Social Data Science

SOCIOL 114
Winter 2025

Lecture 1: Asking Research Questions

Learning goals for this course

By the end of this course, you will be able to

- visualize economic inequality with graphs that summarize survey data
- connect theories about inequality to quantitative empirical evidence
- evaluate the effects of hypothetical interventions to reduce inequality
- conduct data analysis using the R programming language

What makes a good quantitative research question?

Keys to a good research question

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    - a row of your dataset

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   - a set of units about whom to infer
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4. potential for surprising results

A good project may have a very simple question

Example: Prevalence of housing eviction

Lundberg & Donnelly 2019

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  - (and subgroups by race and income)
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Future of Families
& Child Wellbeing Study
PRINCETON | COLUMBIA

H19. We are also interested in some of the problems that families face making ends meet. In the past 12 months, did you do any of the following because there wasn't enough money?

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	YES	NO
H19E. (In the past 12 months), were you evicted from your home or apartment for not paying the rent or mortgage?	1	2

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- we filled in missing values with regression
- we gathered responses across years

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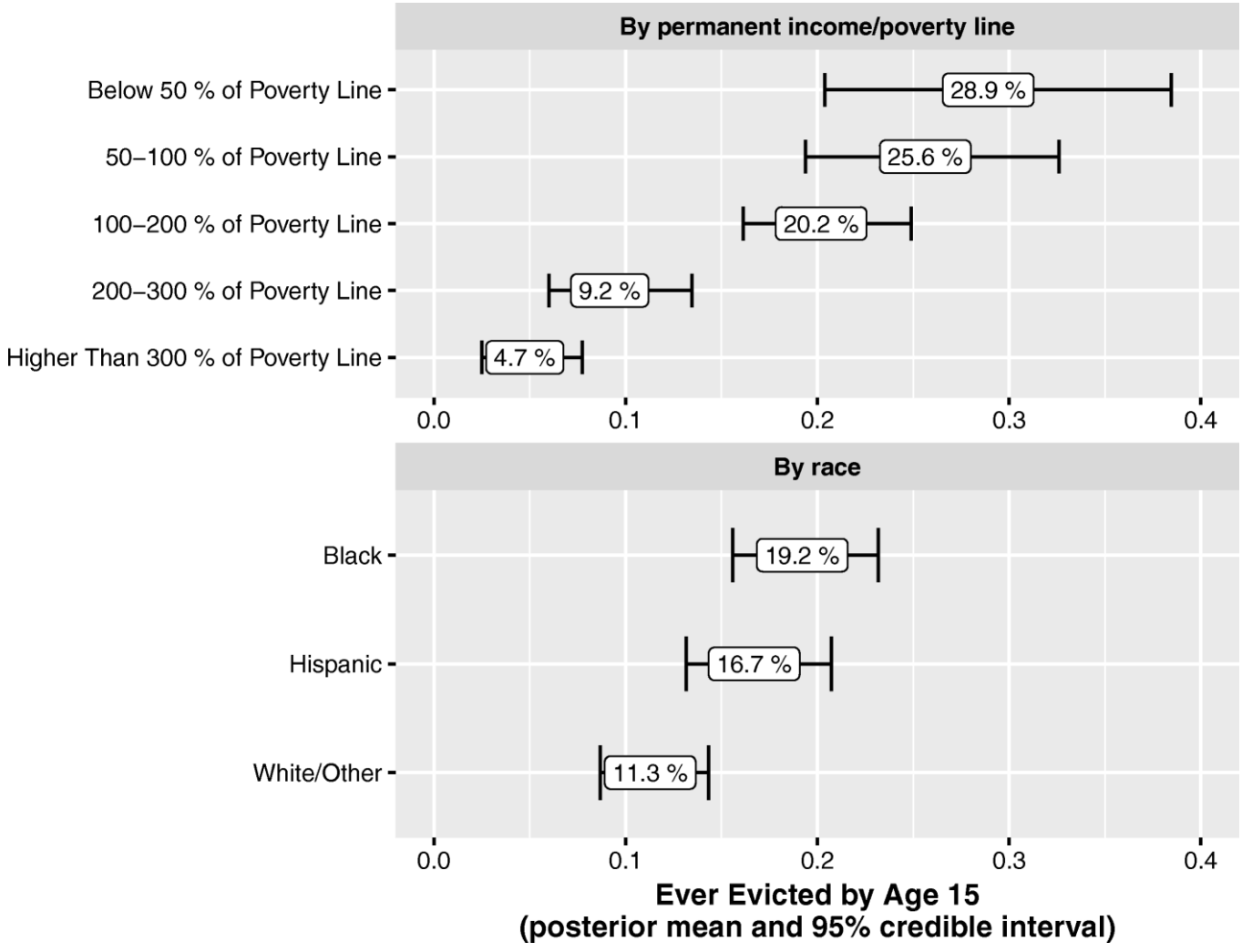

