated
DV ??	Cog. Perf.	Causally Interpretable ??	Yep !!!

Which of the following are experiments and which are non-experiments?

Each participant from Ms. Smith's or Mr. Jones's class was assigned to the "15 min." or "40 min." practice condition based on a coin flip and then given the appropriate amount of supervised practice with the task before completing the "test".

Exp.
- RA of ind.
- IV manip.

Participants from Ms. Smith's class was assigned to the "15 min." practice condition and those from Mr. Jones's class were assigned to the "40 min." condition. Each participant then given the appropriate amount of supervised practice with the task before completing the "test".

Non-Exp.
- Intact groups
- IV manip.

Participants from Ms. Smith's class was assigned to the "15 min." practice condition and those from Mr. Jones's class were assigned to the "40 min." condition based on a coin flip. Each participant then given the appropriate amount of supervised practice with the task before completing the "test".

Non-Exp.
- RA of intact groups
- IV manip.

Each participant from Ms. Smith's or Mr. Jones's class was asked whether they had studied "more like 15 minutes or more like 40 minutes?"

Non-Exp.
- No RA
- No Manip

Between Groups vs. Within-Groups Designs

Between Groups

- also called Between Subjects or Cross-sectional
- each participant is in one (& only one) of the treatments/conditions
- different groups of participants are in each treatment/condition
- typically used to study "differences" -- when, in application, a participant will usually be in one treatment/condition or another

Within-Groups Designs

- also called Within-Subjects, Repeated Measures, or Longitudinal
- each participant is in all (every one) of the treatment/conditions
- one group of participants, each one in every treatment/condition
- typically used to study "changes" -- when, in application, a participant will usually be moving from one condition to another

Between Groups Design

Experimental Tx	Traditional Tx
Pat	Glen
Sam	Sally
Kim	Kishon
Lou	Phil
Todd	Rae
Bill	Kris

Different participants in each treatment/condition

Within-Groups Design

Experimental Tx	Traditional Tx
Pat	Pat
Sam	Sam
Kim	Kim
Lou	Lou
Todd	Todd
Bill	Bill

All participants in each treatment/condition

Tell whether each uses a **BG** or a **WG** design…

- The study compared the "educational motivation" of males and females. **BG**
- "Psychological well-being" scores collected from participants before and after they experienced a hurricane were compared. **WG**
- Participants were tested after completing 10 practices and again after completing 50 practices **WG**
- Greeks and independents were compared to determine if one was more likely to have voted in the last ASUN election **BG**
- After an initial assessment, patients underwent 6 weeks of treatment and were then reassessed. **WG**
- Patients who had been diagnosed as "depressed" were given either the experimental drug or sugar pills for 6 months then the extent of their depression was reassessed **BG**

Research Designs

Putting this all together -- here's a summary of the four types of designs we'll be working with ...

	True Experiment • w/ "proper" RA/CB - init eqiv • manip of IV by researcher	Non-experiment • no or poor RA/CB • may have IV manip
Between Groups (dif parts. in each IV condition)	Results <u>might</u> be causally interpreted -- if good ongoing equivalence	Results <u>can not</u> be causally interpreted
Within-Groups (each part. in all IV conditions)	Results <u>might</u> be causally interpreted -- if good ongoing equivalence	Results <u>can not</u> be causally interpreted