

Learning About Police Bias:

How Monitoring Police Changes Prosecutors' Beliefs and Decisions

Emma Harrington
University of Virginia

Hannah Shaffer
Harvard Law School

Discrimination in Sequential Systems

Decision-makers often rely on information from earlier actors:

- **Labor market:** Interviewer → Hiring Manager
- **Peer Review:** Referee → Editor
- **Criminal justice system:** Police → Prosecutor

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What happens to downstream actors' beliefs and choices when they can **monitor earlier actors**?

This Paper: Prosecutors and Police

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 - **Design:** staggered adoption of police body worn cameras (BWCs)

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 - **Design:** staggered adoption of police body worn cameras (BWCs)
- ② **Test how exposure to BWC footage shapes prosecutors' beliefs**
 - Conduct an original survey of ≈ 200 prosecutors and link responses to their half-million cases

Preview of Results

BWCs reduce racial disparities in arrests, by reducing low-level arrests

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- ▶ **Origins of Biased Beliefs.** Suggestively come from prosecutors accepting police reports as "all there is"

Contributions

① Monitoring

- Focused on impacts on *those being monitored*
 - On worker productivity and morale (e.g., [Nagin et al., 2002](#); [Gosnell et al., 2020](#); [Adhvaryu et al., 2024](#))
 - On politician corruption (e.g., [Olken, 2007](#); [Bobonis et al., 2016](#))
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- **We model and measure causes of pass through.**

Roadmap

- 1 Data
- 2 Background & Interviews
- 3 Bodyworn Camera Adoption
- 4 Prosecutor Survey
 - Inaccurate Beliefs
 - Origins of Biased Beliefs

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③ Survey of prosecutors in 2020

- 16 participating offices, total of 203 prosecutors who handled a half-million cases

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Use of BWC Footage

Footage almost always exists in cases with police arrests

- 93% of cases in Chicago (Jordan et al., 2025)

Footage is almost always watched

- Either "nail down the person's guilt" or is "disastrous to my case"

Learning what happened in a specific case

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The cop said there was weaving, but then you see the video and think, 'Where's the weave?' The person looks like he's just driving around a turn, and you think, 'I did that on the way to work this morning.'

— NC judge

Learning what happened in a specific case

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Learning the cop lacked probable cause or used excessive force:

An officer justified a search by claiming the suspect was “making furtive movements”, but in the footage, “the guy was just sitting there.”
— NC prosecutor

Learning about red flags in all of their cases

Prosecutors report more skepticism of stops & searches based on:
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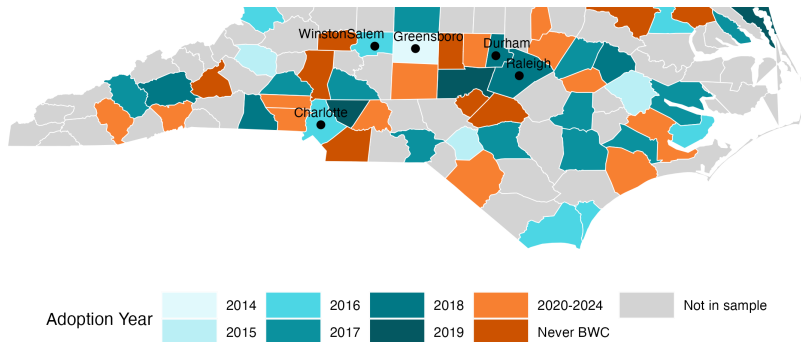
Also learned about signals of police use – or misuse – of force:

You learn which language to be skeptical of. It's passive language like 'the defendant was assisted to the ground and placed in handcuffs' . . . anodyne stuff. . . language that's functionally state violence. It makes me think, 'three officers brought him to the ground.'
— NC prosecutor

Roadmap

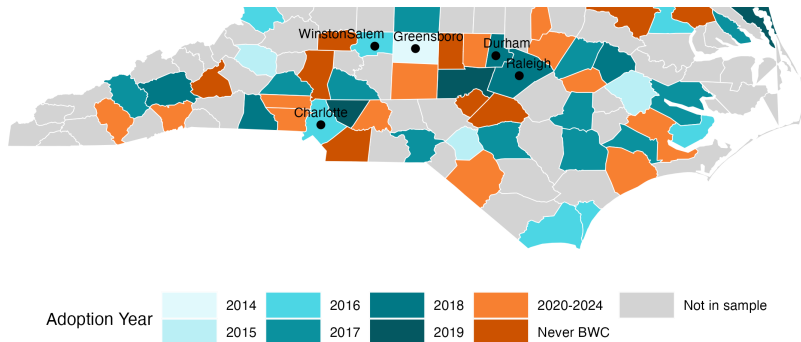
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Staggered Adoption of BWC



► Know timing for 77% of sample

Staggered Adoption of BWC



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- Similar baseline arrest & incarceration rates [→](#)

Estimating Effects of Bodyworn Cameras

Difference-in-differences:

$$\text{Per Capita Arrest}_{c,t} = \beta \text{ Adopted BWC}_{c,t} + \mu_c + \mu_t + \nu_{c,t}$$

where c is county and t is year

We use a **stacked DiD** to limit the control group to not-yet-treated counties but show robustness to other estimators.

