In-person session 4

February 3, 2022

PMAP 8521: Program evaluation
Andrew Young School of Policy Studies

Plan for today

Quick useful R tips

Measuring outcomes

DAGs

Quick useful R tips

Visual markdown editor

Weird figure/table placement in PDFs

Word count

Figure and table captions and numbers

DAGs in R vs. Dagitty

Measuring outcomes

Outcomes and programs

Outcome variable

Thing you're measuring

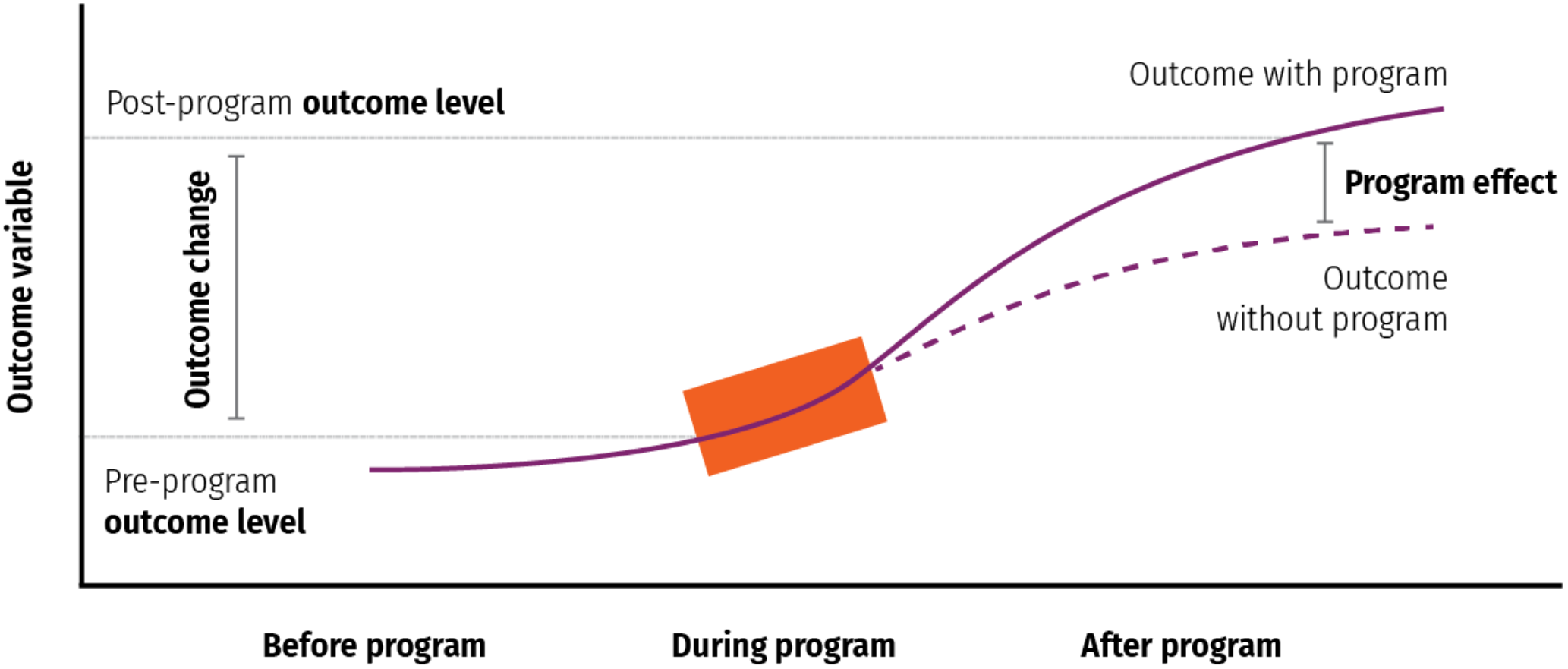
Outcome change

Δ in thing you're measuring over time

Program effect

Δ in thing you're measuring over time *because of* the program

Outcomes and programs



Abstraction

DAGs

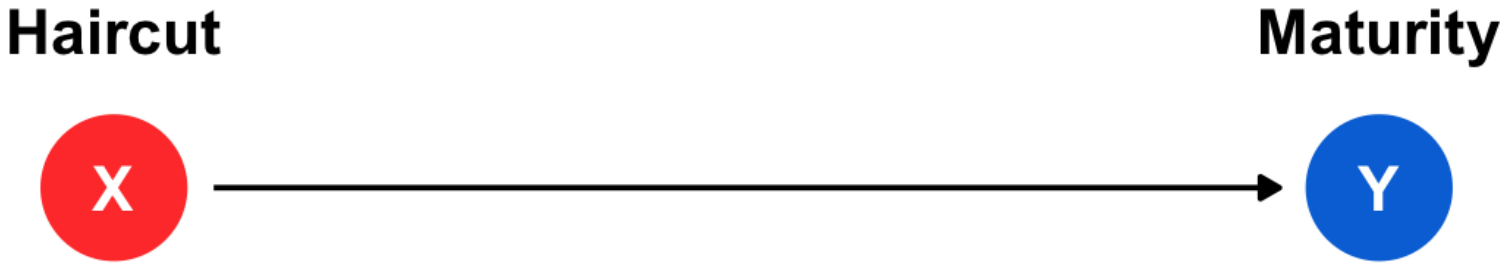
You keep saying that causal inference lets you "legally" make causal claims.

Are there actual legal consequences if you make a causal claim without specific language?

Causal thinking is necessary—even for descriptive work!

