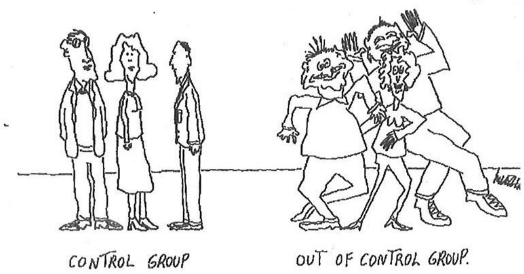


https://hippieprofessor.wordpress.com/2010/09/21/the-out-of-control-group/

> Concepts Variables Designs Variations Issues Etc

Where are we…

	DEADLINES		LECTURE		LABS				
Date	**Things Due**	**Reading (15th)**	**Category**	**TOPIC**	**Lab #**	**Lab Assignment**	**Type**	**T**	**R**
Tue Jan 21		–	Orientation	Orientation	–	–	–	–	–
Thu Jan 23		chapt. 1	Orientation	Inquiry & Research	1	Empirical Claims	Topical	–	1
Tue Jan 28		chapt. 4	Orientation	Research Design	(2)	Mini-Design	Solo	1, (2)	
Thu Jan 30		–	Orientation	SPSS Intro	3	Computing (miles)	Data		(2), 3
Tue Feb 4	HW1 Article Review	chapt. 2	Orientation	Explanation & Theory	4	Writing Hypo	Topical	3, 4	
Thu Feb 6		ch.17 & p.427	Orientation Measurement	Researching Research (guest) Recoding (no lab?)	5	Recoding (colleges)	Data		4, 5
Tue Feb 11		pp. 124-137	Orientation	Conceptualization	(6)	Measuring Love	Solo	5, (6)	
Thu Feb 13	HW2 Annotations	pp. 138-157	Measurement	Operationalization	7	Internal Validity	Topical		(6), 7
Tue Feb 18		pp. 421-426	Measurement	Elementary Stats	8	Univariates (gsssub)	Data	7, 8	
Thu Feb 20		chapt. 3	Orientation	Misuses of Research	EC1	Ethics (extra credit)	Solo		8, EC1
Tue Feb 25	HW3 Dataset Basics	p.415-420, 434-438	Measurement	Quantitative Analysis	9	Coding Heroes	Topical	EC1, 9	
Thu Feb 27		ch.6 & 427-428	Measurement	Indices & Scales	10	Lab (abort)	Data		9, 10
Tue Mar 4		pp. 249-256	Measurement	Surveys: Wording	11	Draft Survey Questions	Topical	10, 11	
Thu Mar 6	HW4 Welfare Analysis	chapt. 7	Measurement	Sampling & Errors	(12)	Apartments	Solo		11, (12)
Tue Mar 11		p.426-427,429-433	Description	Crosstabs	13	Crosstabs (gss84)	Data	(12), 13	
Thu Mar 13	MIDTERM	–		Project Overview (mandatory lecture)	–		–		13
Tue Mar 18				(Spring Break)					
Thu Mar 20				(Spring Break)					
Tue Mar 25	HW5 Indices	pp. 256-263	Measurement	Surveys: Format	14	Draft Survey Format	Topical	14	
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
Tue Apr 1		chapt. 8	Observation	**Experimental Research**	16	**Review Survey Draft**	Topical	15, 16	
[illegible]	[illegible]	–	Description	[illegible]	17	[illegible]	Data		[illegible]
Tue Apr 8		pp. 263-288	Observation	**Surveys: Mode**	(18)	**Conduct Survey**	Solo	17, (18)	
Thu Apr 10		pp. 433-434	Description	**Multivariate & Modeling**	19	**Multiple R (multireg)**	Data		(18), 19
Tue Apr 15	**HW7 Three Tests**	ch.13 & 428-429	Orientation	**Qualitative Analysis**	(20)	**Jaywalking Study**	Solo	19, (20)	
Thu Apr 17		pp. 420-421	Observation	**Data Entry**	(21)	**Data Entry**	Solo		(20), (21)
Tue Apr 22		chapt. 10	Observation	**Fieldwork & Ethnography**	(22)	**Grounded Theory**	Solo	(21), (22)	
Thu Apr 24	**HW8 Experiment**	chapt. 15	Description	**Control Variables & Elab**	EC2	**Elaboration (extra credit)**	Data		(22), EC2
Tue Apr 29		chapt. 11	Observation	**Unobtrusive Research**	23	**Content Analysis**	Topical	EC2, 23	
Thu May 1	**HW9 Survey Analysis**	pp. 316-318	Observation	**Focus Groups**	24	**Evaluation Design**	Topical		23, 24
Tue May 6		chapt. 12	Description	**Oral Presentations**	(25)	**Oral Presentations Eval**	Solo	24, (25)	(25)
Thu May 8									
Thu May 15	**Final Exam**			**(no class meeting - due 5pm, firm!)**				-	-