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Course logistics

soc114.github.io

What about this course makes you feel anxious?

What about this course makes you feel excited?

Appendix: Causal research question

Describe a population

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among U.S. resident women ages 21–35?

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Woman 1
Woman 2
Woman 3
Woman 4

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	Employed?
Woman 1	1
Woman 2	0
Woman 3	1
Woman 4	1

Describe population subgroups

What is the proportion employed
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	Employed?
Mother 1	0
Mother 2	0
Mother 3	0
Mother 4	1

	Employed?
Non-Mother 1	1
Non-Mother 2	0
Non-Mother 3	1
Non-Mother 4	1

Causal effect in a population

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What is the average causal effect of motherhood on employment among U.S. resident women ages 21–35?

	Would be employed if a mother? $Y(1)$	Would be employed if a non-mother? $Y(0)$
Woman 1	0	1
Woman 2	0	0
Woman 3	0	1
Woman 4	1	1

Causal effect in a population

What is the average causal effect of motherhood on employment among U.S. resident women ages 21–35?

	Would be employed if a mother? $Y(1)$	Would be employed if a non-mother? $Y(0)$	Causal effect $Y(1) - Y(0)$
Woman 1	0	1	-1
Woman 2	0	0	0
Woman 3	0	1	-1
Woman 4	1	1	0

Describe population subgroups

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	Employed?
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Mother 2	0
Mother 3	0
Mother 4	1

	Employed?
Non-Mother 1	1
Non-Mother 2	0
Non-Mother 3	1
Non-Mother 4	1

Very **different** research goals

Causal effect in a population

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	Would be employed if a mother? $Y(1)$	Would be employed if a non-mother? $Y(0)$	Causal effect $Y(1) - Y(0)$
Woman 1	0	1	-1
Woman 2	0	0	0
Woman 3	0	1	-1
Woman 4	1	1	0

Language for descriptive and causal questions

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Descriptive

among

across

difference

for those who

Language for descriptive and causal questions

Descriptive	Causal
among	causes
across	affects
difference	produces
for those who	impacts

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Descriptive	Murky Middle	Causal
among	associated with	causes
across	leads to	affects
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↑
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Statements "predictor **verb** outcome" are often causal

(analysis needs a DAG!)

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↑ **not verbs**		↑ **verbs**

Statements "predictor **verb** outcome"
are often causal

(analysis needs a DAG!)

Statements "**among subpopulation**, mean outcome"
are often descriptive

Example: Effect of public housing on eviction

Lundberg et al. 2021

What proportion of children
born in large U.S. cities in 1998–2000
who lived in public housing at age 9
would have been evicted at age 9–15
if they had lived in a private rental?

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  - a child
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  - children born in large U.S. cities in 1998–2000 who lived in public housing at age 9
- outcome
  - evicted from home between age 9 and 15

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For every kid in public housing,
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We **assumed** those rates would have happened
to our target population in the absence of public housing

Effect of **public housing** on **eviction**