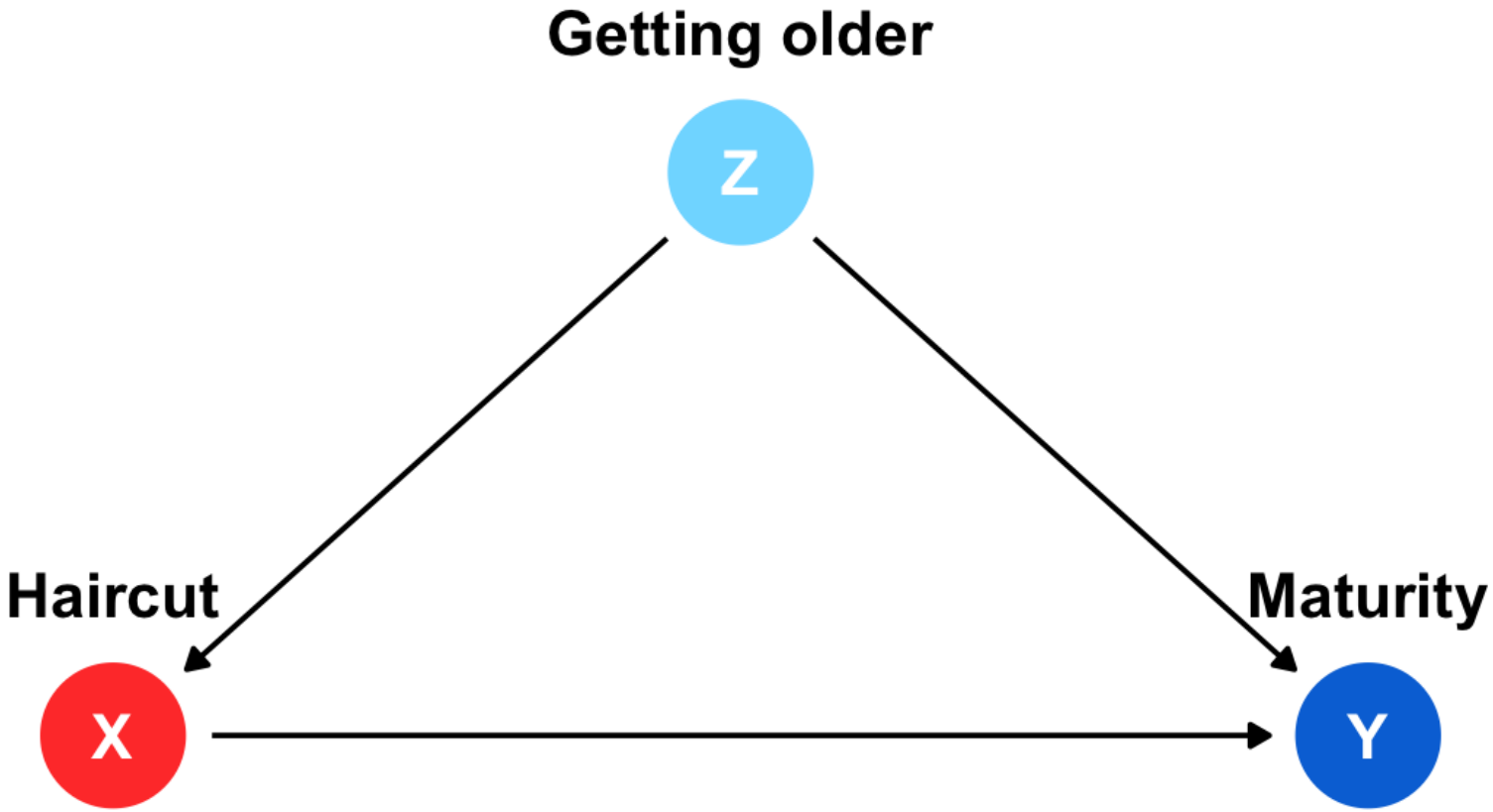
"Every time I get a haircut, I become more mature!"

"Every time I get a haircut, I become more mature!"



$$E[\text{Maturity} \mid \text{do}(\text{Get haircut})]$$

Getting older opens a backdoor path

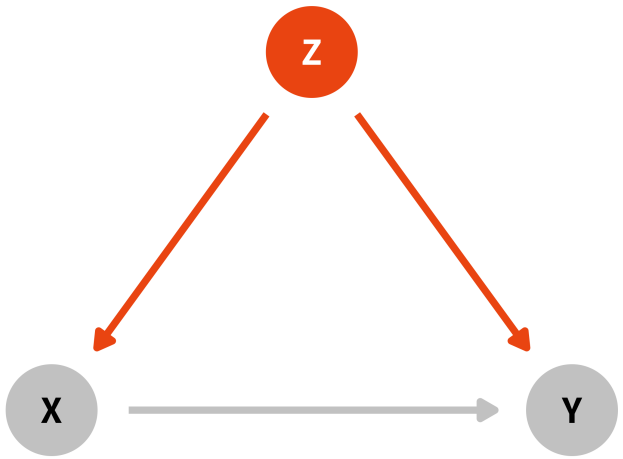


But what does that mean, "opening a backdoor path"?

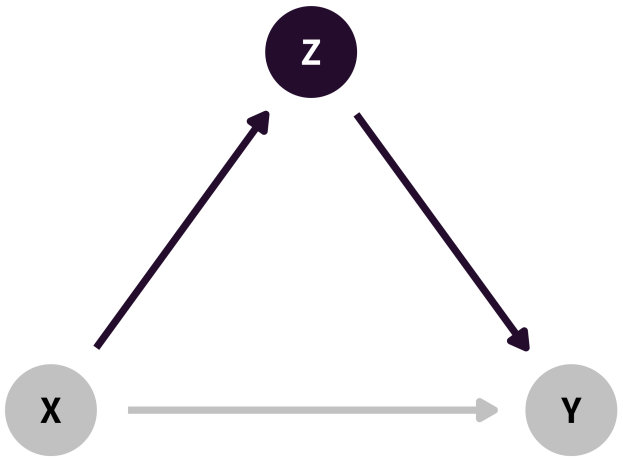
How does statistical association get passed through paths?

