- **Last Lecture:**

- Looked at ***Research Orientations***:
  - Positivism vs. Interpretivism
  - Objectivism vs. Constructionism
  - Qualitative vs. Quantitative
  - Nomothetic vs. Ideographic research designs

- Looked at ***criteria for evaluating social research:***
  - Reliability, Validity, Replicability
  - Credibility, transferability, dependability, confirmability

This Lecture:

- 1.) Go over some of last week's missed lecture (posted fully on owl):
  - Look at ***4 basic research designs***
    - Experiment, case study, cross-sectional, longitudinal
  - Move onto Chapter 3: The nature of quantitative research:

    1. The **4 main goals** of quantitative research
    2. The **11 basic steps** to doing quantitative research
    3. Measurement and operationalization (Step 4)
    4. Checking for reliability and validity in measurement (Step 9)
    5. Some criticism of quantitative research

- 2.) Get through as much of this week's scheduled lecture as we can (lecture extras only of whatever we get through):
  - Move onto Chapter 4: Survey Research
    - Concept of Standardization
    - Reducing interviewer error and non-response
    - Look at types of survey research
      - Structured interviews (face to face or phone)
      - Self-Administered Questionnaires
      - Researcher Driven Diaries

Experiments

- The traditional means of 'doing' science
  - Quantitative only

- Rare in sociology (more common in psych) because:
  - Many variables of interest are *not subject to* ***experimental manipulation***
    - ex. gender, age, ethnicity, income etc.
  - ***Ethical concerns*** preclude performing experiments
  - Many phenomena of interest have long-term, complex causes that cannot be simulated in experiments

Experiments

- Key concepts:
  - ***Experimental*** or ***treatment*** group: receives a treatment or manipulation of some kind
  - ***Control group***: does not get the treatment or manipulation
  - ***Random assignment***: participants are placed in the experimental or control group using a random method
  - ***Pre-test***: measurement of the dependent variable before the experimental manipulation
  - ***Post-test***: measurement of the dependent variable after the experimental manipulation