Your last Halloween costume

- 5% A. Celebrity
- 38% B. Character
- 0% C. Concept
- 8% D. Monster
- 3% E. Object
- 18% F. Other
- 30% G. No costume

30

> Concepts Variables Designs Variations Issues Etc

Outline for Today

- Concepts
  - Measurement, Testing & Time
- Variables
  - Control, Allocation, & Randomization
- Design
  - Classical, & Variations
- Issues
  - Weaknesses & Strengths
- Etc.
  - HWs, Project, & Lab

SOC497/L: SOCIOLOGY RESEARCH METHODS

Experimental Research:

Methodological Controls

Ellis Godard

> Concepts Variables Designs Variations Issues Etc

The Basic Idea…

- Take action and observe the results
  - Vary the nature of something within a sample
  - Look for differences that follow
- Same major components as all* research:
  - Measurement Variation
  - Times of Observation
  - Experimental Control

* vary, of course (as everything does) – in degree, style, focus, etc.

Measurement Variation

- Independent
  - experimental stimulus or treatment
    - Aka "cause", "exogenous variable"
  - Usually dichotomous
    - 2 attributes: either present or absent
- Dependent
  - experimental outcome or simply a *change* in some dependent variable
    - Aka "effect", "endogenous variable"

Times of Observation

- Two times:
  - Pretest: Measured before the stimulus/treatment
  - Post-test: Measured (again) after the stimulus/treatment
- Example & Reasoning
  - Subjects are measured, exposed to stimulus, & measured again
    - E.g. questionnaire, show a film, and questionnaire again
    - difference between tests is attributed to stimulus (IV)
- Both in classic design – but not others!

1. The dependent variable…

A. All of the below
0%

B. Is the outcome
100%

C. Is the stimulus
0%

D. Is the treatment
0%

E. Is usually dichotomous
0%

Experimental Control

- Experimental group
  - group to which stimulus is (or has been) applied
- Control group
  - does not receive or experience the experimental stimulus
  - allows researcher to detect effects of the experiment itself
- Testing Times
  - look for the difference between pretest and posttest to vary
    - higher (or lower?) for the experimental group
  - sometimes use more than one experimental or control group
- Placebo
  - Validity problem w/ pretest b/c respondents observe the measurement
  - Ergo, esp. in medical research, give a placebo (sugar pill, "Obecalp")

Experimental Testing

- Compares what happens when the stimulus is present to what happens when it is not by looking for changes in the dependent variable
- Like any statistical test of a relationship
  - *Logically* – a relationship is when the value of the dependent variable is different if the value of the independent variable is different
  - *Practically* – Any variable might serve as an independent in one experiment and as a dependent in another
  - *Methodologically* – must operationally define how to measure things (eg questionnaire) and must be clear about what you look at in order to measure

2. Which provide(s) experimental control?

A. Placebo
2%

B. Control group
0%

C. Pretest/Post-test
0%

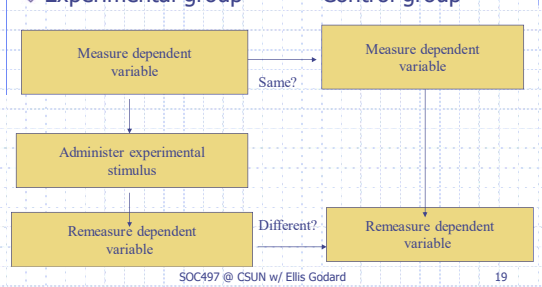
D. All of the above
98%

E. None of the above
0%

Randomization Important

- Should randomly assign subjects to the experimental & control groups
  - Reduces the chances that one group is different from another in important ways
  - Gives greater confidence that the subjects in one group will be reasonably similar to those in the other group – want comparable groups
  - The bigger the sample (the more subjects), the more confidence we have in our results

Classic Design (Pretest *and* Control)



Remember External Validity?