How do I know which of these is which?

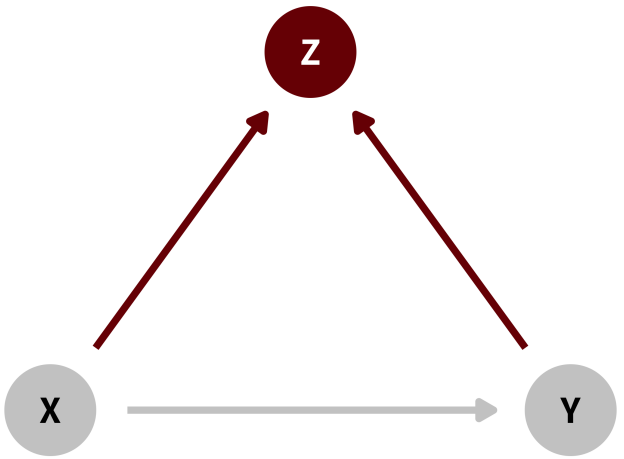
Confounder
(Fork)



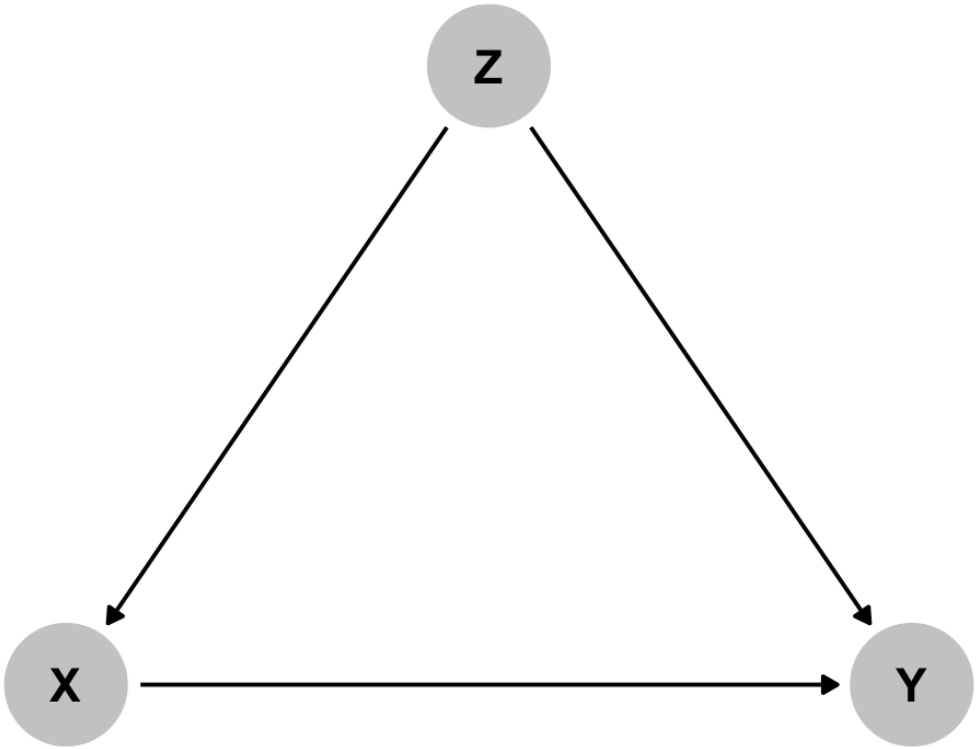
Mediator
(Chain)



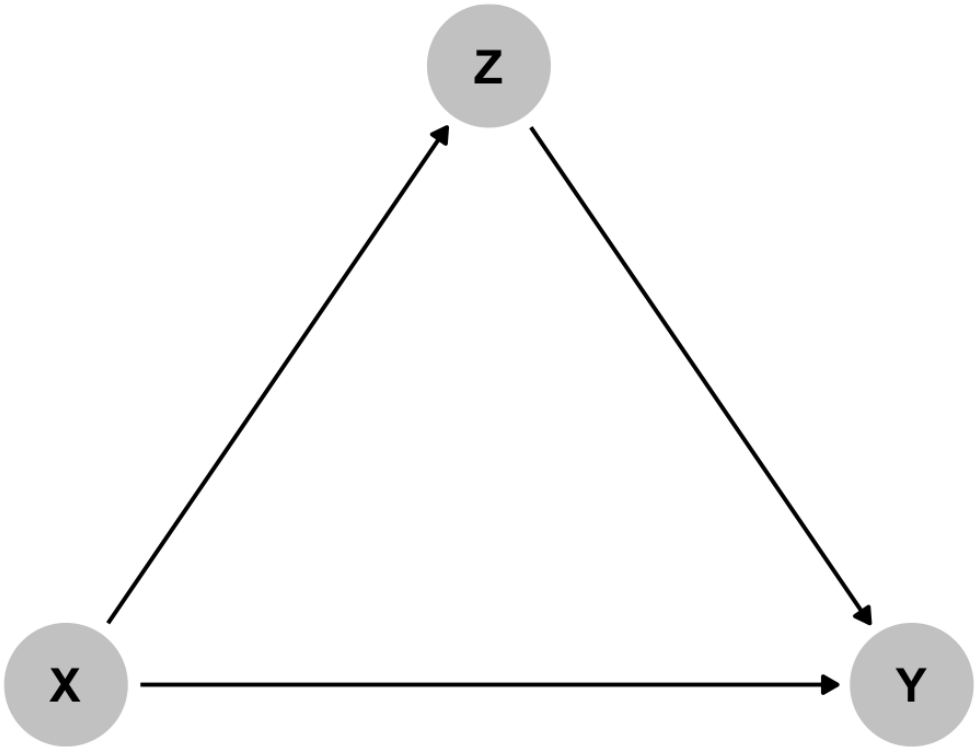
Collider
(Inverted fork)