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- Debate over *when* and *how to finance*, not *whether*, to adopt

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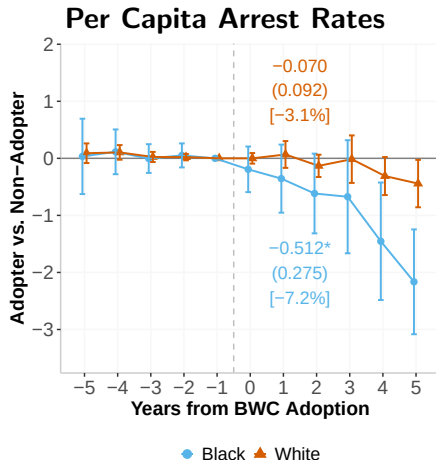
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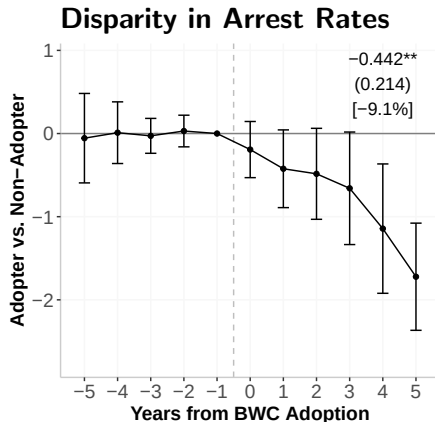
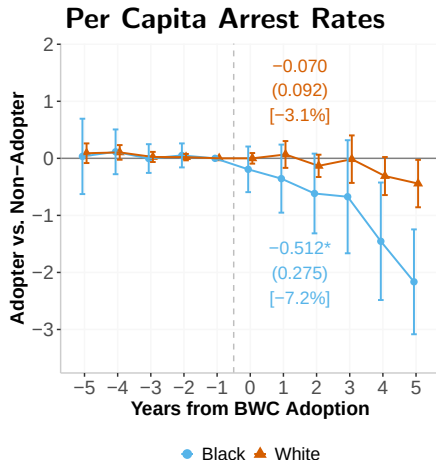
Local news & city council meetings show...

- Debate over *when* and *how to finance*, not *whether*, to adopt
 - Funding often came from federal gov
 - Avg lag of 2 years between initial discussion & roll-out

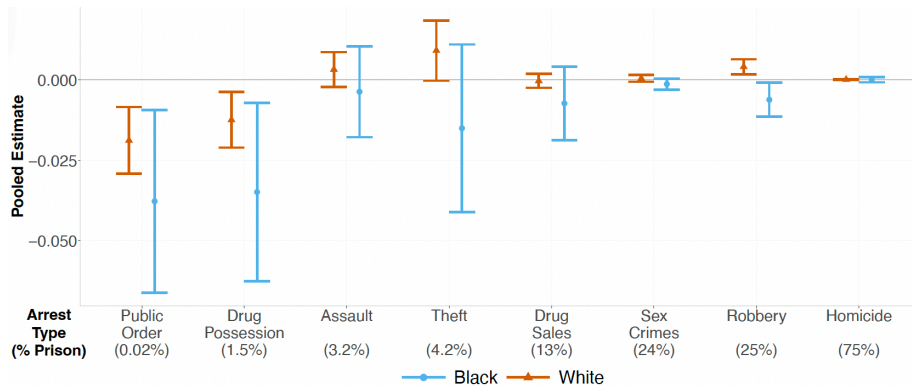
Change in Per Capita Arrests

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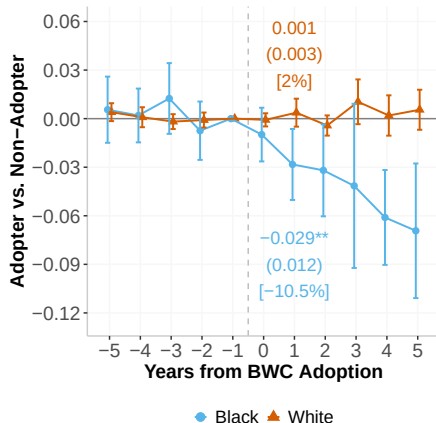
Effects Concentrated in Low-Level Arrests



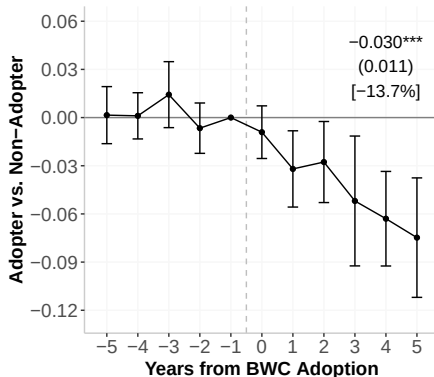
Effects Extend Beyond Arrest to Incarceration

[Conviction and Jail ⇒](#)

