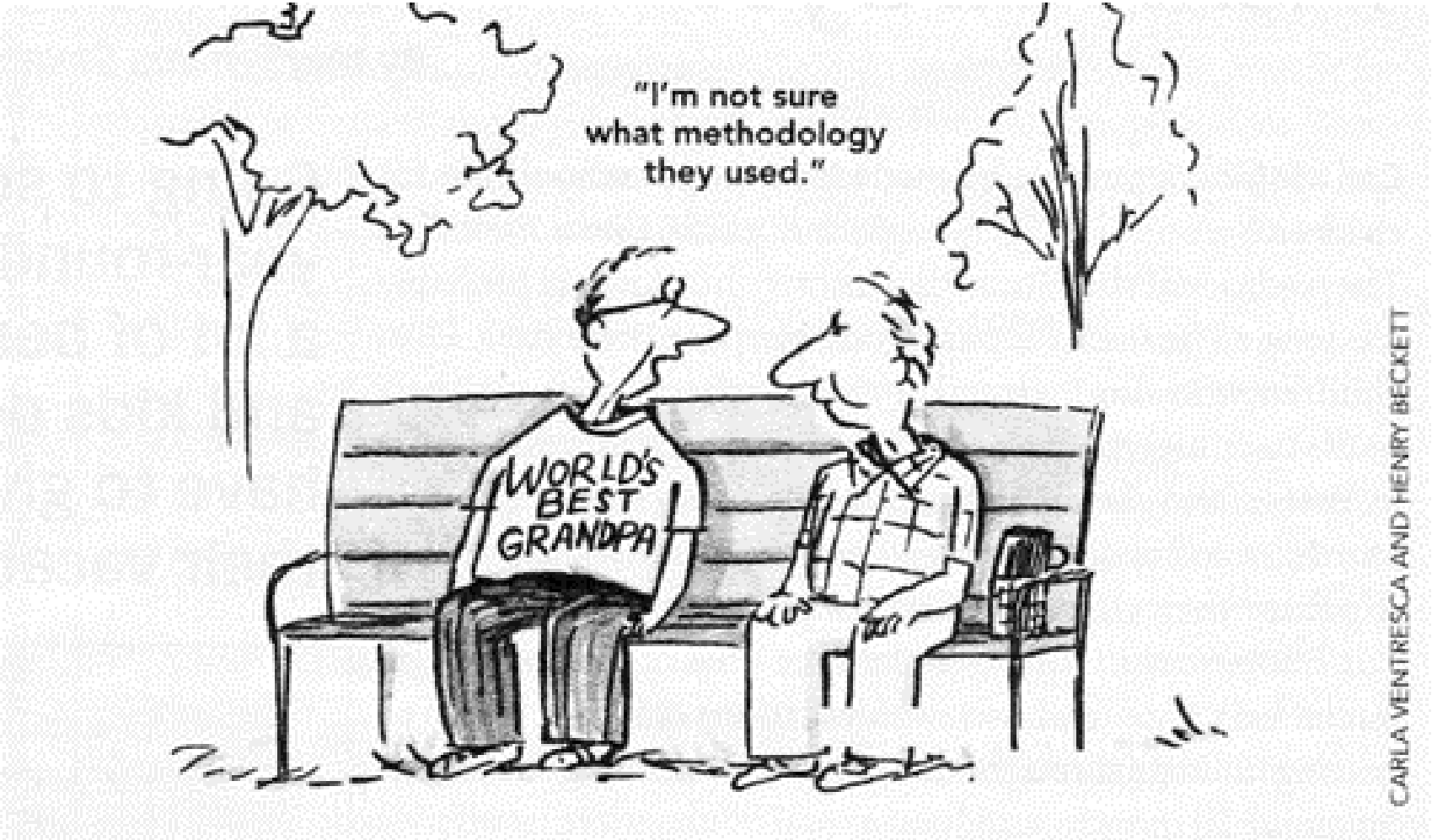
Soc 5: Evaluation of Evidence

Lecture 4: Research Design



Course Logistics

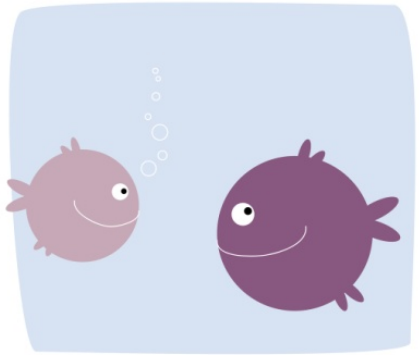
- Waitlist
  - Students who have gotten off of the waitlist and can enroll in the course have been notified. You should receive permission to enroll soon, if you have not already.
- Sections
  - First meetings on Wed 9/11 and Thursday 9/12
  - Section change requests we were able to accommodate have been determined. You should receive confirmation soon, if you have not already.
- GSI office hours start today (for those with Tuesday office hours)
- Questions?

Today's Agenda

- Finish up Paradigms
- Overview of Research Design
- Linking Theories and Hypotheses

What is a paradigm?

- A model or system or framework within which scientists think & use to understand some phenomenon.
- Many paradigms are implicit.
  - It's difficult to recognize a paradigm from within.



"A fish doesn't recognize the water it swims in."

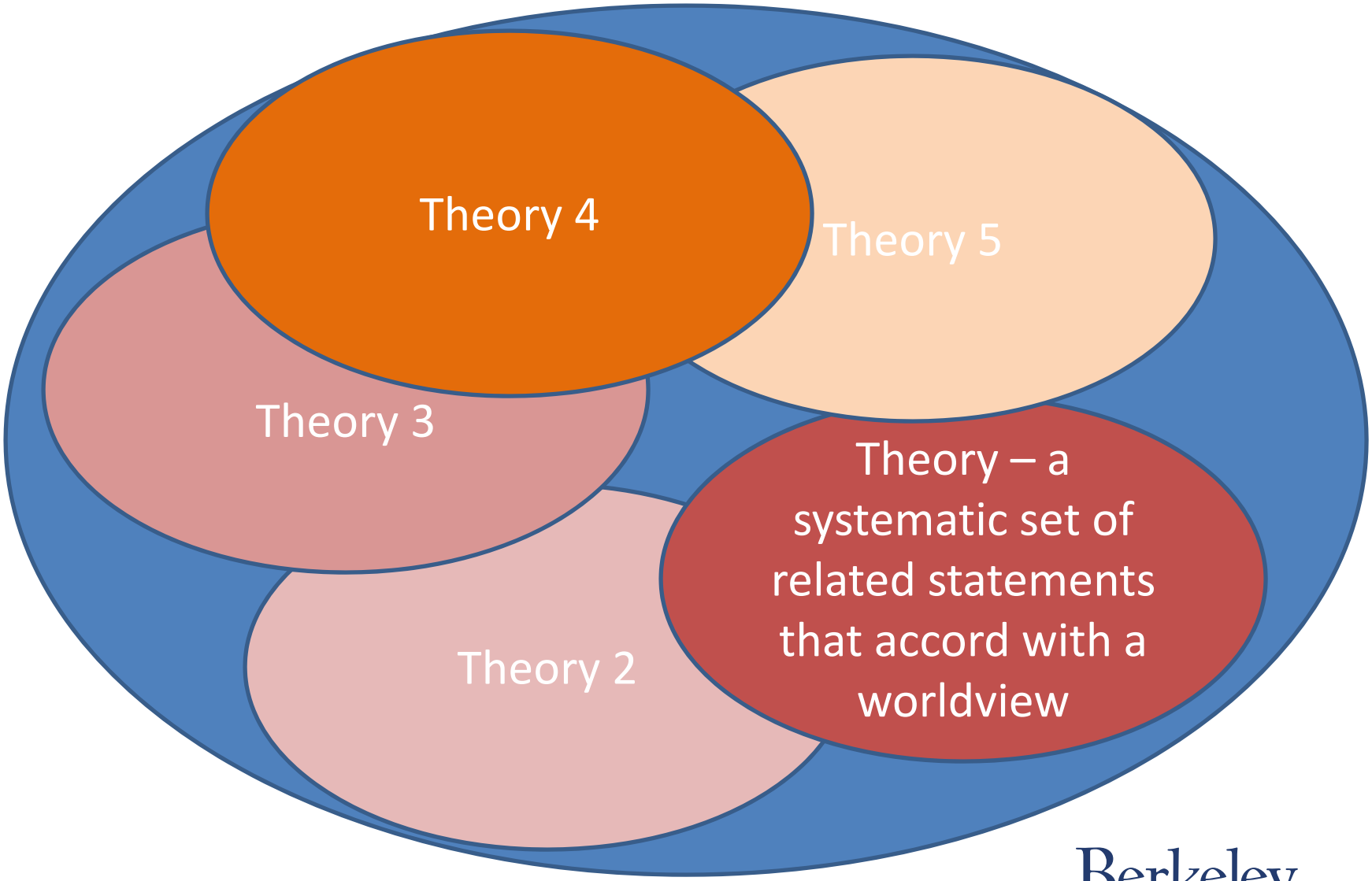
What is a theory?

- **A theory** is a logically interconnected set of propositions, derived from assumptions about essential facts (axioms) and causal mechanisms (unobservables), that yields empirically testable hypotheses about social phenomena.

  (Robert Merton, *Social Theory & Social Structure*, 1968: 39-72)

- Theories are what scientists think within paradigms.

Theories and Paradigms



Theory and Research

When (social) scientists do research, we use theories 3 different ways:

1. Theories prevent us from being taken in by flukes.

2. Theories help us make sense of observed patterns in ways that can suggest other possibilities.

3. Theories direct our research efforts, pointing us toward likely discoveries through empirical observation.

Normal Science

- The relatively routine work of scientists experimenting within a paradigm.
  - They slowly accumulate evidence in accord with established theory.
  - The neither challenge nor attempt to test the underlying assumptions of that theory.