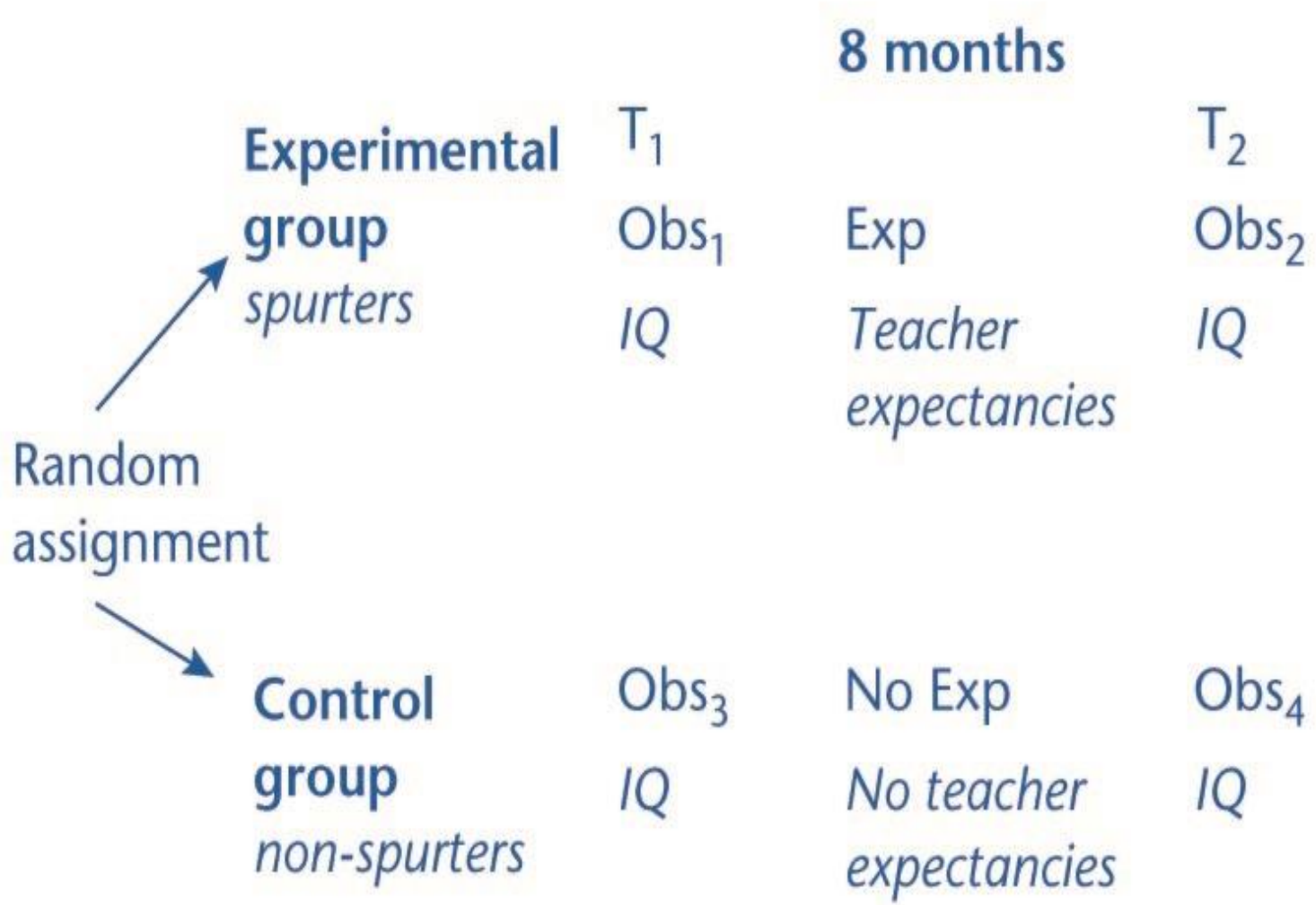

Figure 2.1 Classical experimental design

Experiments

- **Two kinds of experiments*:***
  - ***Laboratory experiments***: take place in artificial environments
    - Milgrim experiments
  - ***Field experiments***: are conducted in real-life surroundings
    - Rosenthal and Jacobson ‘Spurters’ experiment

Experiments

- Normally *very high in* ***internal validity*** (best possible method)

- Threats to internal validity that are *always possible*:
  - ***Mortality (Attrition)*****:** participants leave the experiment before it is over
  - ***Maturation*****:** participants change over time
    - get older, develop mentally and emotionally, etc.

Quasi Experiments

- Missing some element of a true experiment
  - Ex. no control, no random assignment
  - ***internal validity*** is harder to establish

- Many kinds (your text highlights one):

  - ***Natural experiments:*** naturally occurring phenomena or changes introduced by people who are not researchers result in experiment-like conditions.

  - Ex. Alberta and Saskatchewan in the 30s and 40s

Experiments

- Threats to ***internal validity*** that are worse if no control, or no random assignment :
  - ***History***: some event occurring after the treatment was given may have influenced the dependent variable
  - ***Testing***: the pre-test may have influenced the dependent variable
  - ***Instrumentation***: changes in the way a test is administered may account for pre-test and post-test differences
  - ***Selection*****:** post-test differences between the control and experimental groups may have been caused by pre-existing differences
    - N.B. applies to most ***Quasi Experiments***

Experiments

- Threats to ***external validity***:
  - ***Interaction of selection and treatment:*** the findings may not be applicable to the *kinds* of people who were not in the experiment
  - ***Interaction of setting and treatment:*** the findings may not apply to settings and environments that differ from those of the experiment
  - ***Interaction of history and treatment:*** the findings may not apply to other time periods, either in the past or in the future
  - ***Interaction effect of pretesting:*** the findings may not apply to people who were not pretested, and few people in society are pre-tested
  - ***Reactive effects of experimental arrangements:*** the findings may be invalid because they were caused by subjects behaving atypically due to the fact that they were in an experimental situation

Ethical Issues

- Often discussed in the context of experiments, but also applicable to different research designs

- A few prominent issues:
  - Deception of participants vs. informed consent
  - The conditions of the experiment cause Psychological/physical harm
  - Related: Debriefing causes psychological harm
  - Confidentiality and Anonymity
  - Fair Payment, Bribery and Taking Advantage
  - So how much harm is harm?
    - Who decides?
      - In Canada, and in many other countries - Institutional ethics committees

Case Study Design

- A basic case study involves an *in-depth study of a single case.*
  - Can be a person, family, organization, event, etc.
  - Examples:
    - Oscar Lewis '*The Culture of Poverty*' (Sanchez family: Mexico)
    - Rinehart '*The Tyranny of Work*' (Auto Factory)
    - White '*Street Corner Society*' (Italian immigrant community)
- ***External validity*** usually very low
  - Not really the point of this type of research
- Almost always qualitative
- Often longitudinal