- **How generalizable are the results?**
  - Controls & Randomizations key
  - less of a problem with explanatory than descriptive
  - patterns are more generalizable and stable than specific characteristics
- **Probability sampling not often used**
  - Requires large sample size to be confident in representativeness
  - May need 100+ per group - but experiments often have ~40 *total*
- **Split sample**
  - 40 may not represent population, but can randomly assign each to 2 groups
  - sampling logic suggests that each group of 20 represents the "population" of 40
- **Matching is even better** (…)
  - look for pairs of similar subjects and put one in each group
  - esp strong if use quota matrix - see figure 9-2 on p.239
    - but remember that key is not random vars (age, race, etc)
    - just those that you believe will be strongly related to the DV (and/or IV)
  - Also, have to know what variables are important in advance

Pre-Experimental Variations

- One-shot case study
  - one group gets the stimulus
  - Apply the independent variation, and measure the results
- One-group pretest-posttest (aka pre-post) design
  - adds pretest but no control group
    - observe d/v, apply I/v, measure before/after
  - nothing to measure the effect of the I/v against
- Static-group comparison
  - stimulus for one group, compared to control
  - But no pretest, so no "baseline" to compare differences
- Solomon 4-Group Comparison

Stratified Allocation

	Men		Women	
	African American	White	African American	White
Under 30 years	8	12	10	16
30 to 50 years	18	30	14	28
Over 50 years	12	20	12	22

Experimental group ← *half in each* → Control group

6 7 6 7

Solomon four group design

Group one		
pretest	stimulus	posttest
Group two		
pretest		posttest
Group three		
	stimulus	posttest
Group four		
		posttest

Solomon 4-Group Design

- Combines static-group comparison w classic experiment to render more complex argument about differences observed
- Campbell & Solomon argue that you only need groups 3 & 4
  - posttest-only control group design (static-group comparison) sufficient
  - Often, the only reason to pretest is tradition
    - but this true only if randomized groups

Natural Experiments

- Example: Disaster research
- Qualities:
  - Opportunistic
  - Quasi experimental
  - Ex post facto
  - Outside of controlled environments
- Examples
  - Three Mile Island nuclear power plant accident.
  - "Roots" television study, before and after study.

3. Which design provides the weakest evidence for a claim?

A. Classic experimental design
0%

B. One group pretest/post-test design
2%

C. One-shot case study
98%

D. Solomon 4-group design
0%

E. Static-group comparison
0%

Crucial/Critical Experiment

- Confirms or falsifies an idea (esp. an entire theory) in a single experimental test
- Could be any design or type of experiment
- Often a focus in "hard"/physical sciences
  - May be envisioned for decades in advance
  - Sometimes, contention about whether *possible*

Other Design Variations

- Confederate (p 134)
  - pretends to be a participant to facilitate the experiment
- Double Blind
  - Measurement and allocation are separate
    - Measurement taker and group assigner are different researchers, may not even know each other
    - experimenter does not know which group is which.
  - Guards against experimenters who may prejudice results.
- Dual Stimuli
  - E.g. ties vs. hawaiian shirt
- Focus groups
  - Guided discussion, group in-depth interview

Sources of *Internal* Invaldity

- Barriers to valid measures (12 @ p. 230; from Campbell, Cook, & Stanley; 8 dimp)
  - **Selection bias** – try to make the groups comparable as possible
  - **Sensitization** – use controls and placebos to minimize risks/effects
    - Example: Rosenthal & Jacobson (1968) on student performance
      - Teachers told certain students they would will grow faster (intellectually – one year later they "did")
      - Attribution process / Expectations communications process
  - **Diffusion** (a.k.a. contamination) if experimental & control groups not separated
  - **Compensation** – researchers treat control group differently
    - so need double-blind, placebos, and clear measurements
  - **Demoralization** – control group may feel left out or deprived
    - Need to explicitly balance attention to reduce risks/effects
  - **Maturation** – people constantly grow and change
  - **History** – historical events may occur during the experiment
  - **Experimental mortality** – some folks leave the design

Other Disadvantages

- Artificiality
  - Harvard Test of Inflected Affiliation
    - Tested students, gave results to teachers, returned @ 1 year
    - Progress made by "spurters" due to getting more attention
- May lack statistical precision
  - IV may be easy (dichotomous)
  - DV may be amorphous
    - What *are* the outcomes?
    - More in evaluation lecture…
- Ethics
  - See earlier lecture

When to Experiment?