- Kuhn (1970) identified this mode of science as being a form of "**puzzle-solving**."

Benefits & Limitations of Paradigm-Driven Normal Science

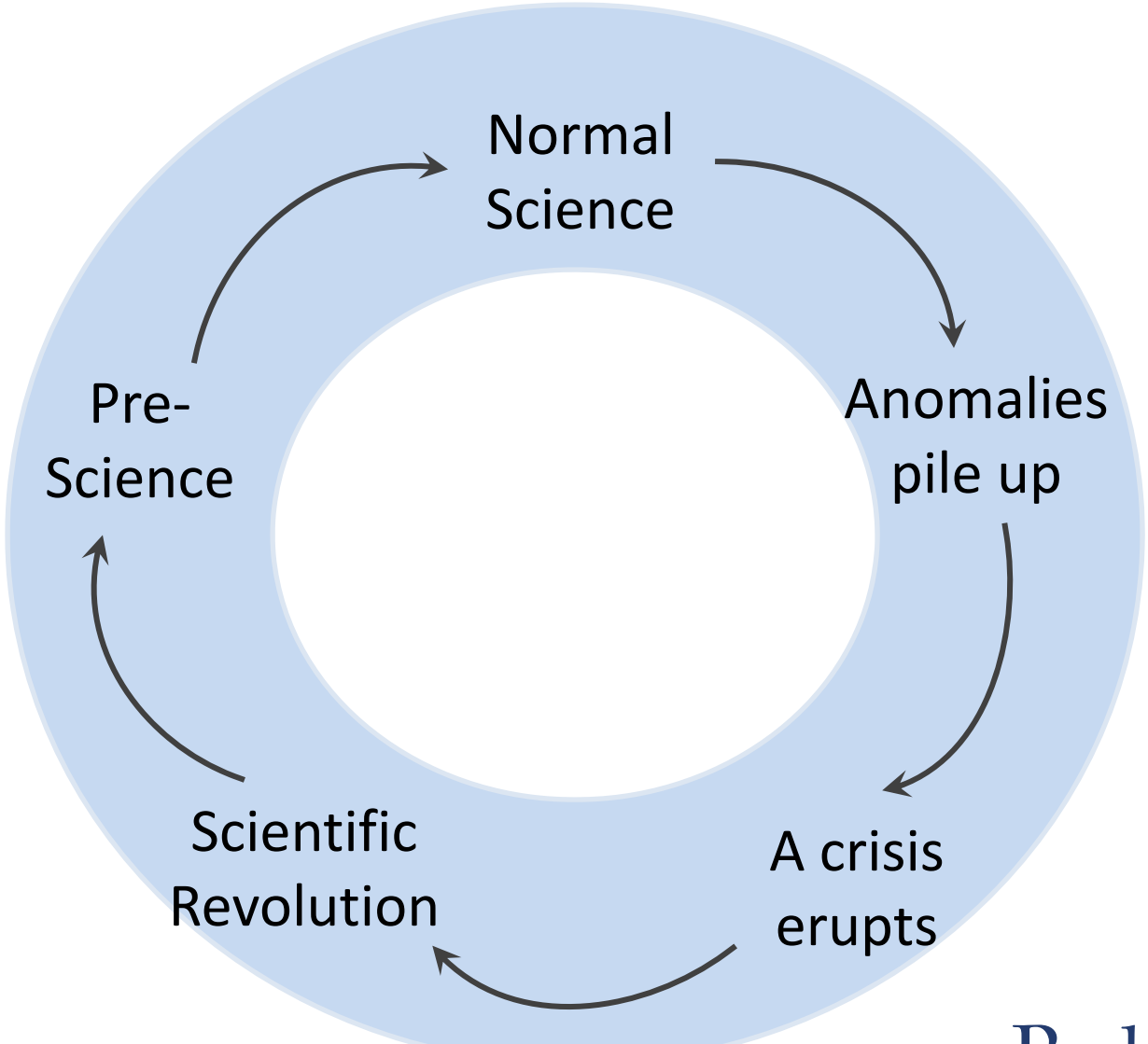
Benefits

- No need to constantly reiterate fundamental assumptions – they can be taken for granted.
- The confidence that you are on the right track encourages scientists to undertake more precise, esoteric, and consuming sorts of work.
  - Fact collection and theory articulation become highly directed activities.
- In sum, the effectiveness and efficiency of research increases greatly.

Limitations

- Normal science does NOT pay attention to new sorts of phenomena.
  - Phenomena that will not fit the paradigm are often not seen at all.
- Scientists do not try to invent new theories.
  - Scientists are often intolerant of new theories invented by others.

How does science evolve?



Paradigms in the Social Sciences

- Normal science???

Paradigms by Level of Analysis

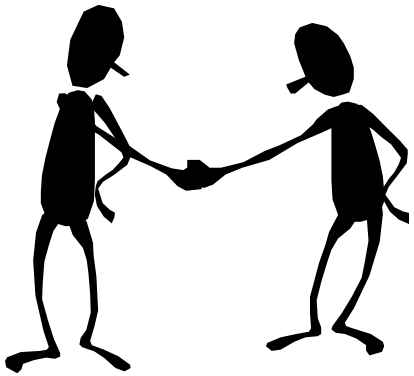
- Macro
- Meso
- Micro

Macrotheory

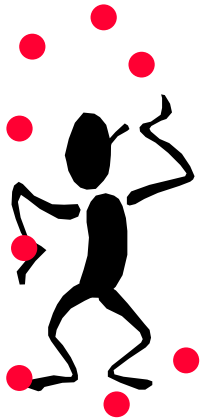
- Deals with large, aggregate entities of society or whole societies.
  - The struggle between classes
  - International relations
  - The diffusion of economic practices and political structures across countries

Mesotheory

- Deals with intermediate-sized units: organizations, social groups/networks, cities/towns/neighborhoods
  - Relationships between a patient and his/her family, on the one hand, and a medical team (doctors, nurses, radiologists, etc.), on the other
  - Peer pressure among students at a school
  - Social cohesion or isolation in a neighborhood



Micro theory



- Deals with issues at the level of individuals and small groups.
  - Dating behavior
  - Jury deliberations
  - Student-faculty interactions
  - The socialization of new employees

Paradigms as Lenses

- Paradigms are never right or wrong
- They are merely different ways of looking at society – **lenses** through which the world is refracted.
- Therefore, paradigms are to be judged as useful or useless in specific situations.

Paradigms in the Social Sciences (4 Examples)

- Paradigms by theoretical focus
  - symbolic interactionism
  - structural functionalism
  - conflict theory
  - rational choice

(Symbolic) Interactionism

- Meaning is created through interaction.

(Structural) Functionalism

- Every piece has its part to contribute to the system.

Conflict

- Social life as attempt to dominate others or avoid being dominated.

Rational Choice

- Individual Decisions are made based on weighing the costs and benefits
- Large-scale patterns are the product of aggregating individual decisions

Last Practice Quiz

What Is Research Design?

- A **plan** for observing the empirical world, and for analyzing the data you gather.
  - To induce a new theory
  - To deduce from/test an existing theory.
- Variables and Unit of Analysis
- Timing of Observations
- Independent, Dependent Variables, Mediators and Moderators

types of social science data

	Self-report data	Observation	'Artifacts'
Action/ behavior	- Number of hrs. studying - Annual income - Contraceptive use	- children's play - job interviews - bar scene	- tweets - police records - newspaper story
Beliefs/ meaning	- racial self-identification - gender ideology on housework	- meaning of religious rituals	- stereo-types in picture books

"social" science data

analyzing social science data
quantitative & qualitative approaches

	Self-report data	Observation	'Artifacts'
Quantitative (numbers)	Interview-based surveys	Field or lab experiment	Statistical, content analysis
Qualitative (words)	In-depth interviewing	Participant observation	Interpretive analysis