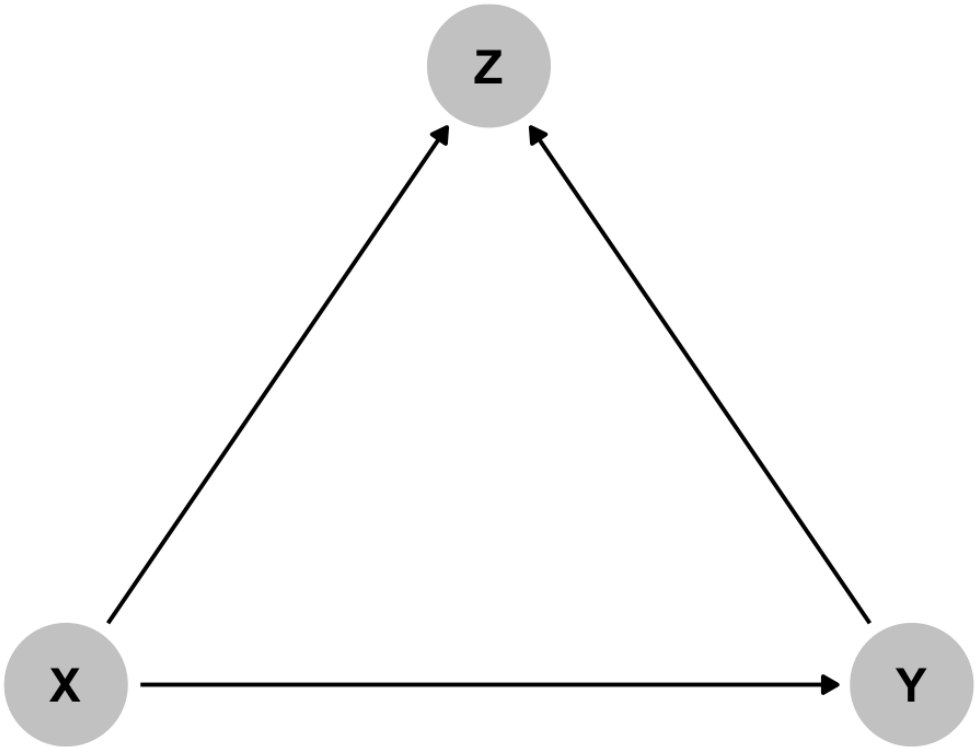

LUTRON


Z
X
Y


LUTRON


Z
X
Y


LUTRON


Z
X
Y

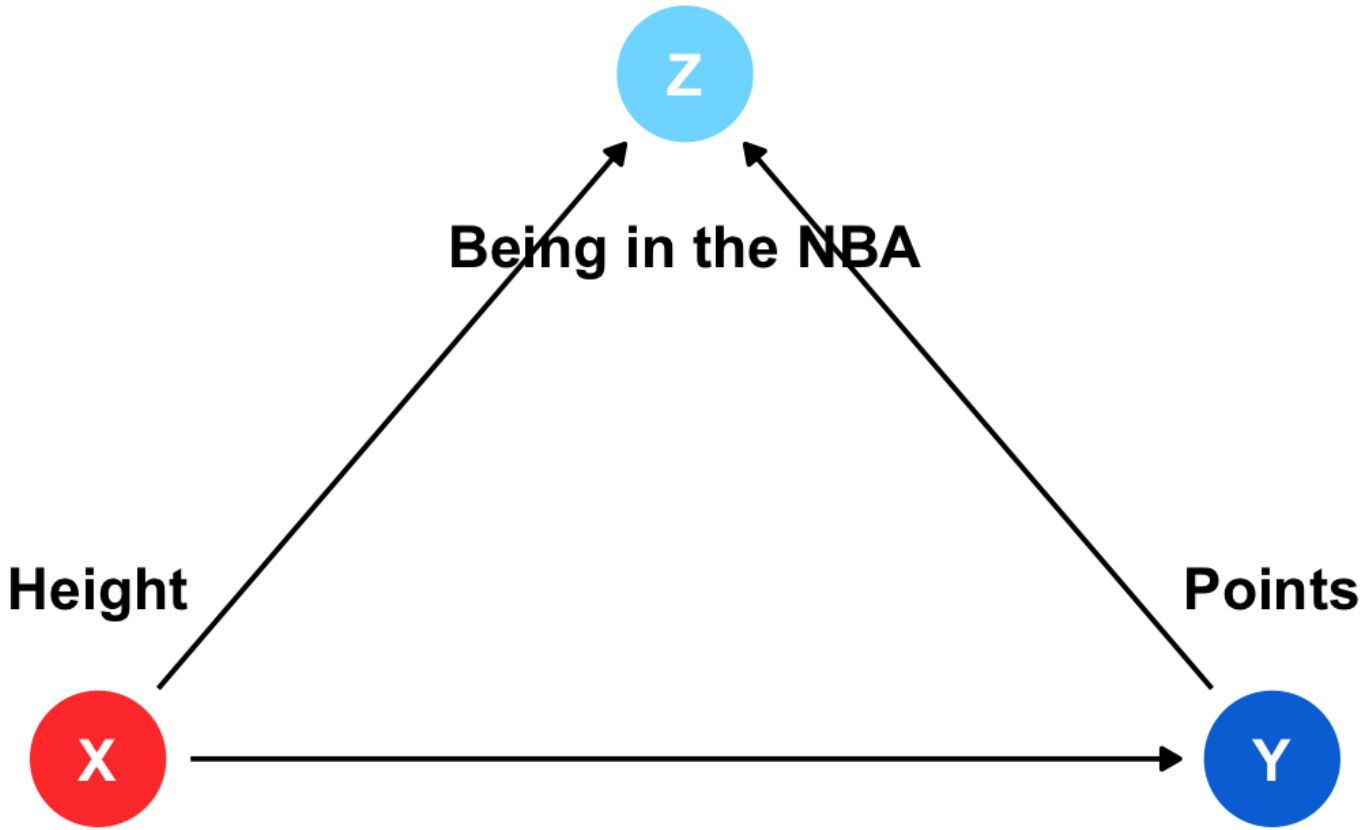
d-separation

Except for the one arrow between X and Y,
no statistical association can flow between X and Y

This is **identification**—
all alternative stories are ruled out