Case Study Designs

- Types of case:
  - ***Critical:*** illustrates the conditions under which a certain hypothesis holds or does not hold
    - Should have higher external validity
    - Closer to quantitative approach
  - ***Extreme*** (or ***unique***): illustrates unusual cases, which help in understanding the more common ones
    - No external validity – meant to contrast the common
      - Ex. Margaret Mead's Growing up in Samoa
  - ***Revelatory***: examines a case or context never before studied, and previously inaccessible to study
    - Wikileaks has provided material for much revelatory research!

Cross-Sectional Designs

- Observations made at only *one point in time*
- Not experiment
  - *No manipulation* of the independent variable (no 'treatment' is given)
- Instead, two or more variables are measured in order to detect *patterns of association*
  - Examples: structured interviews, structured observation

Cross-Sectional Designs

Obs_1	Obs_2	Obs_3	Obs_4	. . .	Obs_n
$Case_1$					
$Case_2$					
$Case_3$					
$Case_4$					
$Case_5$					
. . .					
$Case_n$					

Figure 2.2 The data rectangle in cross-sectional research

Cross-Sectional Designs

Case	Age	Married?	How often do you consume 5+ drinks at once	Depression Scale score
1	25	Y	Every day	48
2	76	N	Every day	35
3	34	Y	About once per week	21
4	23	Y	About once per month	14
5	21	N	Never	46
6	56	N	About once per week	42
7	61	Y	A few times per year	23
…	44	Y	Every day	31
100	19	N	Never	33

Cross-Sectional Designs

- Can be used to examine the effect of variables that cannot be manipulated in experiments
  - Ex. age, gender, ethnicity, culture, social class, etc.

- Example in text: Obesity and social stigma
- Another example: Alcohol consumption and depression

Cross-Sectional Designs

- Often *weak in* ***internal validity***
  - Ex. Alcohol consumption and depression are found to be associated (correlated) but …
    - Which is dependent and which is independent?
      - Does alcohol consumption cause depression or does depression cause alcohol consumption?
    - Is there ***reciprocal causation*** involved?
      - i.e. Is it both?

- We measured them both at the same time, so **What is the temporal order here?**

Cross-Sectional Designs

- Tend to be high in ***external validity*** provided:
  - Proper sampling procedures used
    - random method is used to select participants for the study
    - Also a large enough number of participants should be involved
- Also *strongly* ***replicable***

Longitudinal Designs

- Two basic types:
- ***Panel study***:
  - Cases are examined at a particular time (T1), and again at a later time or times (T2, T3, etc.)
  - Ex. National Longitudinal Survey of Children and Youth (NLSCY)
    - Large sample of children aged 0-11 years old in 1994
    - Exact children found again in 1996, 1998, 2000, 2002, 2004, 2006, 2008
- ***Time series analysis (cohort study)***:
  - *different* people are studied at each time
    - Sample 1 (S1) at T1, S2 at T2, S3 at T3
  - Ex. 'Canadian Labour Force Survey' (LFS) new random sample of Canadians each month

Longitudinal Designs

Case	Age	Married?	How often do you consume 5+ drinks at once	Depression Scale score
1 (T1)	25	Y	Every day	48
1 (T2)	26	Y	About once per week	33
1 (T3)	27	Y	About once per week	20
2 (T1)	76	N	Every day	35
2 (T2)	77	N	Every day	37
2 (T3)	78	N	Every day	42
3 (T1)	34	Y	About once per week	21
3 (T2)	35	N	About once per month	19
3 (T3)	36	N	A few times per year	14

Longitudinal Designs

- provide information about the *time-order* of changes in certain variables
  - potentially *very high* ***internal validity***

- Drawbacks of panel studies:
  - Attrition over time (people dropping out)
  - Extremely $$$ and often very time consuming
  - Difficult to do well
  - Panel conditioning: people's attitudes and behaviours may change as a result of participating in a panel

Moving on to chapter 3: The Nature of Quantitative Research

1. The **4 main goals** of quantitative research

2. The **11 basic steps** to doing quantitative research

    3. Measurement and ***operationalization*** (Step 4)

    4. Checking for ***reliability*** and ***validity*** in measurement (Step 9)

5. Some criticism of quantitative research

Main Goals

1. *Systematic Measurement* of social phenomenon:

- Need good measures/measurement for <u>all</u> quantitative methods
  - Must *know* what we are looking at – detailed description is key
  - Clarity in *definition of our concepts* very important
    - Measures/*Indicators* need to meet criteria of ***validity*** and ***reliability***

Main Goals

2. Establishing causality: researchers want to know what *causes* social phenomena

- Cross sectional research – often *infer* cause
- Experimental and Longitudinal research can get to 'temporal order'

Main Goals

- ***3. Generalization*** of findings to those not studied
  - Preferably make generalizations that apply to the whole population from whom the sample was taken
  - In other words
    - high external validity
    - Nomothetic explanations
  - Having a representative sample is essential for this

Main Goals

- ***4. Replication***: repeating a study using the same methods
  - provides a check for biases and routine errors
    - If the findings are not the same as those of the original study, the findings of the original are brought into question
    - If the same, researchers have greater confidence in the original findings.

Only 11 Basic Steps …

Figure 3.1 The process of quantitative research

Steps 1, 2, 3

- **Step 1: Theory**
  - Start at the Library:
    - Review past research and theoretical arguments
    - Can do keyword search on whole databases
      - ex. ‘sociological abstracts’ or ‘social sciences citation index’

- **Step 2: Develop a hypothesis/research question**
  - Discussed in chapter 1
- **Step 3: Choose a research design**
  - Discussed in chapter 2

Step 4

- **Step 4: Devise Measures of Concepts**
  - ***Concept***: ideas or mental representations of reality that serve as the basic building blocks of theory
    - Ex. 'crime', 'political orientation' 'life expectancy', 'life satisfaction', 'depression', etc.
    - Concepts may be independent or dependent variables

- Concepts can be defined in 2 different ways:
  - ***Nominal definition***: describes the concept in words, much like a dictionary definition
    - Ex. 'political orientation' refers to the party to which people most closely associate themselves
  - ***Operational definition***: describes how the concept is to be measured
    - Ex. 'political orientation' may be measured by asking people, "Do you normally think of yourself as a supporter of the Conservatives, Liberals, New Democrats, Greens, Bloc Québécois or other?"

Step 4

- ***Operationalization:*** Move from the conceptual level (nominal def) to direct observation (operational def)
  - Ex. 'depression':
  - ***nominal definition***: a mental state characterized by a pessimistic sense of inadequacy and a despondent lack of activity ….
  - Can be ***operationalized*** via a set of survey questions designed to measure symptoms
    - Have you over the past week:
      - "felt depressed"
      - " felt everything was an effort"
      - "lost interest in activities that you previously enjoyed"
      - "trouble sleeping" ….etc.
    - Add up the yeses and decide on a cutoff point for depression, say 5/10

Step 4

- Some concepts are straight forward to ***operationalize***:
  - Ex. Age, Sex, Family income

- Other concepts are more abstract and difficult
  - Ex ‘happiness’, ‘job satisfaction’ ‘depression’, ‘SES’

- Often use more than one indicator with abstract concepts because using only one indicator:

  - May *misclassify* some people
    - Ex. certain indicators of depression also apply to other disorders

  - May not *capture all the meaning* of the underlying concept
    - Ex. using only income to classify SES

  - May not allow the researcher to *make fine distinctions*
    - Ex. Using only 1 indicator for health

Step 4

- N.B. For abstract concepts, indicators are often created using ***Likert scales***
- These scales are also used for building one indicator out of many
  - Back to depression example
    - Have you over the past week:
      - "felt depressed"
      - " felt everything was an effort"
      - "lost interest in activities that you previously enjoyed"
      - "trouble sleeping" ….etc.
  - Rather than each just being yes/no, instead rank each on a 5 point scale (5 4 3 2 1 in this case) – when we add them, we get a scale out of 50 instead of 10

Always Almost always Some of the time Almost none of the time None of the time

Step 4

Examples of the sorts of indicators that are available in quantitative research:

- 1. Specific questions
  - Ex. ***structured interviews***, ***self administered questionnaires***, etc.