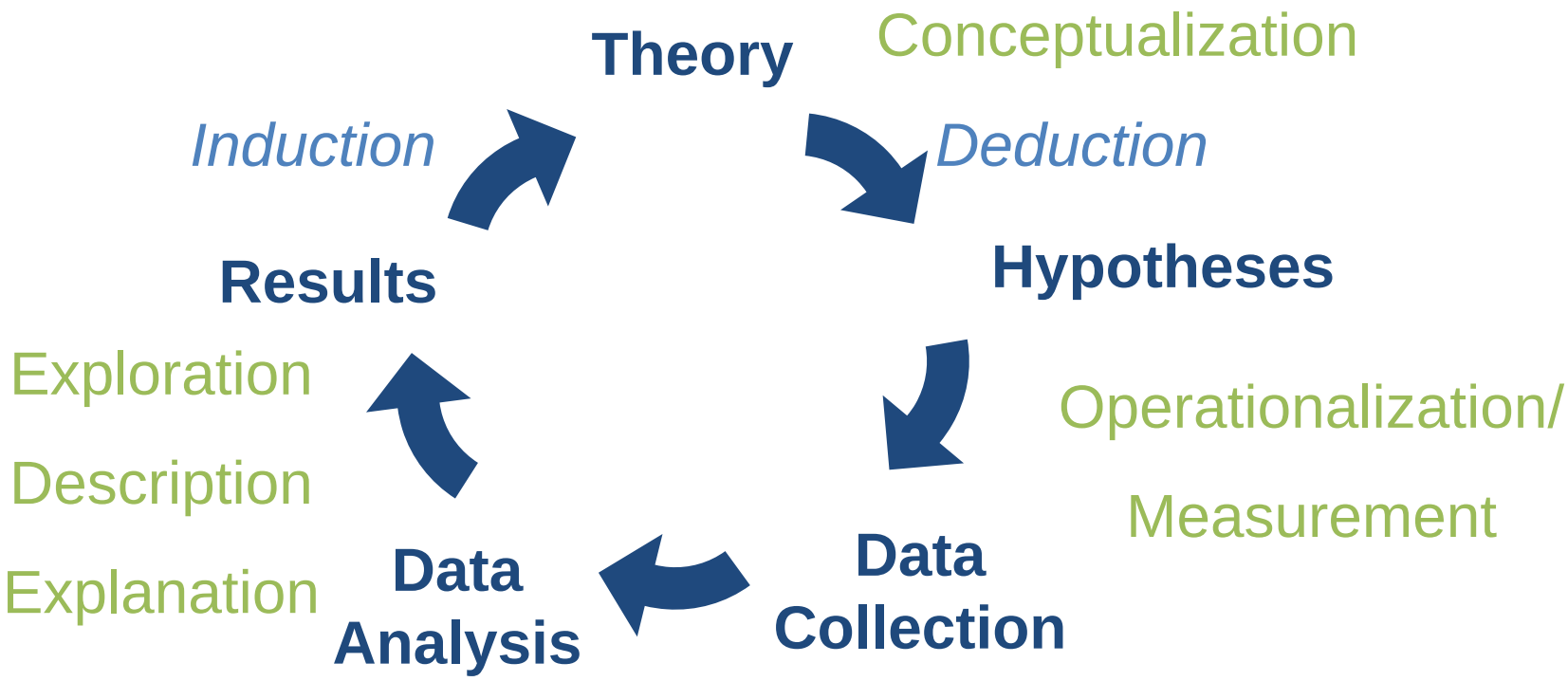
3 Purposes of Research

Exploration

Description

Explanation

Research Process (another wheel)



Research Design: Linking Theories and Hypotheses

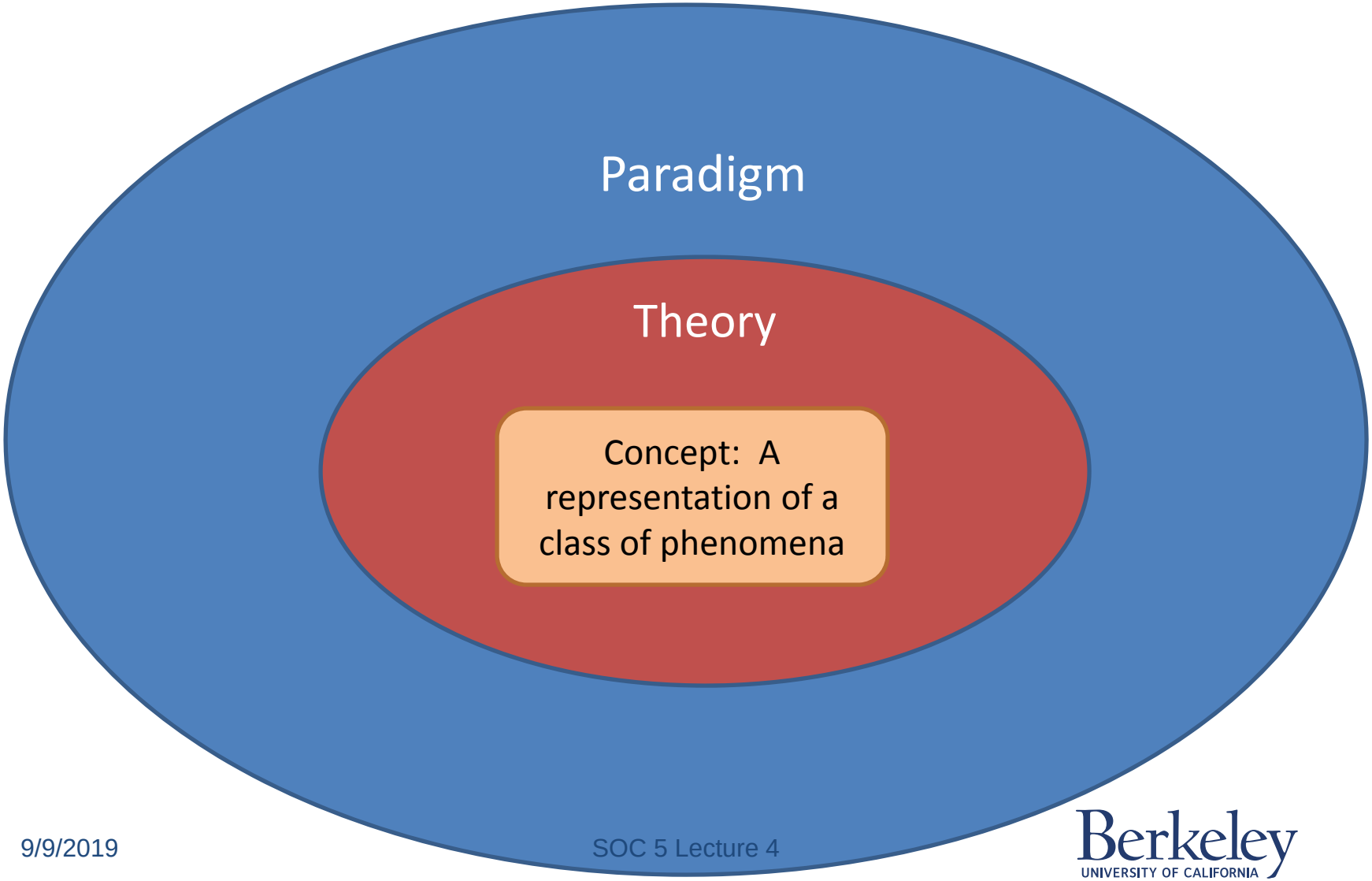
Lessons to be learned today:

- **Theory**: a logically interconnected set of predictions about the world.
- Elements of a scientific (sociological) theory:
  - Concepts
  - Relations between concepts
  - Causal mechanisms