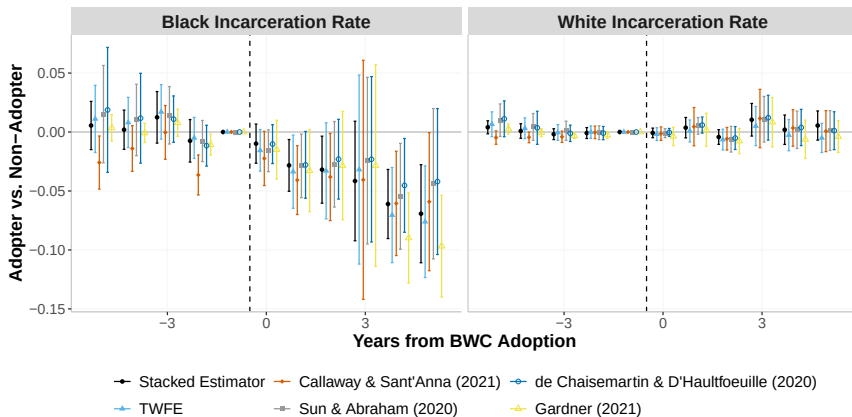
Per Capita Incarceration Rates



Disparity in Incarceration Rates



Incarceration with Alternative Estimators



Omit counties that

never adopt ⇒

elect a new sheriff ⇒

use local funds ⇒

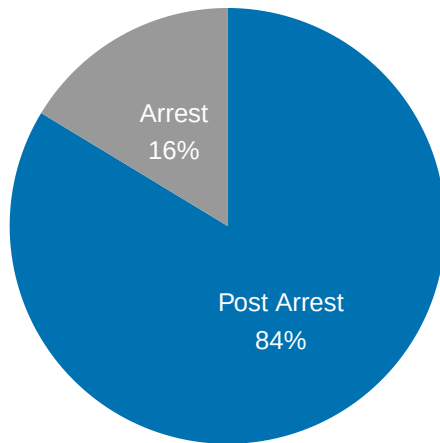
neighbor a treated cty ⇒

Balance in cty & prosecutor traits ⇒

Broadly hold across 26 adopters ⇒

Worst-case trends (Roth, 2022) ⇒

Oaxaca Blinder Decomposition of Incarceration



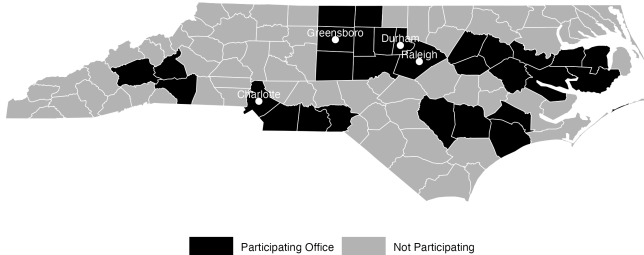
Prosecutors play a big role in mediating BWCs' effects on incarceration

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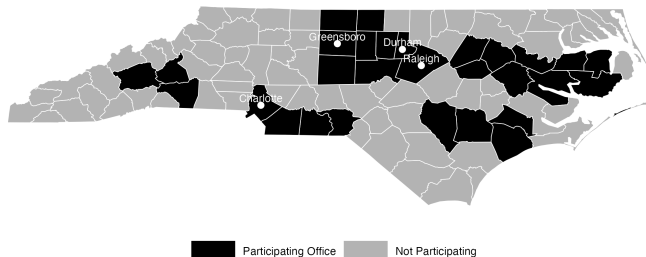
Prosecutor Survey

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Handled 505,787 cases between 1995 and 2019