- 2. ***Systematic and structured observations***
  - Ex. pre-schoolers in a classroom setting
    - document gender & frequency of aggressive behavior

- 3. Rely on official statistics and other data already collected for other purposes (***secondary analysis***)
  - ***Vital statistics*** like births, deaths, marriages,
  - ***Surveys*** like the NLSCY or LFS

- 4. Collect data through the indicators that classify "written or symbolic material" (***content analysis***)

Steps 5, 6

- **Step 5: Select research site(s)**

- **Step 6: Select research subjects/respondents**
  - Sampling (chapter 12) included here

- Steps 5 and 6 are subject very much to politics and practical considerations

Step 7

- **Step 7: Administer research instruments/collect data**
  - ***Experiments:*** pre-test, manipulate treatment group, post-test
  - ***Structured interviews and questionnaires:*** Provide interview schedule and conduct interviews or provide questionnaire and collect when complete
  - ***Structured observation:*** Watch setting and record info
  - ***Secondary Data:*** apply for access to data, pay for it, get it from the public realm

Step 8

- **Step 8: Process Data**
  - In quantitative research:
    - our operational definition must allow for the ***coding*** of responses for eventual analysis

- ***Coding***: transforming a measure into numbers
  - Ex. 'Political orientation'
  - (1) Conservative
  - (2) Liberal
  - (3) New Democrat … etc.

- N.B. we do this even when the numbers don't mean anything in this context

Step 8 con't: Coding

Case	Age	Married?	How often do you consume 5+ drinks at once	Depression Scale score
1	25	Y	Every day	48
2	76	N	Every day	35
3	34	Y	About once per week	21
4	23	Y	About once per month	14
5	21	N	Never	46
6	56	N	About once per week	42
7	61	Y	A few times per year	23
…	44	Y	Every day	31
100	19	N	Never	33

Case	Age	Married?	How often do you consume 5+ drinks at once	Depression Scale score
1	25	1	1	48
2	76	2	1	35
3	34	1	2	21
4	23	1	3	14
5	21	2	5	46
6	56	2	2	42
7	61	1	4	23
…	44	1	1	31
100	19	2	5	33

nlscy1994.sav [DataSet1] - SPSS Data Editor

File Edit View Data Transform Analyze Graphs Utilities Window Help

1 : agehd03 | 24 | Visible: 745 of 745 Varia

	agehd03	ammpq02	ammsq02	ammcq01	ammcq02	admhd02	admcd03	admcd04	admcd05	admcd06	admpd06a	admcd06b	admcd06c	ac
1	24	M	F	4	F	3	11	1	1	21	1	11	3	
2	24	F	6	7	F	2	51	2	2	11	2	50	3	
3	24	F	6	3	M	3	51	2	2	11	2	50	3	
4	24	F	6	7	F	3	51	2	2	11	2	50	3	
5	24	F	6	11	M	2	51	2	2	11	2	50	3	
6	24	F	6	10	M	3	51	2	2	11	2	50	3	
7	24	F	6	11	M	3	51	2	2	11	2	50	3	
8	24	F	6	5	F	3	51	2	2	11	2	50	3	
9	24	F	6	6	F	3	51	2	2	11	2	50	3	
10	24	F	6	8	F	2	51	2	2	11	2	50	3	
11	24	F	6	2	F	2	51	2	2	11	2	50	3	
12	24	F	6	3	M	3	51	2	2	11	2	50	3	
13	24	F	6	0	M	2	51	2	2	11	2	50	3	
14	24	F	6	2	F	2	51	2	2	11	2	50	3	
15	24	F	6	5	M	2	51	2	2	11	2	50	3	
16	24	F	6	4	F	2	51	2	2	11	2	50	3	
17	24	F	6	1	F	2	71	2	3	13	2	50	3	
18	24	F	6	8	F	3	51	2	2	11	2	50	3	
19	24	F	6	11	F	2	51	2	2	11	2	50	3	
20	24	F	M	3	M	3	11	1	1	11	1	21	3	
21	24	F	6	5	M	2	51	2	2	11	2	50	3	
22	24	F	6	11	M	2	51	2	2	11	2	50	3	
23	24	F	6	4	M	2	51	2	2	11	2	50	3	
24	24	F	6	2	M	2	51	2	2	11	2	50	3	
25	24	F	6	1	M	2	51	2	2	11	2	50	3	
26	24	F	M	6	F	3	11	1	1	11	1	21	3	
27	24	F	6	10	M	4	51	2	2	11	2	50	3	
28	24	F	6	5	F	2	51	2	2	11	2	50	3	
29	24	F	6	7	M	2	51	2	2	11	2	50	3	
30	24	F	6	3	F	2	51	2	2	11	2	50	3	

Data View | Variable View

SPSS Processor is ready

Start | SPSS Data | nlscy1994.sav [DataS... | Output1 [Document1] - ... | Syntax1 - SPSS Syntax E...