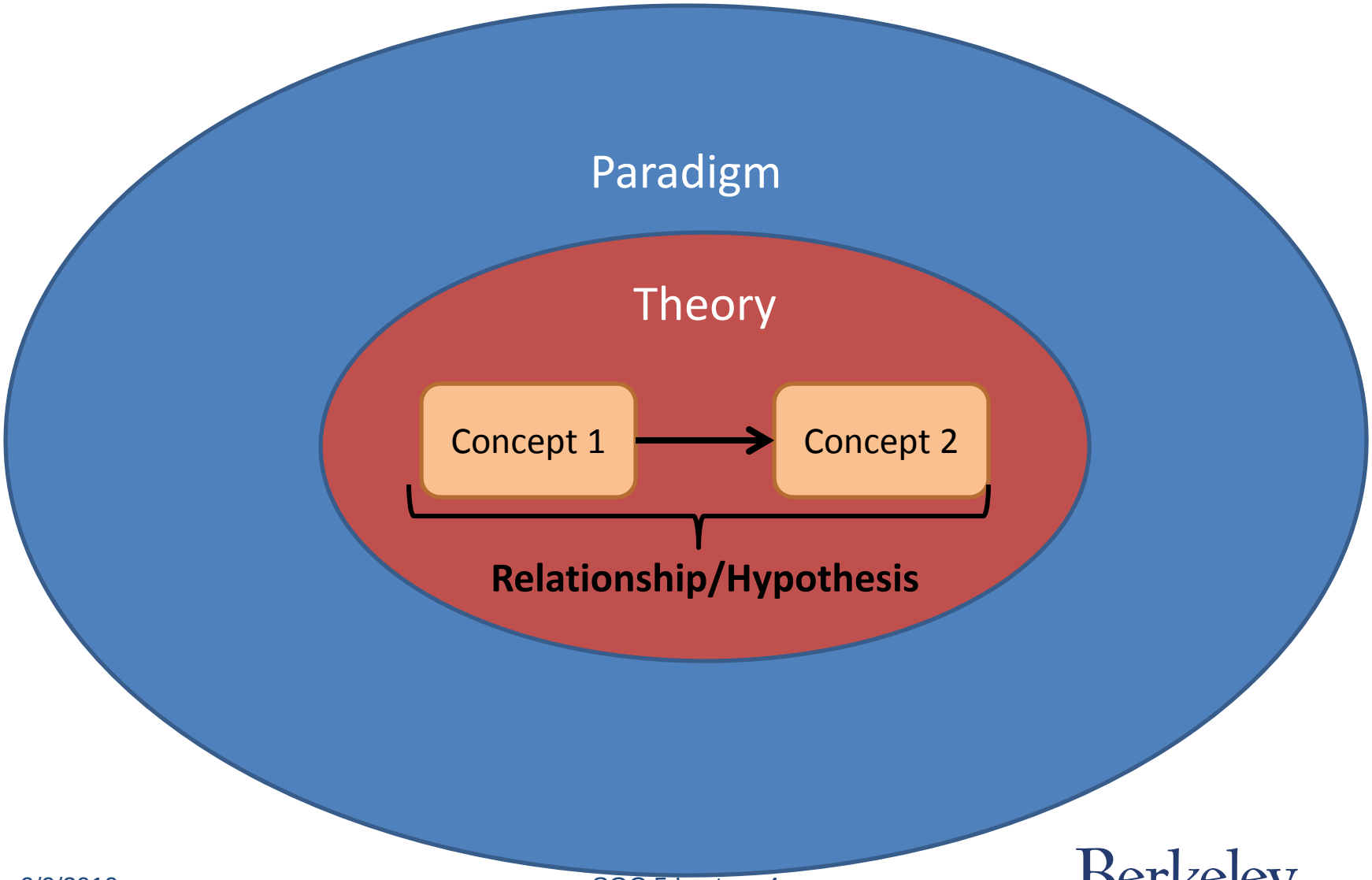
3 Elements of Social Theories

- Concepts
- Relations between concepts
- Causal mechanisms

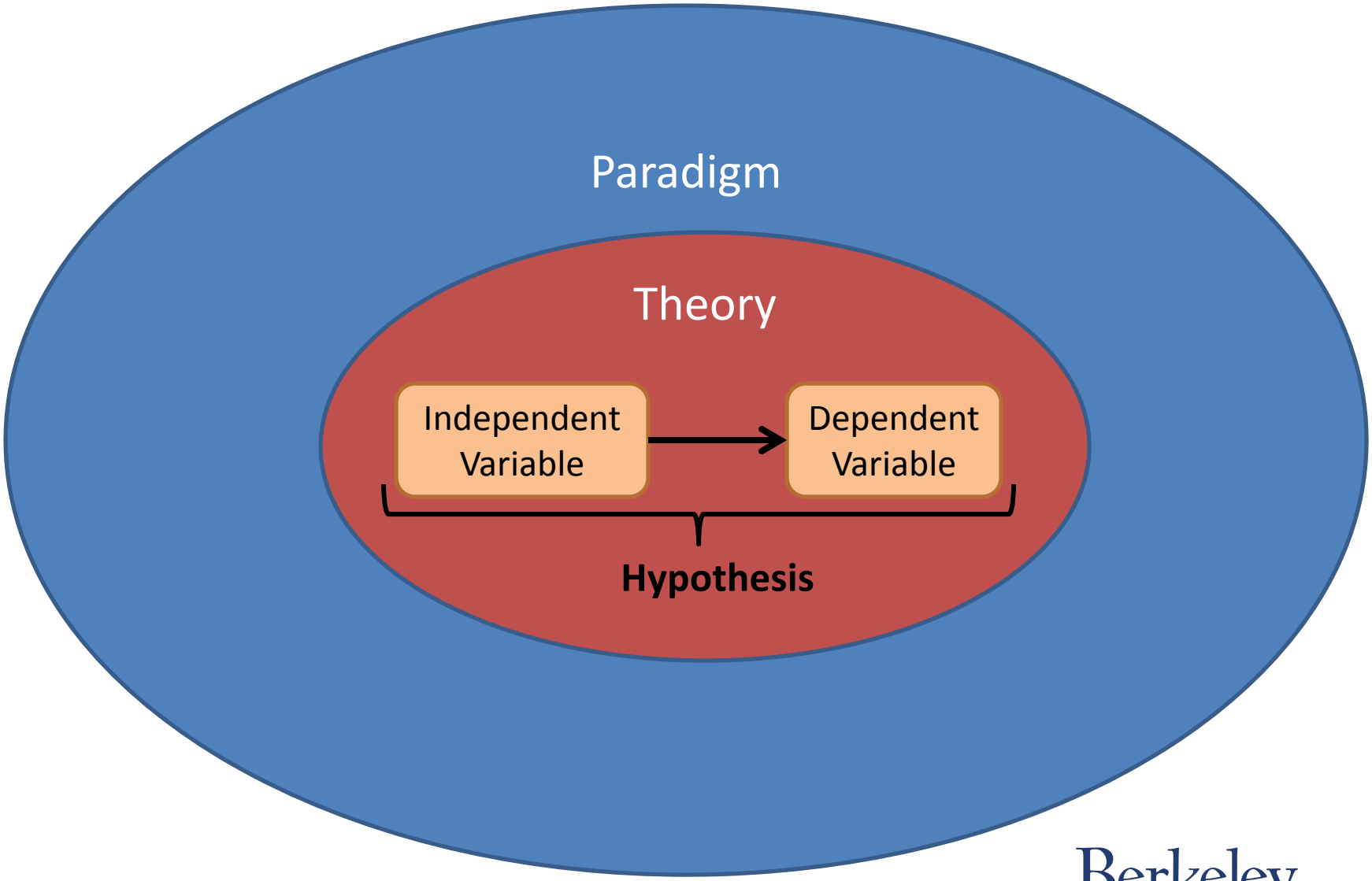
Social Theories



Social Theories

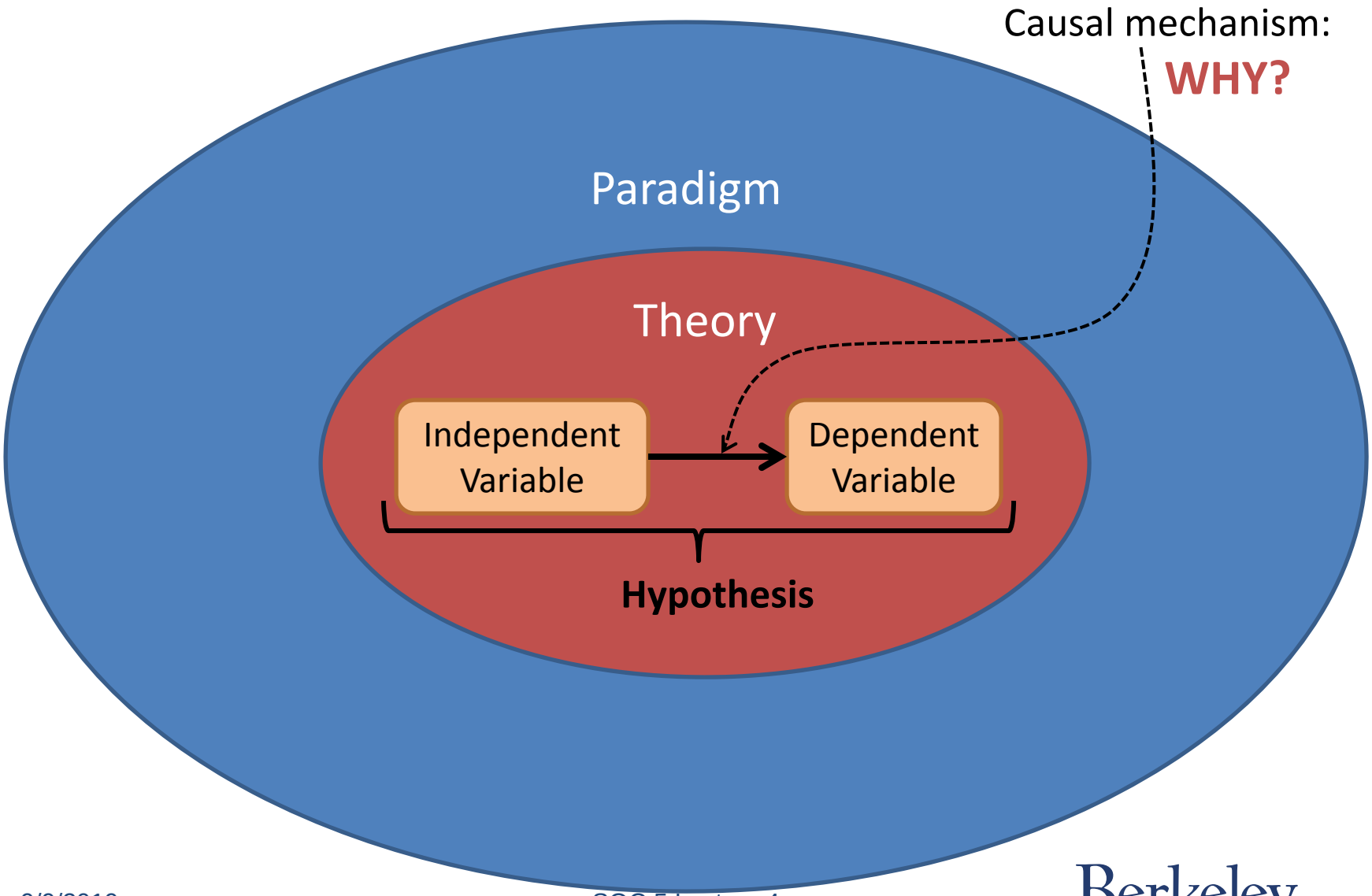


Social Theories



Berkeley
UNIVERSITY OF CALIFORNIA

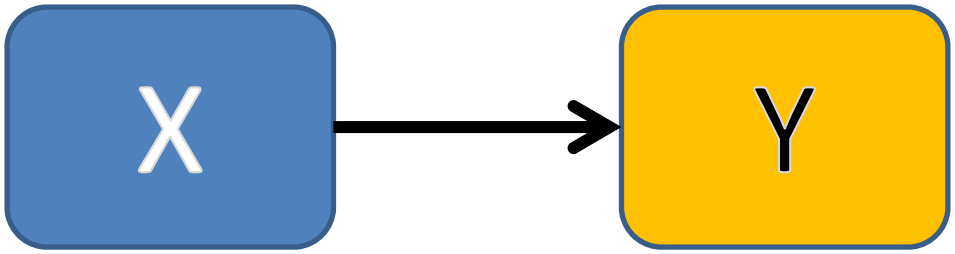
Social Theories



Varieties of Concepts/Variables

Dependent variables – the facts to be explained (Y)

Independent variables – the properties of events, people, and things (X) – that are used to explain the dependent variables (X→Y)

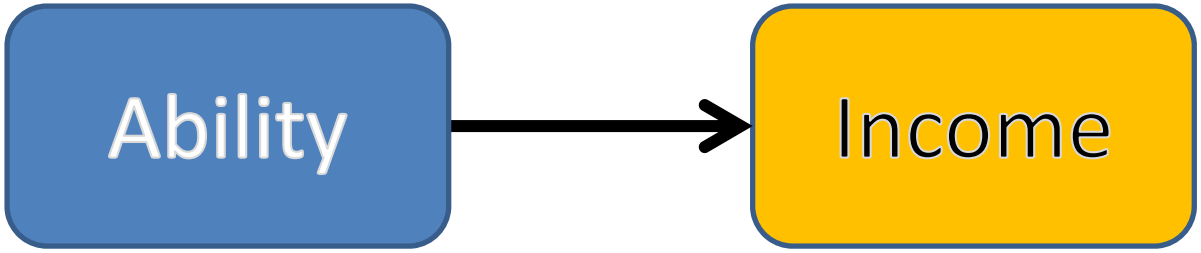


Elements of Social Theories

- **Concepts** – representations of classes of phenomena, constructs, variables
  - Family background (Family Income)
  - Educational Attainment (Years of Schooling or College Degree vs. None)
  - Adult Socioeconomic Status (Income in Adulthood)