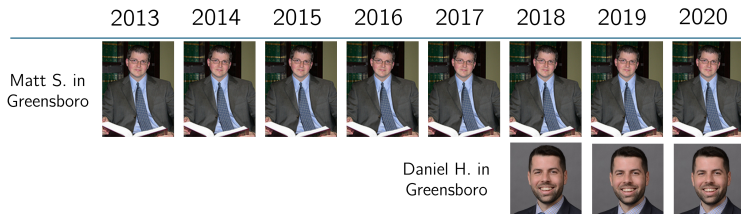
[Survey Representativeness](#) ⇒

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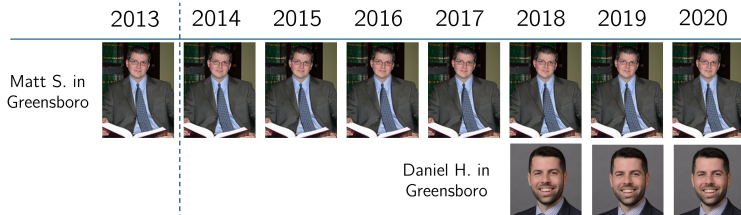
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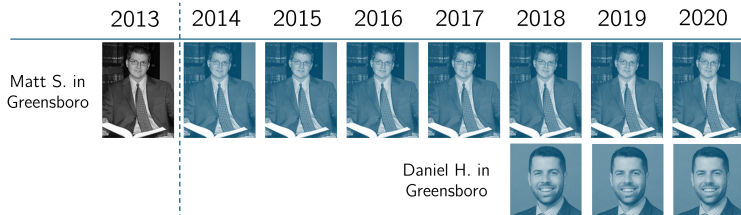
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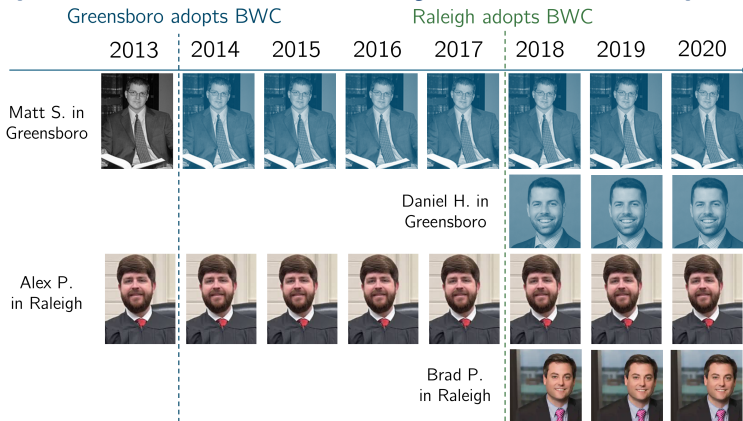


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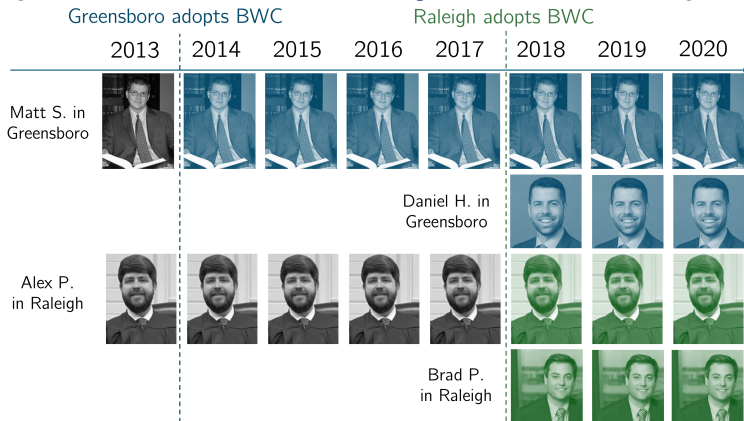
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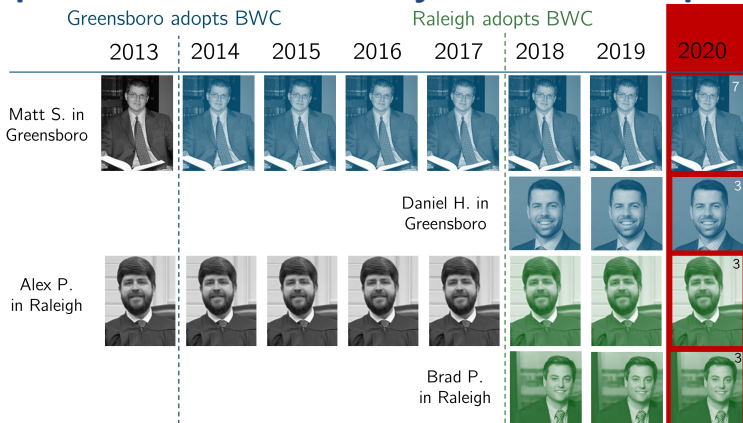
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$$\text{Belief}_p = \phi \text{Years with BWC}_p + \mu_{c_p} + \mu_{\tau_p} + u_p$$