and the relationship is isolated

How exactly do colliders mess up your results?

It looks like you can still get the effect of X on Y

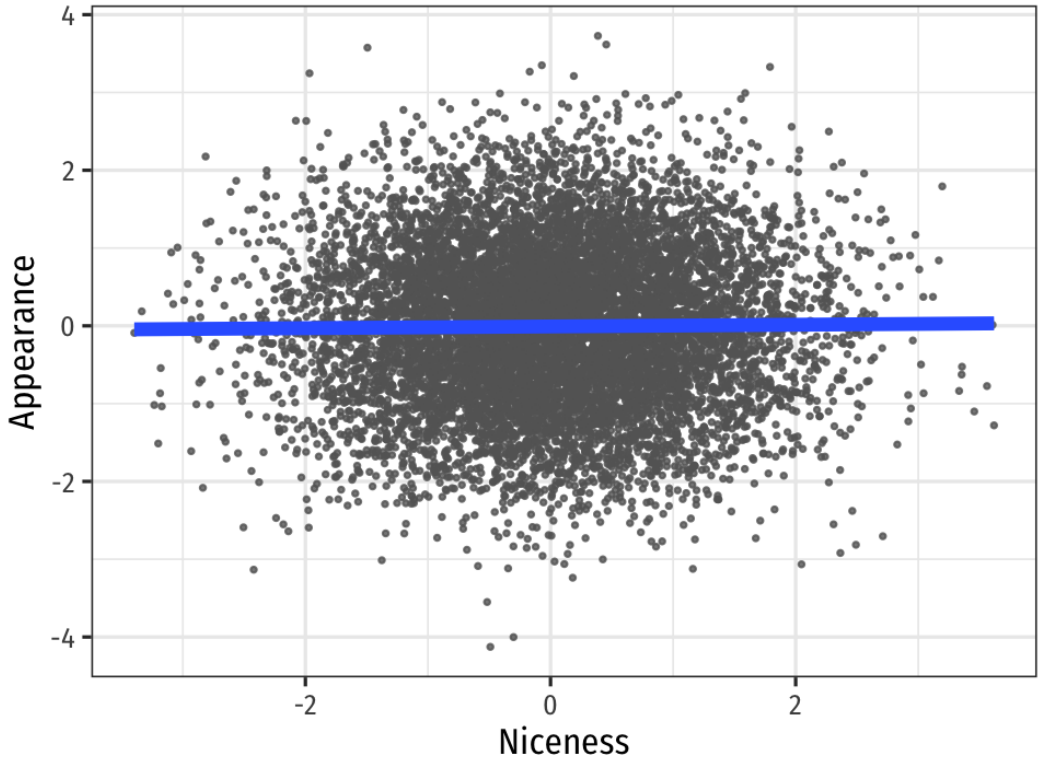

Z
Being in the NBA
Height
Points
X
Y

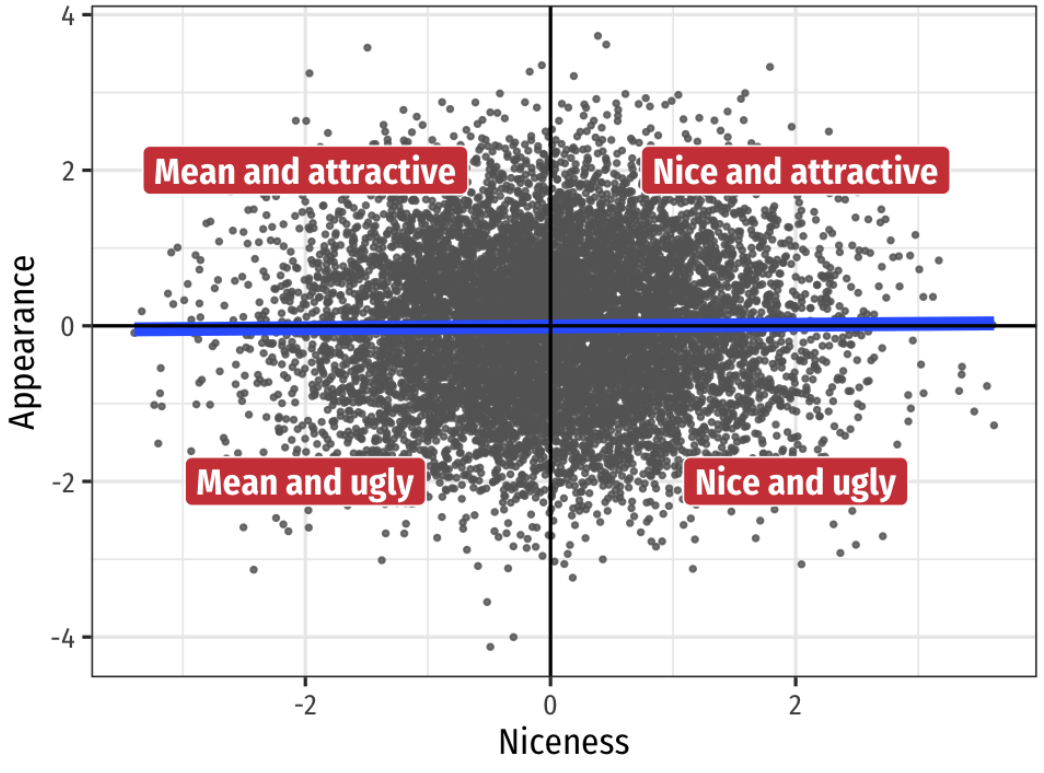
Sept. 10, 2021, 3:58 p.m. ET
By Davey Alba