- **Statements** – explanations of relationships between concepts (hypotheses)
  - Children from families with higher incomes are more likely to go to college
  - Those with a college degree earn more income than those without a degree

A Plausible Hypothesis

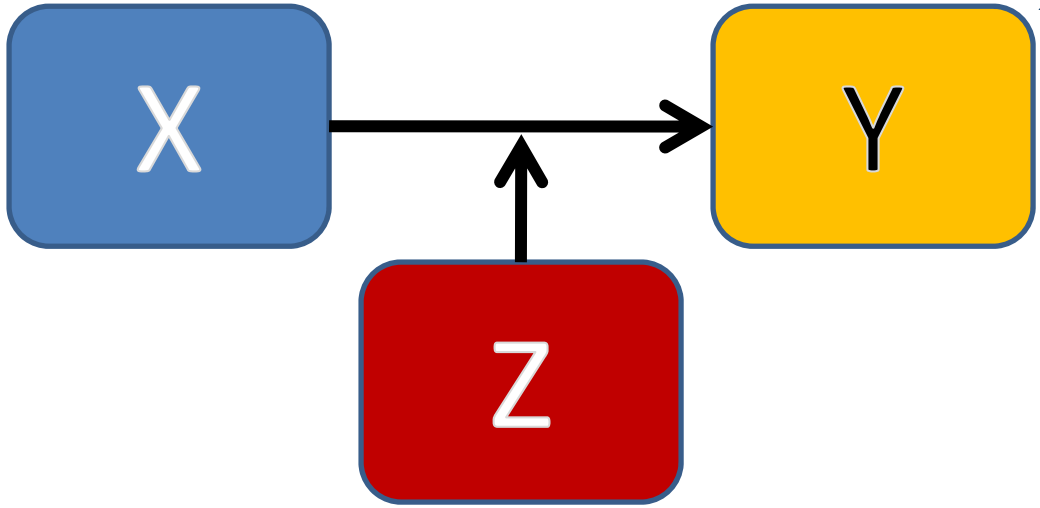


(More) Varieties of Concepts/Variables

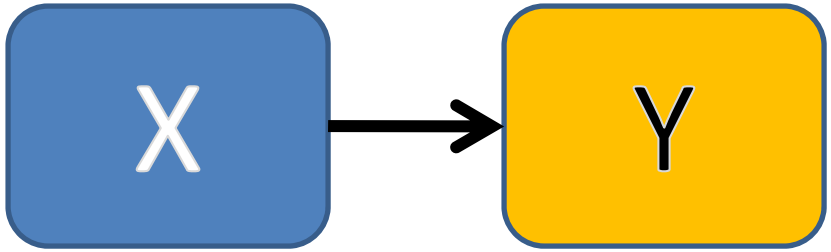
- **Dependent variables** – the facts to be explained (Y)
- **Independent variables** – the properties of events, people, and places (X) – that are used to explain the dependent variables (X→Y)
- **Moderators** – variables that alter the impact of X on Y

  (X → Y if Z=0, X ➔ Y if Z=1)
- **Mediators** – variables that are logically/ causally in-between X & Y (X→Z→Y)

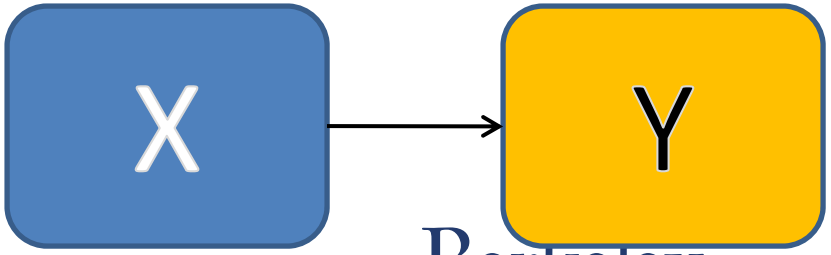
Interaction Effect (a.k.a. Moderator Variable)



Z is present/high:



Z is absent/low:



Mediator Effect

Illustration: The College Debate

- Too much college?

  (mediator effect)

OR

- College for all?

  (moderator/interaction effect)

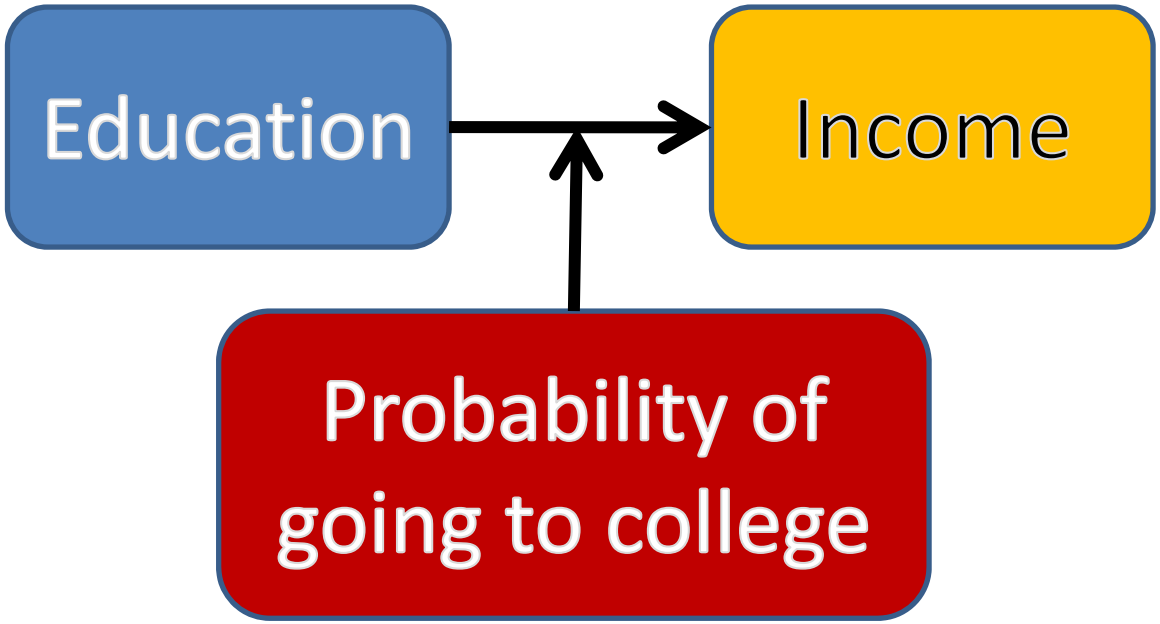
Mediator Effect: Too Much College

Too Much College?: Ability Bias

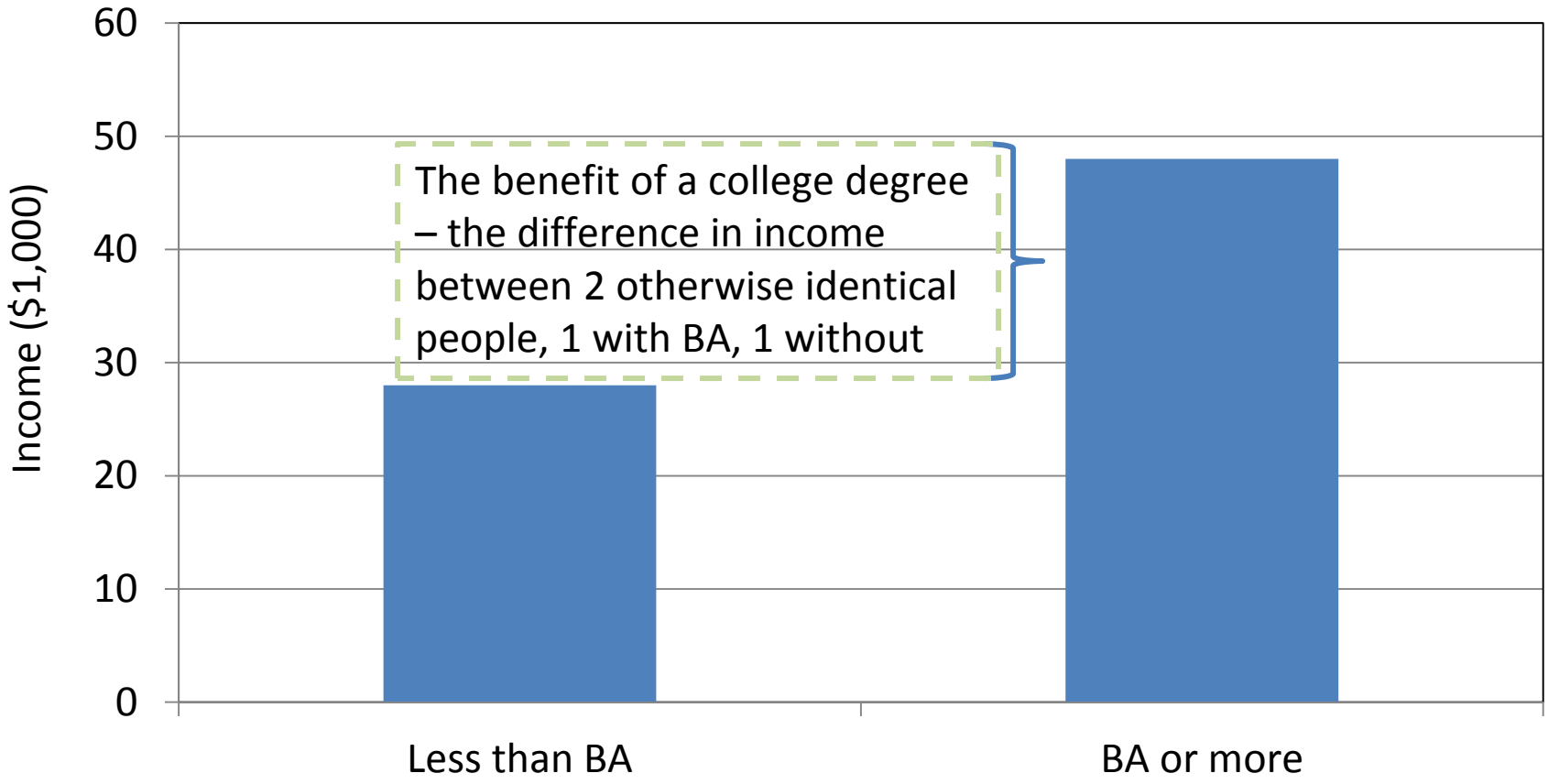
"Maybe education benefits the educated but would not help those who have left or been thrown out. Perhaps young people, schools, and colleges make well-informed decisions about who will benefit from education and who will not. The people who go far in the educational system are those who can take advantage of schooling; the others either drop out or find themselves left out when they have nothing left to gain." (p. 380)

Mike Hout. 2012. Social & economic returns to college education in the United States. *Annual Review of Sociology*, 38: 379-400.

