Statistical Modeling and Causal Inference with R

Week 6: Matching

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Lecture Q&A

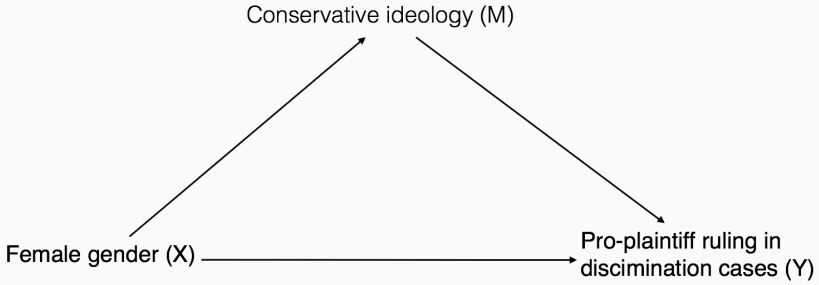
- ✓ Open Q&A
- ✓ Boyd, Epstein, Martin (2010)

Boyd, Epstein, Martin (2010)

1. What is the research question?
2. Why does the effect of the having a female judge on a panel lend itself to causal analysis, but not the effect of the sex of the judge herself? (And should the second question hence not be studied?)
3. What is the role of ideology in what the authors call a) individual effects, and b) panel effects? Draw DAG, and explain.
4. Is there an issue with common support?
5. Which covariates do the authors control for/match on, and why? Is their strategy appropriate? Given the argument, what effect would you expect matching to have?

Boyd, Epstein, Martin (2010): Ideology and the DAG

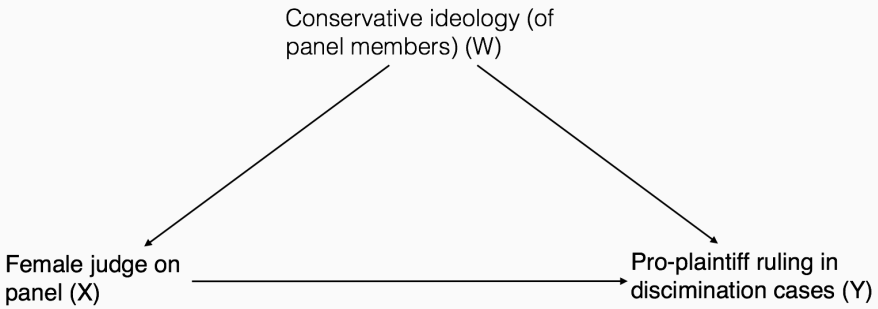
'Individual effect'



In 'individual effect', ideology is mediator!

Boyd, Epstein, Martin (2010): Ideology and the DAG

'Panel effect'

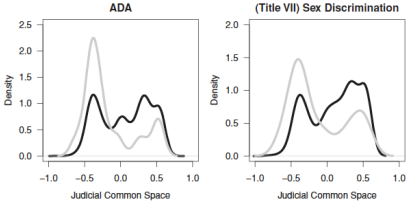


In 'panel effect', ideology may be confounder

Boyd, Epstein, Martin (2010): Common support

Is there a lack of common support with regard to ideology?

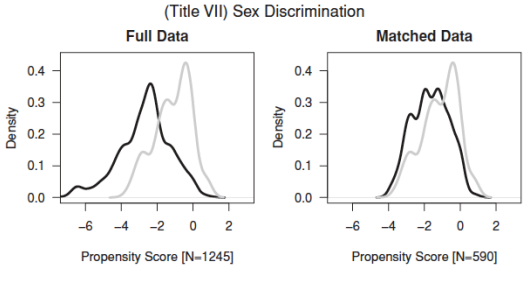
FIGURE 1 The Ideology of U.S. Court of Appeals Judges Who Voted in Title VII Sex Discrimination and Americans with Disabilities Act (ADA) Cases



Each panel displays a kernel density plot that depicts the marginal distribution of ideology (measured using the Judicial Common Space), from most liberal to most conservative, of the participating U.S. Court of Appeals judges. The black line represents male judges and the grey line represents female judges. Case data come from Sunstein et al. (2006) and ideology, from Epstein et al. (2007).

Boyd, Epstein, Martin (2010): Common support

Figure demonstrating lack of common support



The black lines depict the density for all-male panels (control); the grey lines for mixed-sex panels (treatment). Each left-hand panel represents the full datasets while the right-hand panels display the propensity scores for only the matched data.

Boyd, Epstein, Martin (2010): Choosing controls

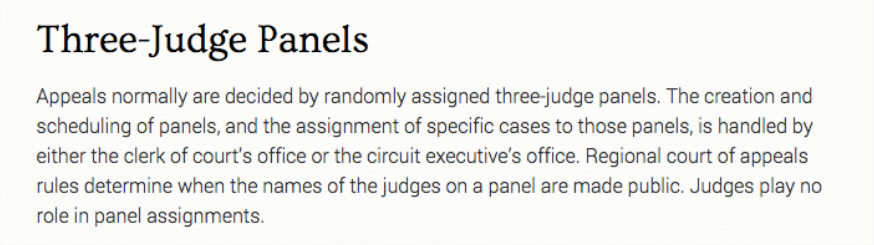
How should we determine which variables to control for? Is the the following selection warranted?