Facebook sent flawed data to misinformation researchers.

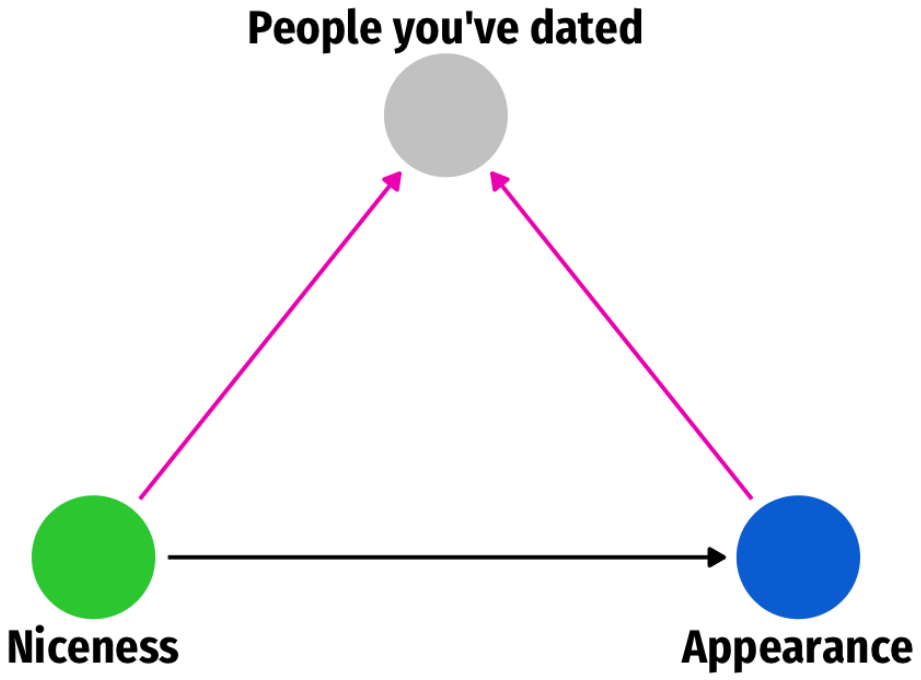
Mark Zuckerberg, chief executive of Facebook, testifying in Washington in 2018. Tom Brenner/The New York Times

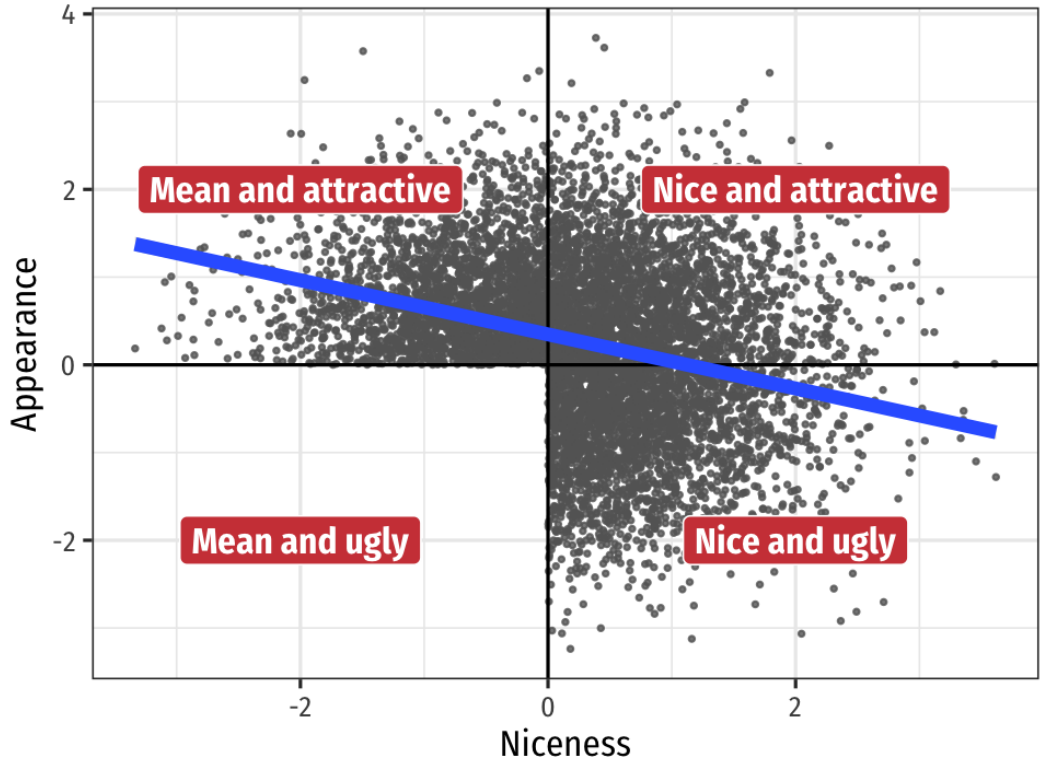
Does niceness improve appearance?