Interaction Effect: College for All

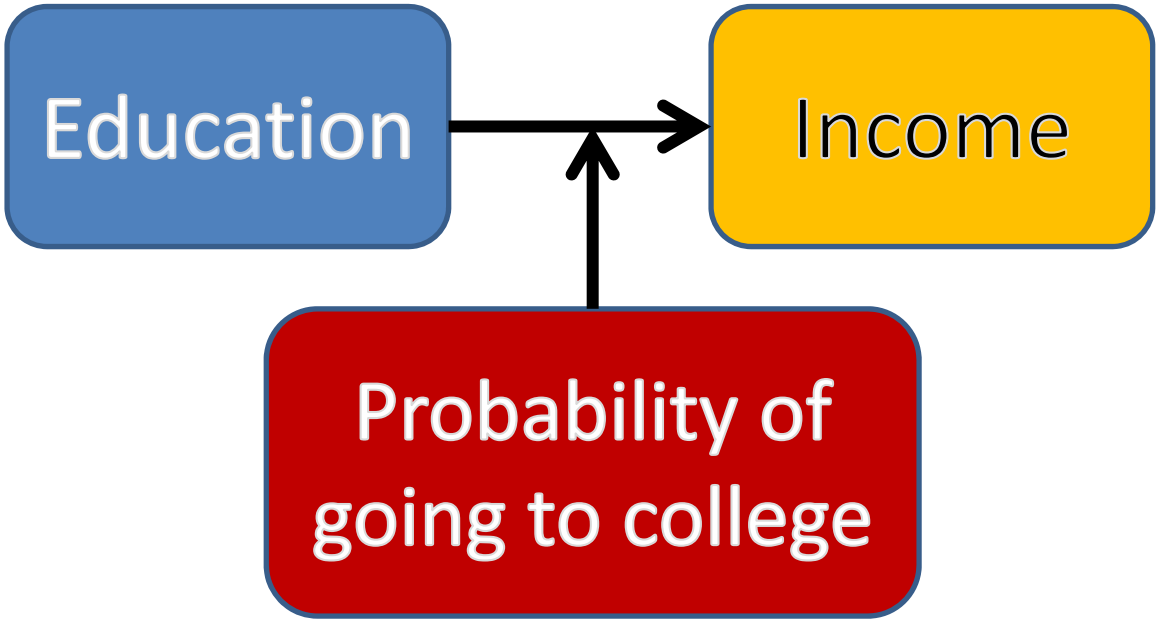


College benefits everyone.



Jennie E. Brand and Yu Xie. 2010. Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American Sociological Review*, 75: 273-302.

But college benefits most those who are least likely to attend college.



Jennie E. Brand and Yu Xie. 2010. Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American Sociological Review*, 75: 273-302.

Variation in the Effect of College by Class

- Jennie Brand and Yu Xie test the idea that “individuals who are least likely to obtain a college education benefit the most from college.”
- They use data on young men and women followed for several decades.
- They estimate the probability of attending college based on test scores, family income, quality of high school, etc...
- Then, they look to see if the effect of actually graduating from college is different for those most likely and least likely to have gone to college.

Variation in the Effect of College by Class

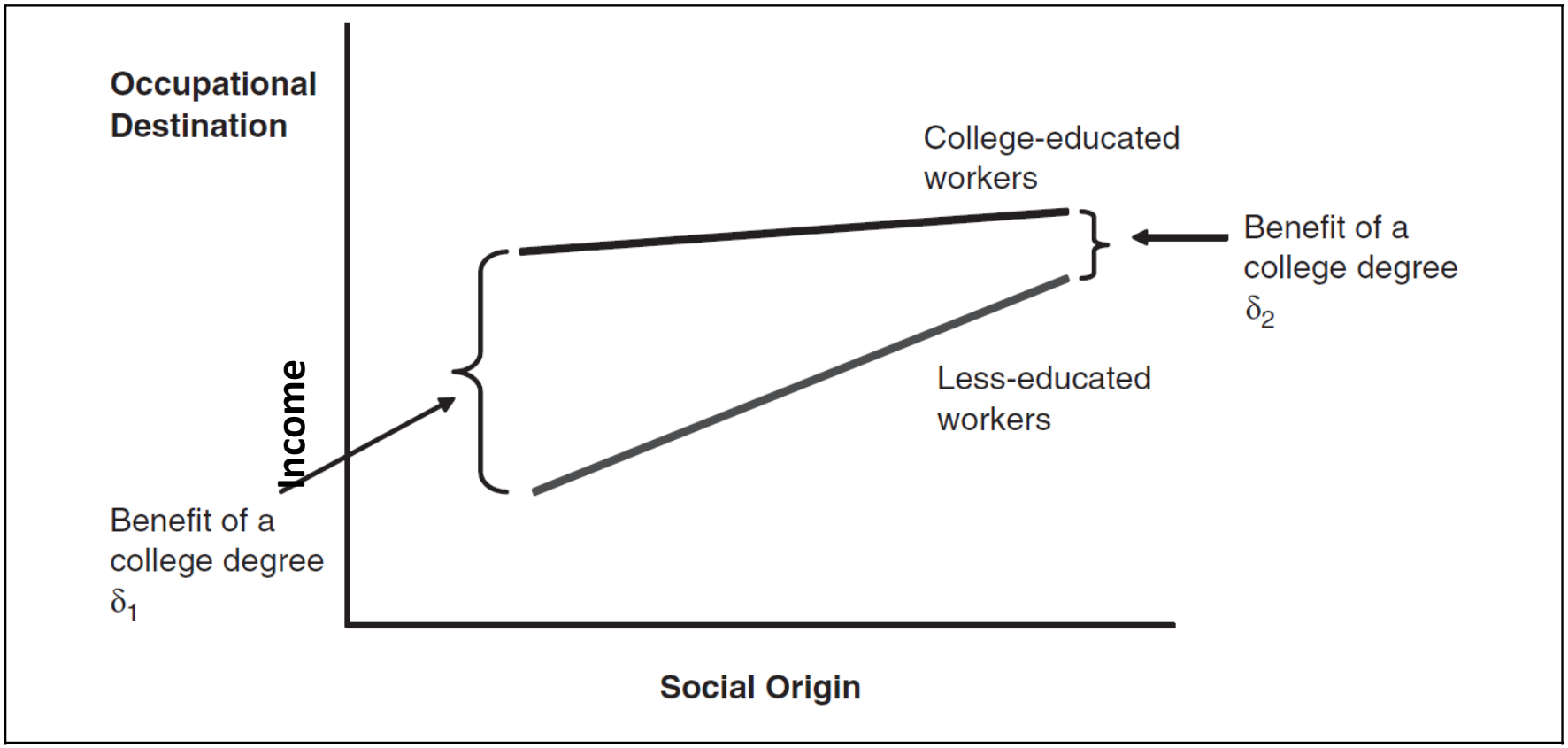


Figure 1. Hypothetical Model: Origin, Education, and Destination

Jennie E. Brand and Yu Xie. 2010. Who benefits most from college? Evidence for negative selection in heterogeneous economic returns to higher education. *American Sociological Review*, 75: 273-302.

Variation in the Effect of College by Class

- Men and women who were least likely to go to college actually benefit the most.
- The effect of college on wages at several different ages is larger for those who were least likely to attend.
- This doesn't mean they earned more than those most likely to attend; it just means they benefited more (the increase in earnings due to college was greater).
- This is strong evidence against ability bias.