where c is county and τ , is tenure; ID: Parallel tenure trends $\Rightarrow$

Exposure to BWC & Beliefs about Disparities

Modeled off General Social Survey

- Present facts about disparities
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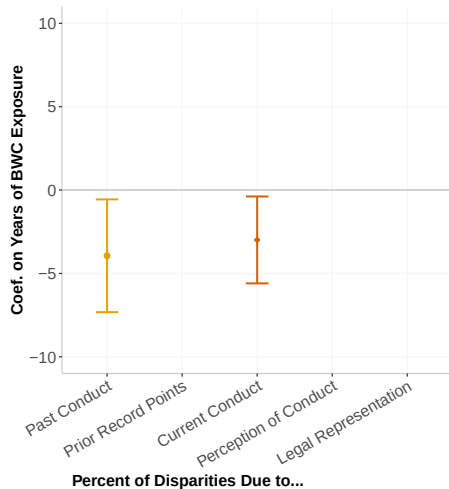
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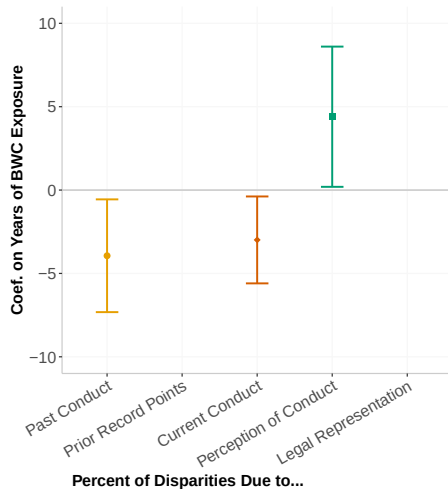
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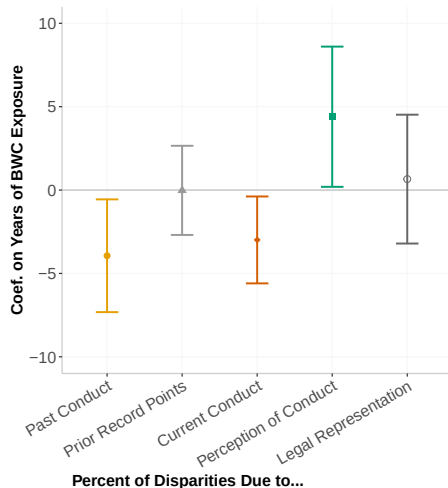
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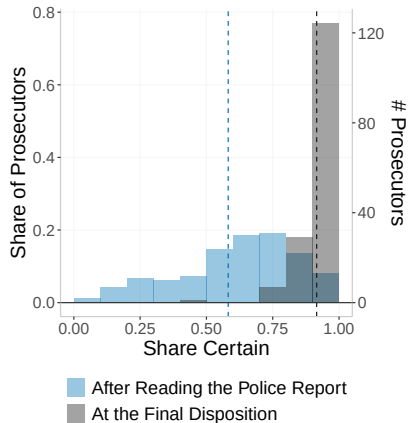
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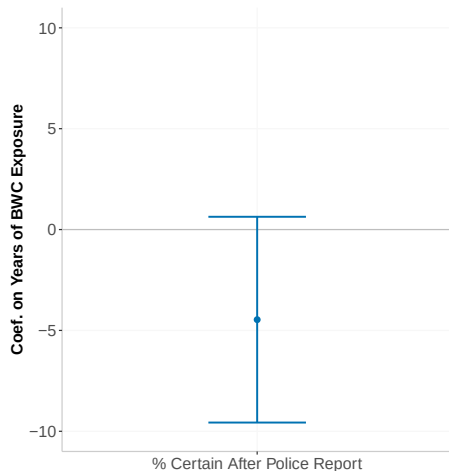
Weakly correlated with prosecutor traits →



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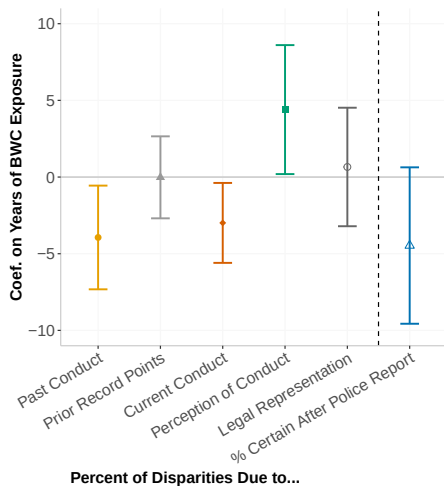
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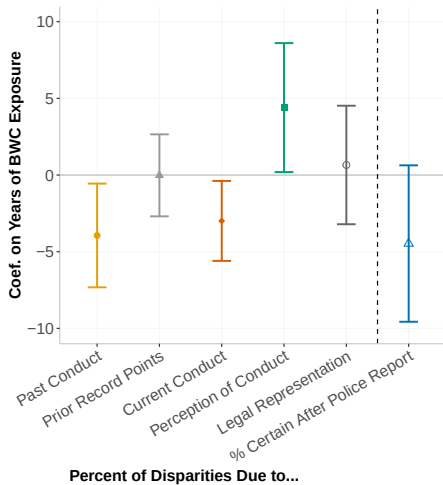
Exposure to BWC & Beliefs

Beliefs on Survey



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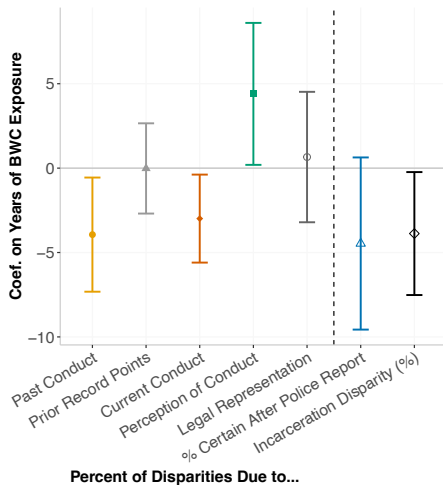


Robustness:

Prosecutor Selection:

- Similar turnover before vs. after BWC adoption ⇒
- No change in prosecutor racial or political composition around adoption ⇒
- Similar shift in beliefs with controls for race and politics ⇒