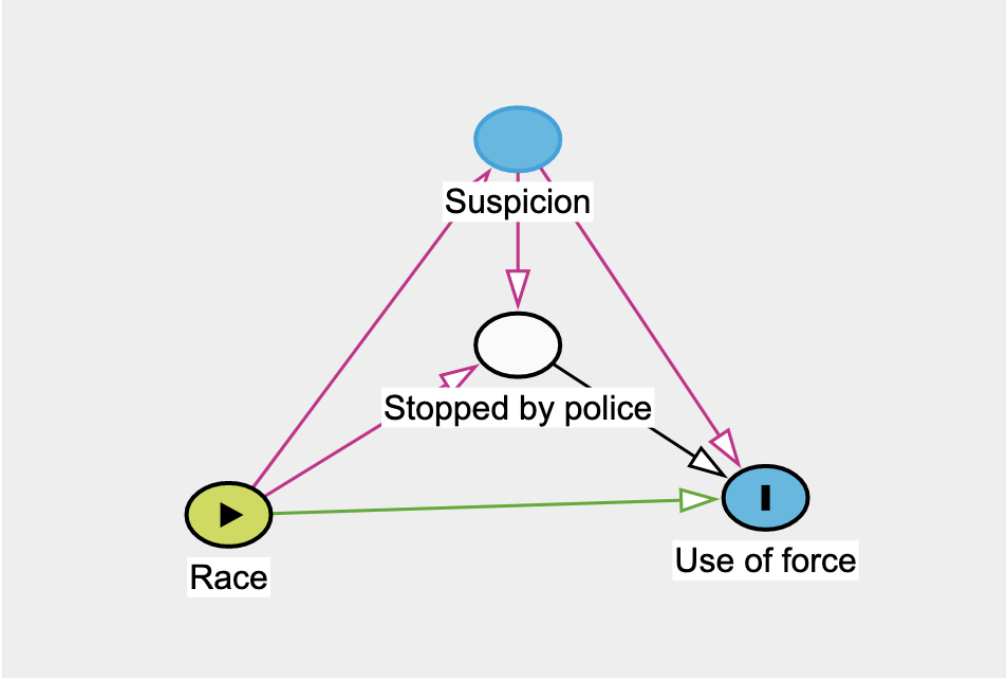
Collider distorts the true effect!





Effect of race on police use of force using administrative data

Effect of race on police use of force using administrative data



American Political Science Review, Page 1 of 19
doi:10.1017/S0003055420000039

Administrative Records Mask Racially Biased Policing

DEAN KNOX *Princeton University*
WILL LOWE *Hertie School of Governance*
JONATHAN MUMMOLO *Princeton University*

Researchers often lack the necessary data to credibly estimate racial discrimination in policing. In particular, police administrative records lack information on civilians police observe but do not investigate. In this article, we show that if police racially discriminate when choosing whom to investigate, analyses using administrative records to estimate racial discrimination in police behavior are statistically biased, and many quantities of interest are unidentified—even among investigated individuals—absent strong and untestable assumptions. Using principal stratification in a causal mediation framework, we derive the exact form of the statistical bias that results from traditional estimation. We develop a bias-correction procedure and nonparametric sharp bounds for race effects, replicate published findings, and show the traditional estimator can severely underestimate levels of racially biased policing or mask discrimination entirely. We conclude by outlining a general and feasible design for future studies that is robust to this inferential snare.

Concern over racial bias in policing, and the public availability of large administrative data sets documenting police–civilian interactions, have prompted a raft of studies attempting to quantify the effect of civilian race on law enforcement behavior. These studies consider a range of outcomes including ticketing, stop duration, searches, and the use of force (e.g., Antonovics and Knight 2009; Fryer 2019; Ridgeway 2006; Nix et al. 2017). Most research in this area attempts to adjust for omitted variables that may correlate with suspect race and the outcome of interest. In contrast, this study addresses a more fundamental problem that remains even if the vexing issue of omitted variable bias is solved: the inevitable statistical bias that results from studying racial discrimination using records that are themselves the product of racial discrimination (Angrist and Pischke 2008; Elwert and Winship 2014; Rosenbaum 1984). We show that when there is any biased absent additional data and/or strong and untestable assumptions.

This study makes several contributions. We clarify the causal estimands of interest in the study of racially discriminatory policing—quantities that many studies appear to be targeting, but are rarely made explicit—and show that the conventional approach fails to recover any known causal quantity in reasonable settings. Next, we highlight implicit and highly implausible assumptions in prior work and derive the statistical bias when they are violated. We proceed to develop informative nonparametric sharp bounds for the range of possible race effects, apply these in a reanalysis and extension of a prominent article on police use of force (Fryer 2019), and present bias-corrected results that suggest this and similar studies drastically underestimate the level of racial bias in police–civilian interactions. Finally, we outline strategies for future data collection and re-

Smoking → Cardiac arrest example

How can you be sure you include everything in a DAG?

Is there a rule of thumb for the number of nodes?

Why do DAGs have to be acyclic?

What if there really is reverse causation?

How do we actually adjust for these things?

What's the difference between logic models and DAGs?

Can't I just remake my logic model in Dagitty and be done?