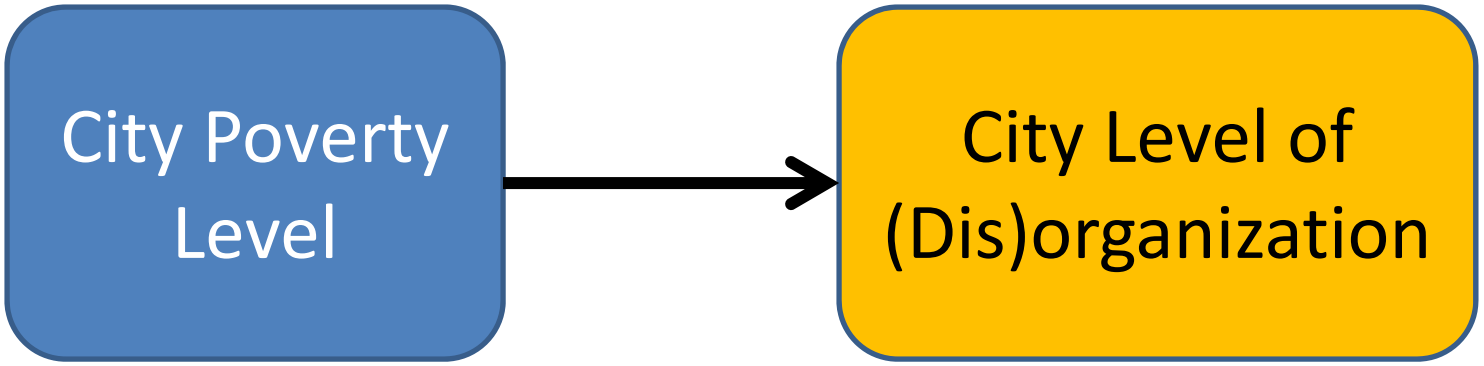
Alternative Theories: 2 Variables

City Poverty Level

City Level of (Dis)organization

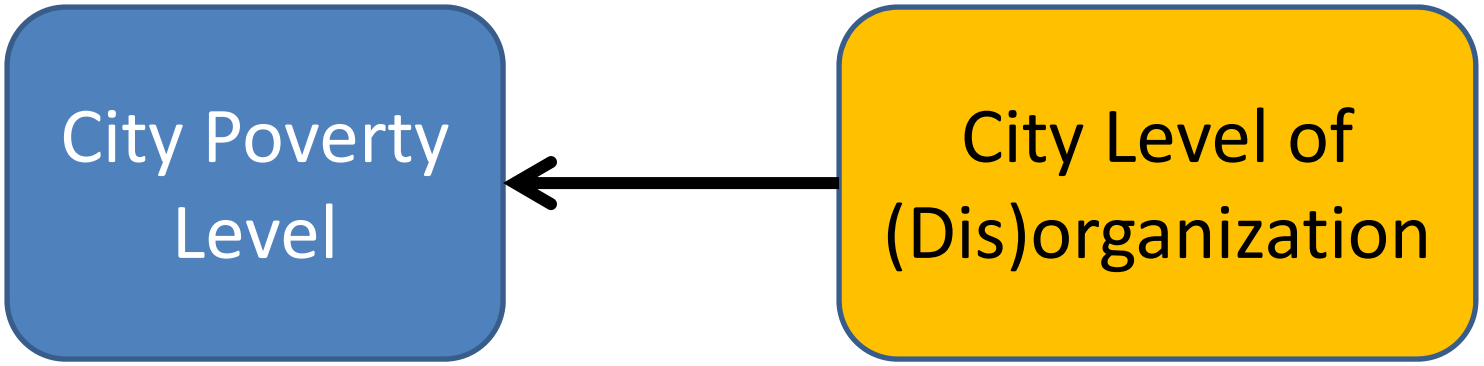
There is no relationship
between poverty & disorganization.

Alternative Theories: 2 Variables



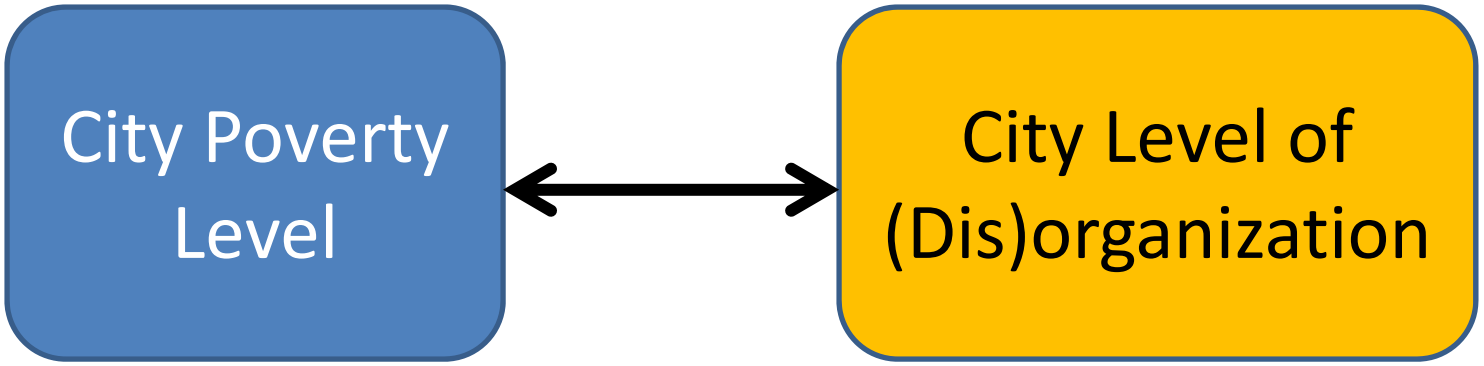
Poverty causes disorganization.

Alternative Theories: 2 Variables



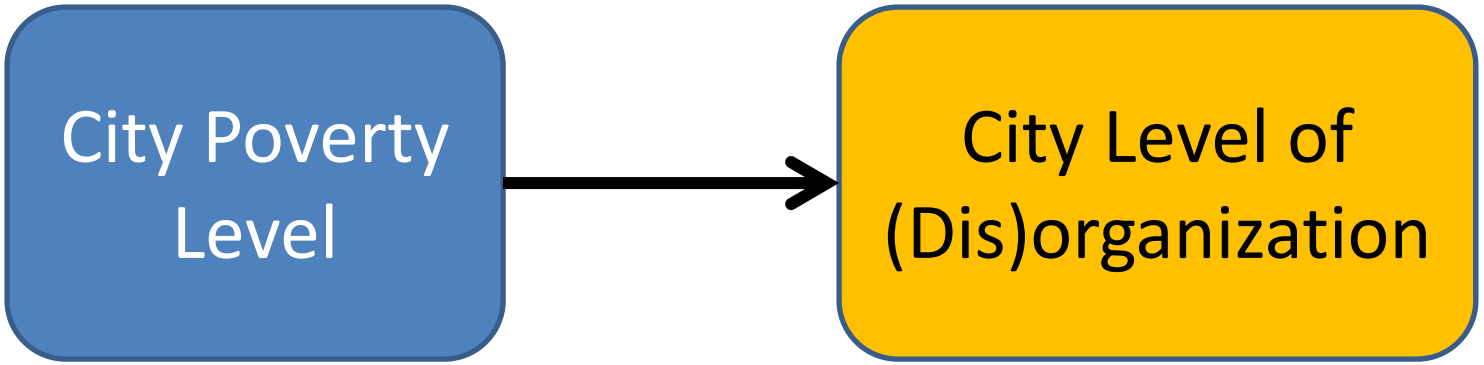
Disorganization causes poverty.

Alternative Theories: 2 Variables



Poverty and disorganization reinforce each other.