Step 9

- **Step 9: Analysis**
  - Big step! Covered in some detail later in this course and much in SOC2205
    - Choose statistical techniques and test relationships between variables
    - check for ***validity*** and ***reliability*** issues
      - Moving onto some of these now

Step 9

- ***Reliability*** always concerned with the *consistency* of measures of a concept, yet several definitions:

1. ***Stability over time***:
   - Consistency in a *single measure over time* (assuming no change in what is being measured)
     - The bathroom scale example from last week

2. ***Internal reliability***:
   - Consistency in measurement when using *multiple indicators* to measure the same concept *at a single point in time*
   - How to test?
     - Cronbach's alpha coefficent > .80
     - Split-half method

3. ***Inter-observer reliability:***
   - Consistency in measurement across researchers
     - Ex. coding open ended questions in a questionnaire or coding in content analysis

Step 9

- There are various kinds of ***measurement validity***:
  - ***Face validity***: Does the measure appear 'on the face of it' to be valid?
    - Sort of about common sense
    - Do other researchers agree?
    - Much easier to establish with more straight forward concepts..
  - ***Concurrent validity:*** does the measure correlate to another measure that is also relevant to the concept?
    - Ex. research on 'job satisfaction'
      - Ask people to rate how satisfied they are with their jobs (our measure)
      - Find a measure related to job satisfaction – maybe absenteeism
      - Do workers who score low on absenteeism score high on job satisfaction?
      - If yes, concurrent validity!

Step 9

- ***Construct validity:*** concepts relate to each other in a way that is consistent with the researcher's theory
  - Ex. theory states that child 'hyperactivity' is caused by 'poor parenting'
    - we see that 'hyperactivity' increases as parenting 'gets worse'
    - We thus suggest that the measures used to gauge 'poor parenting' and 'hyperactivity' are valid

- N.B. Must be very careful with this!!!
  - It might not be non-valid measures, it might be real differences between theory and observation!

Step 9

- ***Convergent validity:*** a measure of a concept correlates with a second measure of the same concept that uses a different measurement technique

- Ex. Statistics Canada
  - survey based measures of income (*asks* respondents how much they make)
  - information from Revenue Canada on income
    - If averages are close, measures are considered valid

Steps 10, 11

- **Step 10: Findings/conclusions**
  - Is your research question answered or your hypothesis supported?
  - Are there implications for theory, for social life or social policy?

- **Step 11: Write-up findings/conclusions**
  - Publish it and let others judge the quality/usefulness of your work, potentially replicate it etc.

Critique of Quantitative Methods

- Critique: Humans and their actions are fundamentally different from what is studied in the natural sciences – we shouldn't be studying them in the same way

- Counter: Humans are a (very complex, unique) part of nature - science can, and should be used to understand the human condition
  - Including consciousness, emotions, meaning etc.

Critique of Quantitative Methods

- The measurement process produces an artificial and false sense of precision and accuracy
  - Ex. problems can arise if people interpret the same survey item differently
    - How is your general health?
      - Excellent
      - Very good
      - Good
      - Fair
      - Poor
  - What do these categories mean to each person? How do they judge their own health?

Critique of Quantitative Methods

- Quantitative research produces a disjuncture between research and everyday life
  - A problem of external validity
    - Everyday life is more complex than we make it in experiments
    - We assume survey respondents have both knowledge and interest to answer the questions in a ‘common’ way

Critique of Quantitative Methods

- Critique: An analysis of relationships between variables ignores people's everyday experiences and how they are interpreted

- Counter: Some of the relationships we study include meaning and interpretation

Critique of Quantitative Methods

- Critique: tend to assume an objectivist ontology
  - a social reality exists that is independent of the observer
  - the social order is fixed rather than negotiated

- Counter: some of the social order *does* exist outside of our perceptions of them
  - N.B. soft constructionist argument

Reality and practice

- The ideals of quantitative research and how it is actually conducted may be very different
- less attention may be paid to matters of reliability and validity than what one might think
- Some of that comes about through practical limitations of time, cost, and feasibility