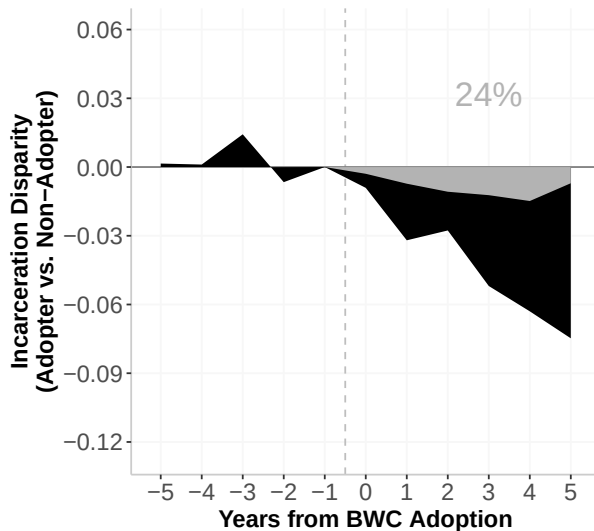
Exposure Design for Incarceration Disparities



Prosecutors with one more year of BWC exposure reduce incarceration disparities by **0.3 pp** or **4%** of Black defendants' incarceration rate

Back-of-the-Envelope Contribution to BWCs' Effects

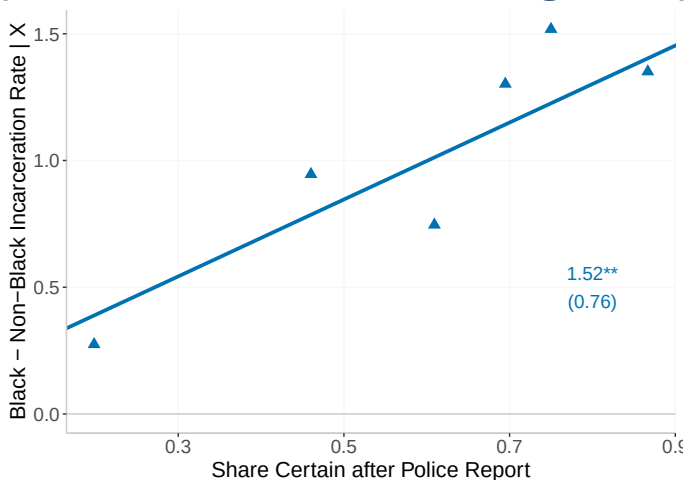
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Taking reports at face value linked to higher disparities

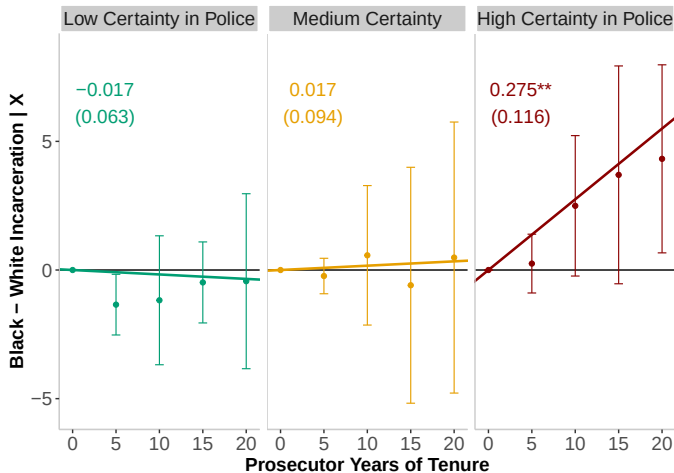


Rotational assignment in crime units (e.g., drug crimes)

[Balance →](#)

[Mover Validation →](#)

Increasingly so with tenure



Conclusion

Staggered adoption of BWC introduces monitoring of earlier actors

- Reduces disparities in low-level arrests
- Reduces incarceration rates for Black people
 - >80% of which can't be explained by extensive margin of arrest

Survey lets us unpack behavioral mechanisms

- Receiving objective information can change prosecutors' minds
- Suggestively beliefs were biased by taking earlier reports at face value

Thank You!

emma.k.harrington4@gmail.com or hshaffer@law.harvard.edu

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Beliefs → Prosecutors' Disparate Impacts



Rotational Assignment in
crime units (e.g., drug crimes or
SVU)

Balance →

Mover Validation →

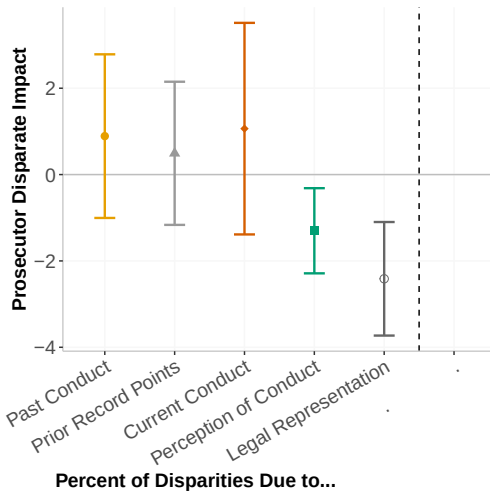
Beliefs → Prosecutors' Disparate Impacts



Rotational Assignment in
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SVU)

[Balance →](#)

[Mover Validation →](#)



