Social Data Science

SOCIOL 114
Winter 2026

Lecture 1: Welcome + Empirical Questions

Learning goals for this course

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

- 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

Figure from Piketty & Saez (2014)

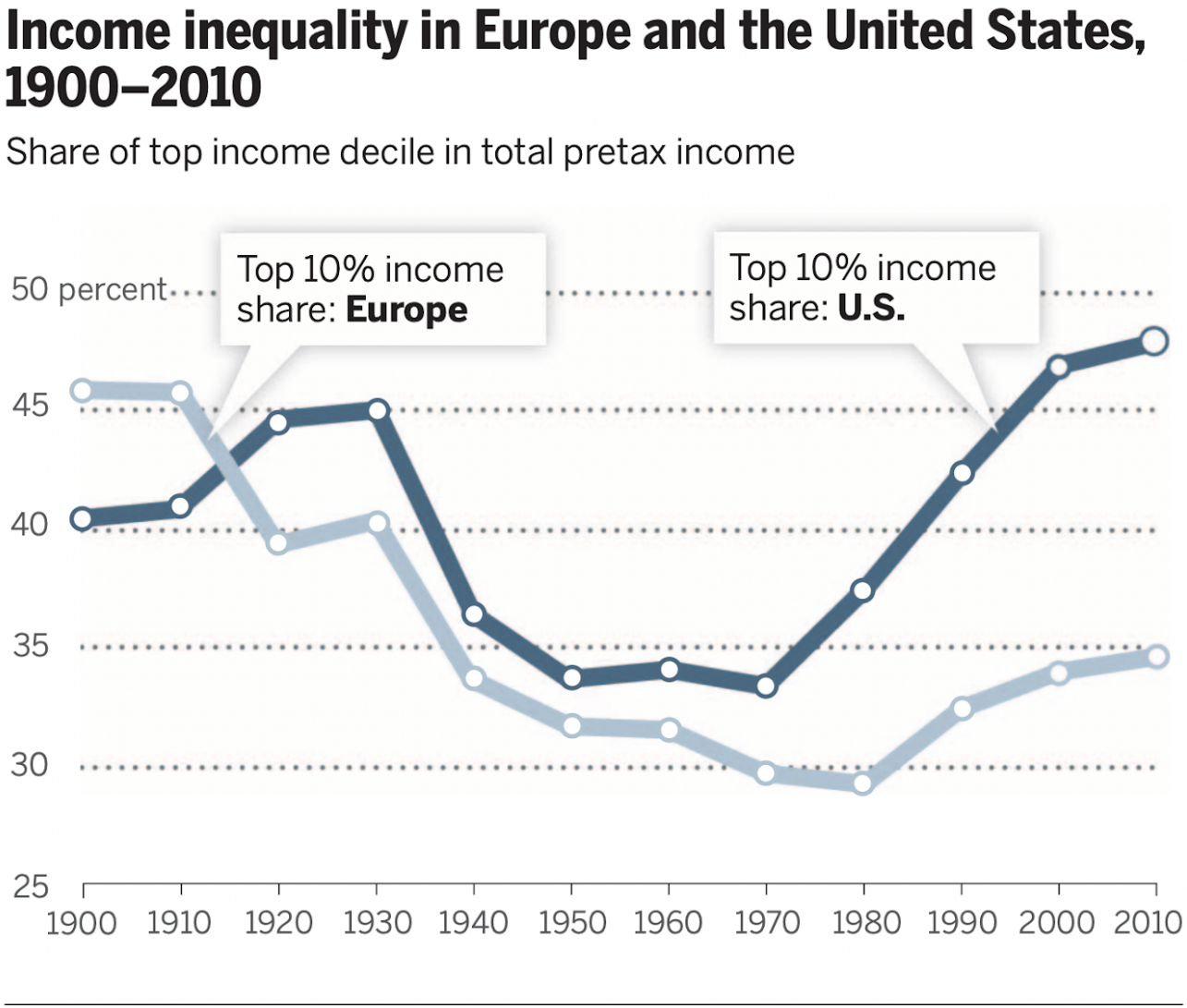

Fig. 1. Income inequality in Europe and the United States, 1900 to 2010.

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
   - clear who is included and who is not

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   - a variable with a value for each unit
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   - a set of units about whom to infer
   - clear who is included and who is not
4. potential for surprising results

A good project may have a very simple question

Example: Prevalence of housing eviction

Lundberg & Donnelly 2019

What proportion of children born in large U.S. cities in 1998–2000 was ever evicted from their home from birth to age 15?

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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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4. potential for surprising results

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

What is the proportion employed
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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comparing mothers to non-mothers?

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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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Woman 2	0
Woman 3	0
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	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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among U.S. resident women ages 21–35,
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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

What is the 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

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

Language for descriptive and causal questions

Descriptive	Murky Middle	Causal
among	associated with	causes
across	leads to	affects
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not verbs		**verbs**

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

(analysis needs a DAG!)

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among	associated with	causes
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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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- unit of analysis
  - a child
- target population
  - 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

We took the same dataset:

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For every kid in public housing,
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among kids who **looked like them**
but who live in a private rental

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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**