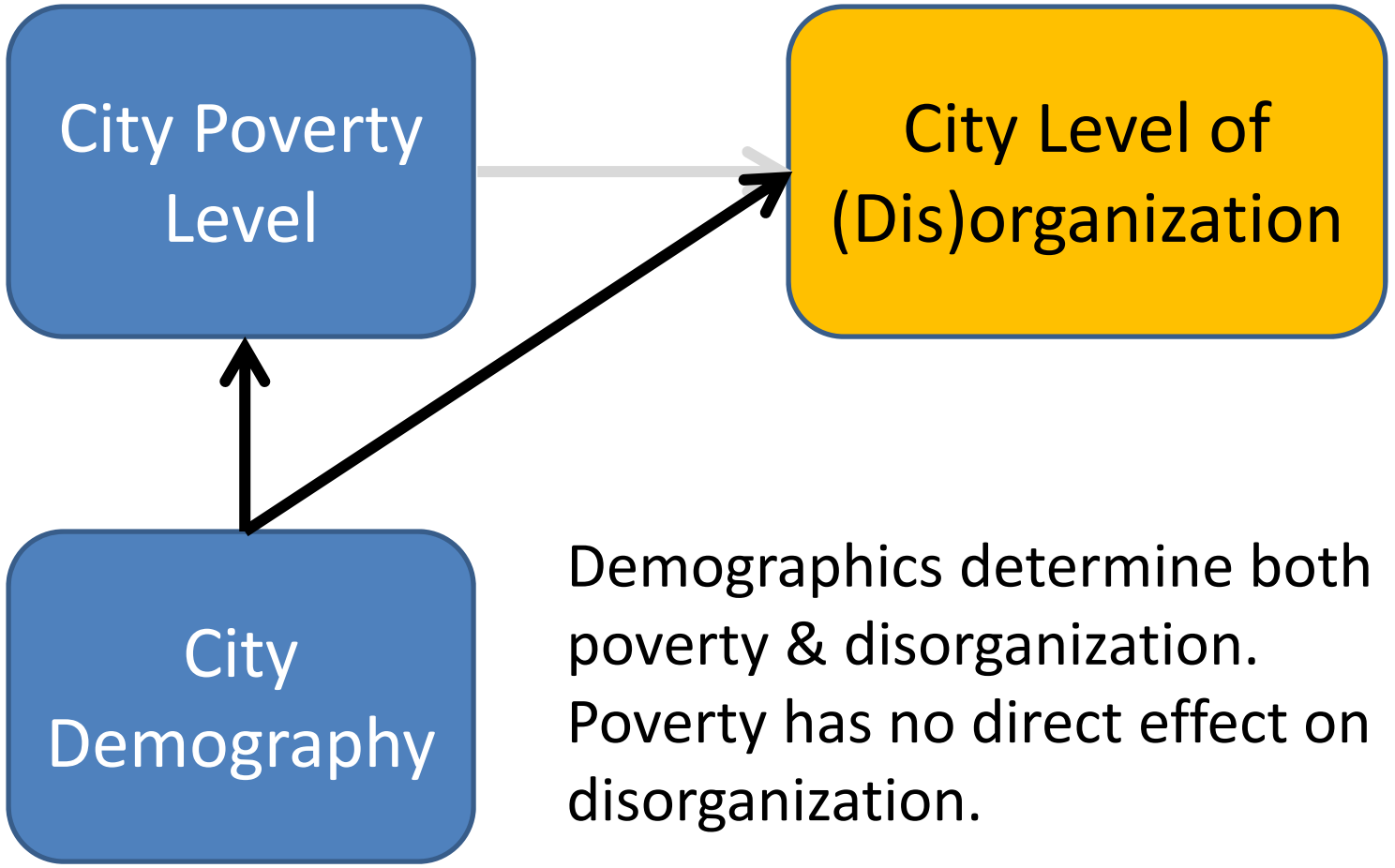
Alternative Theories: 3 Variables



City Demography

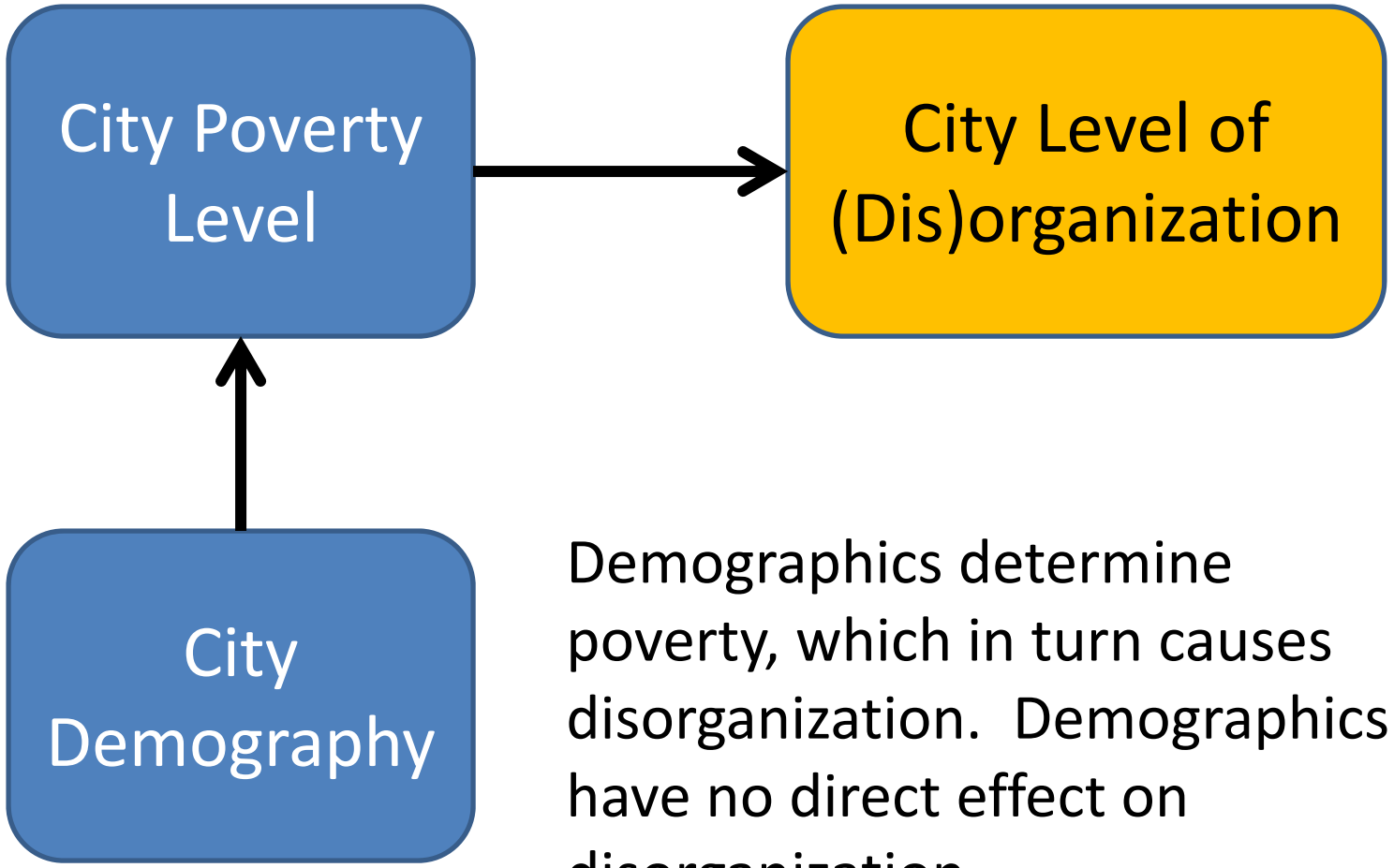
Poverty causes disorganization, but demographics have no effect on either variable.

Alternative Theories: 3 Variables



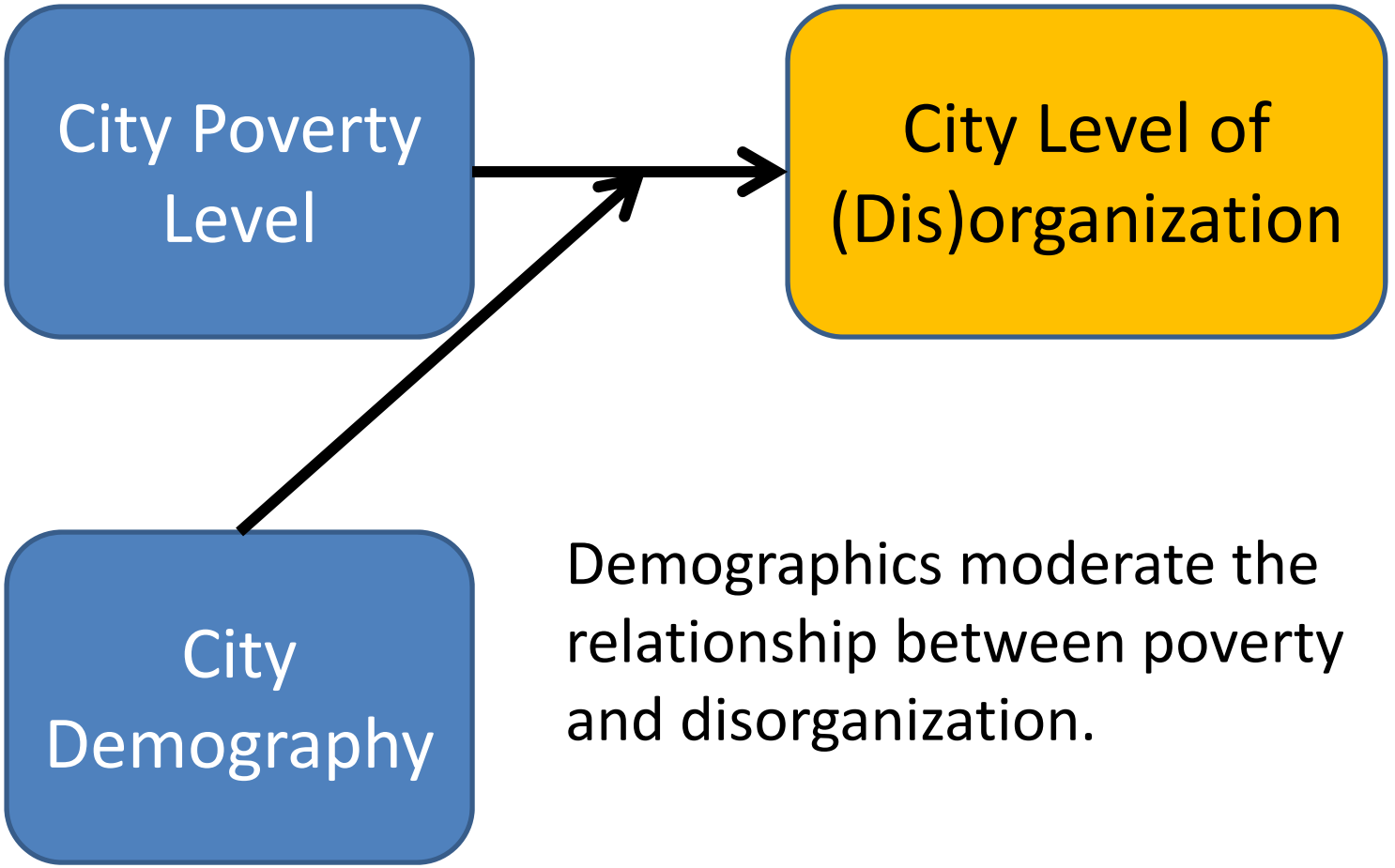
Demographics determine both poverty & disorganization. Poverty has no direct effect on disorganization.

Alternative Theories: 3 Variables



Demographics determine poverty, which in turn causes disorganization. Demographics have no direct effect on disorganization.

Alternative Theories: 3 Variables



Demographics moderate the relationship between poverty and disorganization.

What Good Theories Have in Common

- They can be tested using empirical data – data gathered through some observation plan.
- They apply to units outside/beyond the sample that is currently under study.
- They make probabilistic, not deterministic, predictions (i.e., hypotheses). Examples:
  - Men are **more likely** than women to be over-confident.
  - In countries where women have higher status, women's and men's math scores **tend to be** more similar.

Readings for Next Class

- Ian Dey. 1999. Introduction. Chapter 1 in *Grounding Grounded Theory: Guidelines for Qualitative Inquiry*, pp. 1-12. New York: Academic Press. (***don't need to read entire PDF***)

- Howard S. Becker. 1953. Becoming a marihuana user. *American Journal of Sociology*, 59 (3): 235-242.

Questions to Ponder

- Why can we say that Becker's article takes an inductive sociological approach?
- What role does theory play in his argument?
- In what ways does he provide an example of pure inductive research, and in what way does he deviate from pure induction?
- How might a researcher build on Becker's findings to study drug users today?