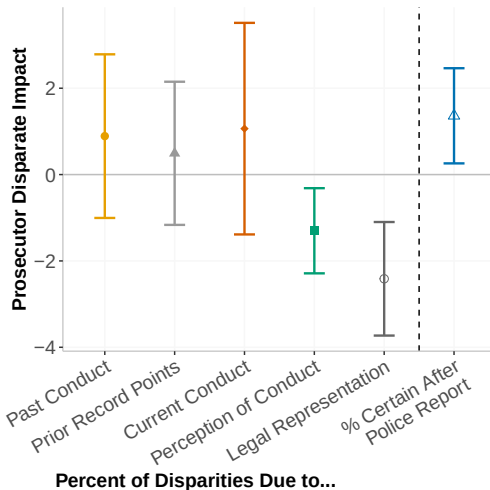
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Beliefs → Prosecutors' Disparate Impacts



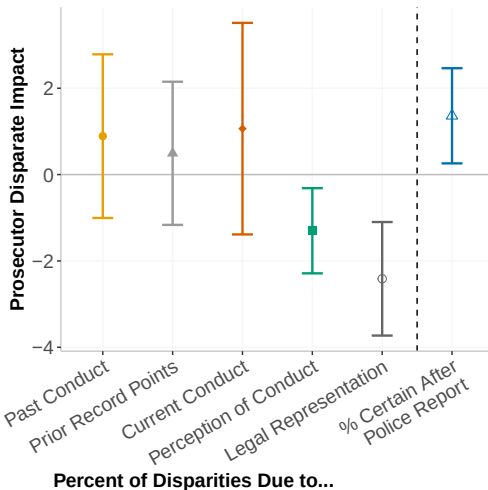
Rotational Assignment in crime units (e.g., drug crimes or SVU)

Balance →

Mover Validation →

Back-of-Envelope calculation:

- Multiply each relationship by change in belief
 - Sum up
- Disparities fall by 0.2 pp per year of exposure



Test of internalizing police reports

$$\begin{aligned}
 \text{Incarceration}_i = & \omega \text{ Black}_i \times \text{Share Certain}_{p(i)} \times \text{Tenure}_{p(i),t(i)} \\
 & + \delta \text{ Black}_i \times \text{Tenure}_{p(i),t(i)} \\
 & + \gamma \text{ Share Certain}_{p(i)} \times \text{Tenure}_{p(i),t(i)} \\
 & + \tau \text{ Tenure}_{p(i),t(i)} + \mu_{p(i),\text{Black}_i} + \mu_{\text{unit}(i)} + X_i' \gamma + v_i
 \end{aligned}$$

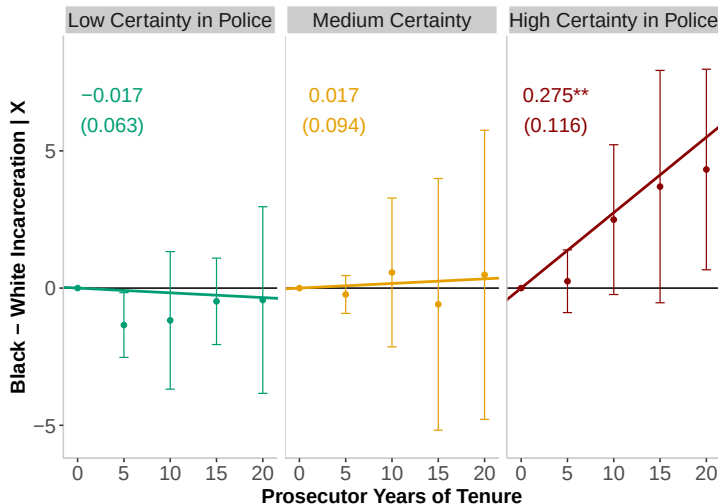
More certain prosecutors increase disparities with tenure



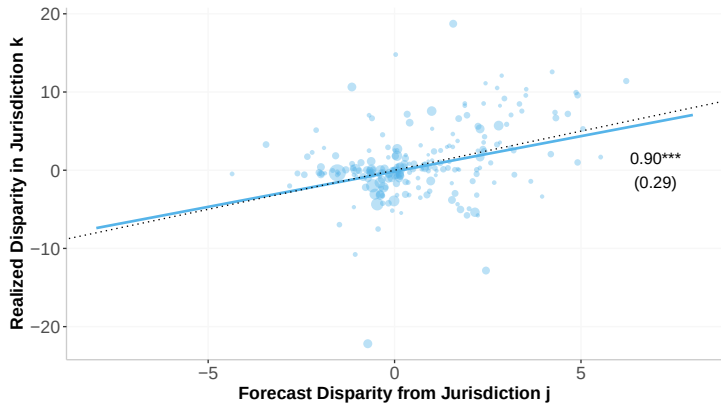
$$\begin{aligned}
 \text{Incarceration}_i = & 0.64^{***} \text{Black}_i \times \text{Share Certain}_{p(i)} \times \text{Tenure}_{p(i),t(i)} \\
 & - 0.27^{***} \text{Black}_i \times \text{Tenure}_{p(i),t(i)} \\
 & - 0.07 \text{Share Certain}_{p(i)} \times \text{Tenure}_{p(i),t(i)} \\
 & - 0.06 \text{Tenure}_{p(i),t(i)} + \mu_{p(i),\text{Black}_i} + \mu_{\text{unit}(i)} + X_i' \hat{\gamma}
 \end{aligned}$$