- Ideal for testing hypotheses
  - Well suited for limited and well-defined concepts and propositions
  - establishes a time order and looks to see if followed
- Better for explanatory than descriptive purposes
  - Because they focus on determining causation
    - though one e.g of descriptive use
  - But exploratory, too – e.g. homework 7
- Esp. good to study small group interaction
- Used in nonscientific inquiry as well
  - how much of the text do I have to read to pass?

Practical Consequences

- Experiments not often done in sociology
  - often done in psychology
    - perhaps because measuring individual reactions (vs. soc relationships?
    - tho can still be harmful - eg milgram
- Instead, sociologists typically do 1 of 2 things
  - Multivariate causal arguments
    - systematic comparisons, e.g. with crosstabs
    - Test dual hypotheses, especially thru elaboration
    - Durk calls this "indirect experimentation"
  - Quasi-experimentation
    - Same idea, often w/ indices or conceptual variables

4. Which is *not* an advantage of experiments?

A. Isolation of the IV

B. Logical rigor

C. Relatively cheap

D. Replication easy

E. Statistical accuracy

Methodological Advantages

- Isolation of the IV and its impact over time
- Logical rigor hard to achieve w/ other modes
- Relatively little money, time, and subjects
- Relatively simple to replicate

HW – See handout!

- No Experimental Lab – "Just" a HW
- Read instructions carefully
  - Pick outcome – be clear!
  - Pick stimulus – ***clear it with me***!
  - Pick location – plan ahead!
  - 30 minutes
    - 10 on, 15 off, 5 on
- Write two-page report
- Note schedule: No experiment *lab*

Lab Continuity Notes

- Last time you formatted revised questions
- Now, you'll review a complete survey
  - All submitted Qs added to same doc, mostly "as is"
    - All in, so some repetition
    - Numbered, but not ordered
    - Q vs Response, but no contingencies yet
  - Look at *entire* survey for *all* errors – NOT just yours
    - esp. question wording and formatting
    - Omissions, additions, etc.
    - Spelling, grammar, margins, *everything*

5. How many backgrounds did I use today?

1. 1
   0%
2. 2
   0%
3. 3
   2%
4. 4
   98%
5. 5
   0%

:00

Reminder Warning RE Extras

- There's a real cost to every Q in any research project
- There's a grade penalty on your SEMESTER GRADE for any question(s) you add but don't end up using
  - See p. 3 of the syllabus:

    Note that any question that put on the survey but do not ultimately use may result in a grade penalty on your *semester* grade. This is to reflect the reality that survey questions are costly, both financially and in terms of other resources. Every extra question on our survey wastes respondents' as well as students' time. The first unused question will result in a 0.5% penalty, the second in an additional 1% penalty, the third 2%, and so on, doubling for each additional question. Four unused questions, for example, will result in a combined 7.5% penalty, on your semester grade.
  - 6 questions would be 0.5+1+2+4+8+16+32 = 31.5% *penalty*
  - That's a *penalty* on your *semester* grade, from a 100-pt scale!! ☹
  - You need TWO QUESTIONS, not 6 or 8 or 10!!

Team Scores

Points	Team	Points	Team
3	Celebrity		
3	Character		
3	Monster		
3	Object		
3	Other		

Lab Exercise

- **First** (but *NOT* only) **focus on your contributions**
  - Are all your needs met – draft Qs? DV? IV? Demographics?
  - If not, submit any additions / corrections
- **Second, review questions for *other* groups**
  - Satisfy the wording and format guidelines provided?
  - For similar questions, which should we use?
  - Is the question order ok, or problematic?
- **You can ignore:**
  - Question #s & # to skip to – that will be automated
- **Submission**
  - Mark corrections, suggestions, additions, etc. – ALL of it ☺