- ✓ ideology
- ✓ year of birth
- ✓ ideology
- ✓ minority judge
- ✓ judicial experience
- ✓ circuit dummies

Do these variables shut possible back doors? Do they reflect the assignment process? What variables would?

Boyd, Epstein, Martin (2010): Choosing controls

Panel assignment procedure for appellate courts



Three-Judge Panels

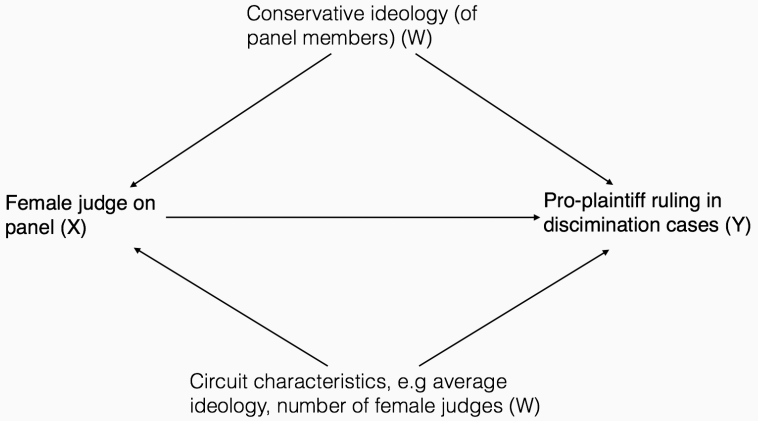
Appeals normally are decided by randomly assigned three-judge panels. The creation and scheduling of panels, and the assignment of specific cases to those panels, is handled by either the clerk of court's office or the circuit executive's office. Regional court of appeals rules determine when the names of the judges on a panel are made public. Judges play no role in panel assignments.

https://www.uscourts.gov/statistics-reports/appellate-courts-and-cases-journalists-guide#panels

Given this assignment procedure, what would you control for/match on? And would you expect matching and multivariate regression estimates to differ?

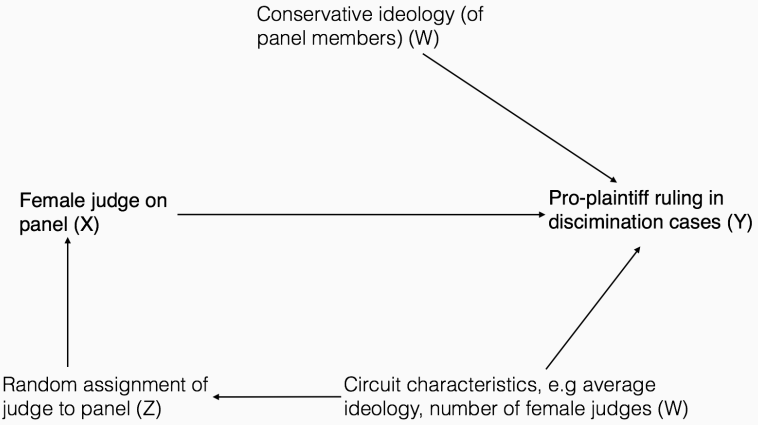
Boyd, Epstein, Martin (2010): Choosing controls

'Panel effect': authors' model



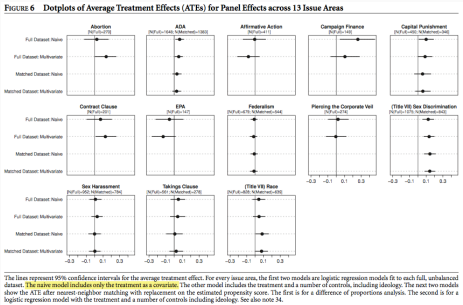
Boyd, Epstein, Martin (2010): Choosing controls

'Panel effect': alternative model considering assignment process



Boyd, Epstein, Martin (2010): Choosing controls

Results: compare regression and matched results



Results: 1. Naive model, 2. full controls, 3. PS, 4. PS with controls

Given judges are assigned at random to panels, no big differences to be expected; most important effect probably from matching on circuit fixed effects, which the regression models do not control for

Boyd, Epstein, Martin (2010): Choosing controls

Matching as a valuable pre-analysis procedure

> [34]In a few instances, we found that the unmatched data were sufficiently balanced. For these datasets (abortion, affirmative action, campaign finance, Contract Clause, EPA, and piercing the corporate veil) we only report average treatment effects for the unmatched data. Note, though, that only after estimating propensity score models and comparing the summary statistics across models were we able to come to the conclusion that we could appropriately analyze these datasets without matching observations.

Thank you for watching, and see you next Monday!

References i

Boyd, C. L., Epstein, L., & Martin, A. D. (2010). Untangling the Causal Effects of Sex on Judging. *American Journal of Political Science*, *54*(2), 389–411.