DAGs vs. Logic models

DAGs are a *statistical* tool

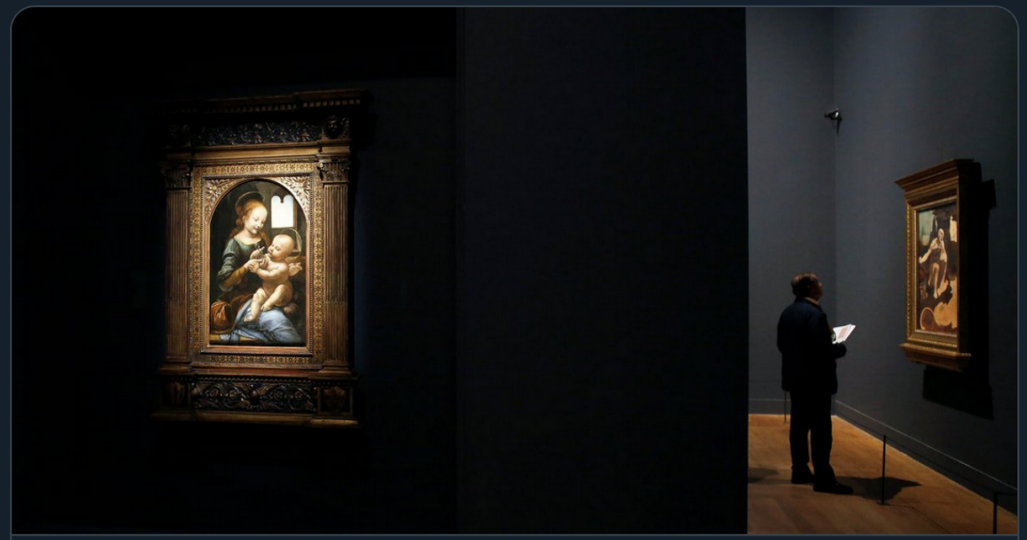
Describe a data-generating process and isolate/identify relationships

Logic models are a *managerial* tool

Oversee the inner workings of a program and its theory

NYT Health
@NYTHealth

Want to live longer? Try going to the opera. Researchers in Britain have found that people who reported going to a museum or concert even once a year lived longer than those who didn't.



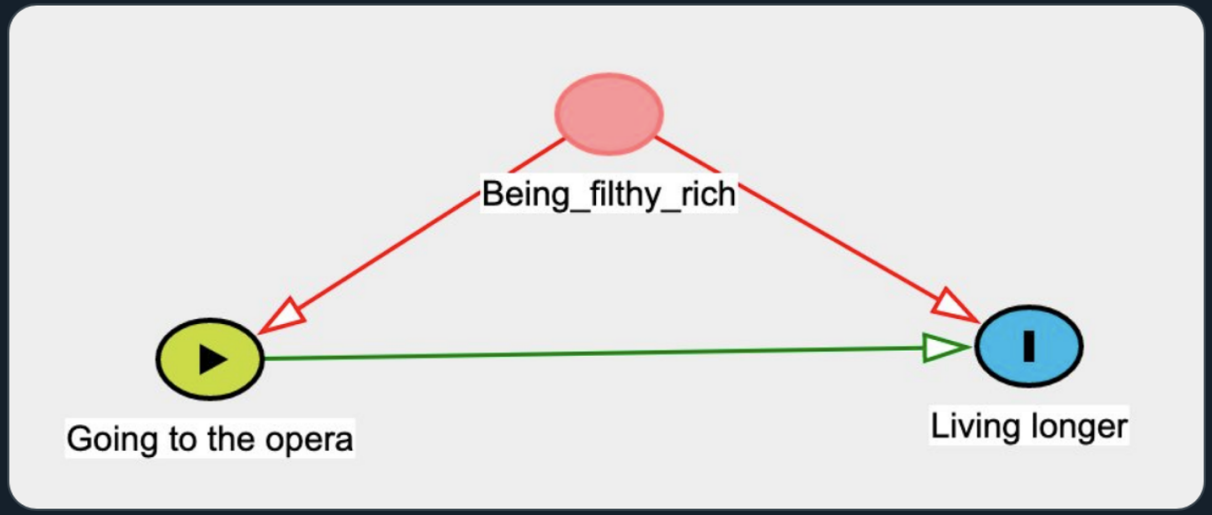
Another Benefit to Going to Museums? You May Live Longer
Researchers in Britain found that people who go to museums, the theater and the opera were less likely to die in the study period than those who didn't.
nytimes.com

9:19 AM · Dec 22, 2019 · SocialFlow

336 Retweets **1.3K** Likes

Andrew Heiss
@andrewheiss

ooh ooh i can draw the dag for this one!



> **NYT Health** @NYTHealth · Dec 22, 2019
> Want to live longer? Try going to the opera. Researchers in Britain have found that people who reported going to a museum or concert even once a year lived longer than those who didn't. nyti.ms/2Q9AmZV

2:47 PM · Dec 22, 2019 · Twitter Web App

View Tweet activity

837 Retweets **3.9K** Likes

Berkeley Will Fully Close Its Streets to Create Giant Outdoor Dining Rooms

3

Berkeley is moving fast to expand outdoor dining

by Eve Batey | May 14, 2020, 1:02pm PDT

SHARE

How cities can add accessible green space in a post-coronavirus world

June 11, 2020 3.40pm EDT

Cities can prepare for climate change emergencies by adding green spaces to help manage stormwater, heat stress and air quality. (Shutterstock)

The COVID-19 pandemic has forced governments to weigh the benefits of keeping green spaces open against the public health concerns that come from their use. During the pandemic, playgrounds have been taped off, parks locked and access to outdoor spaces for recreation cut off.

Green spaces have positive effects on mental health, physical fitness, social cohesion and spiritual wellness. Although researchers say the coronavirus spreads more easily indoors than outdoors, they also believe the concentrated use of green spaces will increase the transmission of COVID-19.

Authors

Ryan Plummer
Professor, Environmental Sustainability Research Centre, Brock University

Darby McGrath
Adjunct professor, Environmental Sustainability Research Centre, Brock University

Sivajanani Sivarajah
Research Associate, Department of Architectural Science, Ryerson University