Table with robustness to alternative specs $\Rightarrow$

More certain prosecutors increase disparities with tenure



Movers



Summary Statistics

In Pre-BWC Years (2010-13) ⇒



	BWC Adoption Year			
	Early (2014-16) (1)	Middle (2017-19) (2)	Late (2020-24) (3)	Never (—) (4)
Per Capita Outcomes				
% Arrested	3.41	2.94	3.42	2.68
Black	6.60	6.59	6.78	6.20
White	2.14	1.94	2.71	2.07
% Incarcerated	0.11	0.11	0.11	0.10
Black	0.28	0.32	0.29	0.31
White	0.05	0.06	0.08	0.06
County Characteristics				
% Black	28.5	24.2	19.8	16.2
% Urban (2010 Census)	78.6	68.2	48.8	32.7
% County Voters Reg. Democrat	40.3	39.1	35.4	28.8
Prosecutor Demographics				
% Black Prosecutor	9.8	9.5	8.4	6.1
% Registered Democrat	41.6	49.9	46.1	37.9
# Cases	1,055,078	1,093,464	593,515	207,457
# Counties	9	17	14	8

Summary Statistics

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Summary Statistics Pre-BWC 2010-13



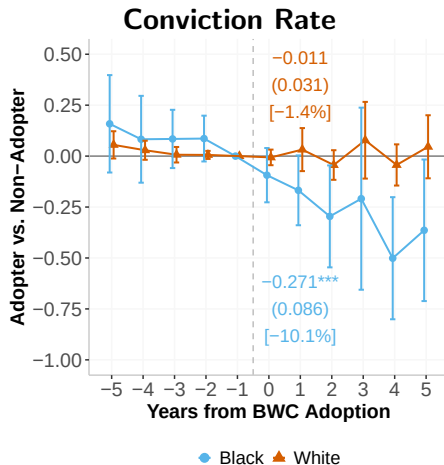
	BWC Adoption Year					
	Full Sample (1)	BWC Sample (2)	Early (2014-16) (3)	Middle (2017-19) (4)	Late (2020-24) (5)	Never (—) (6)
Per Capita Outcomes						
% Arrested	4.23	4.23	4.58	3.85	4.52	3.69
Black	8.71	8.68	8.76	8.60	8.83	8.20
White	2.99	2.88	2.89	2.53	3.59	2.86
% Convicted	1.58	1.56	1.54	1.55	1.71	1.31
Black	3.54	3.49	3.27	3.74	3.52	3.21
White	1.06	0.99	0.86	0.97	1.31	0.98
% Incarcerated	0.12	0.12	0.12	0.12	0.12	0.11
Black	0.33	0.33	0.31	0.35	0.32	0.34
White	0.07	0.06	0.05	0.06	0.08	0.07
County Characteristics						
% Black	23.3	24.4	28.5	24.2	19.2	16.8
% Urban (2010 Census)	59.1	66.9	79.3	68.9	49.5	31.6
% County Voters Reg. Democrat	37.4	38.4	40.3	39.3	35.2	29.6
Prosecutor Demographics						
% Black Prosecutor	9.1	8.9	9.7	9.5	8.3	2.2
% Female Prosecutor	39.4	38.3	34.4	37.1	42.2	54.1
% Registered Democrat	41.7	45.9	42.4	50.5	51.1	29.0
Prosecutor Age (in Years)	41.0	40.3	40.0	39.3	42.1	40.0
Prosecutor Tenure (in Years)	3.6	3.6	3.7	3.4	3.6	3.4
# Cases	1,465,912	1,148,992	425,644	440,612	213,612	69,124
# Prosecutors	1,721	1,462	511	617	362	194
# Offices	39	33	8	14	12	7
# Counties	100	48	9	17	14	8

Evidence of internalizing police reports



	% Incarcerated >6mo						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Prosecutor Tenure x Share Certain x Black	0.66*** (0.10)	0.72*** (0.09)	0.64*** (0.14)	0.52*** (0.17)	0.50*** (0.16)	0.51*** (0.08)	0.56*** (0.10)
Tenure x Black	-0.25*** (0.05)	-0.30*** (0.05)	-0.27*** (0.07)	-0.30*** (0.09)	-0.28*** (0.09)	-0.22*** (0.07)	-0.25*** (0.08)
Share Certain x Tenure	0.25 (0.26)	0.25 (0.25)	0.07 (0.12)	0.14 (0.13)	0.13 (0.12)	0.13 (0.11)	0.15 (0.11)
Tenure	-0.11 (0.17)	-0.11 (0.16)	-0.06 (0.11)	-0.05 (0.11)	-0.04 (0.10)	-0.09 (0.10)	-0.03 (0.14)
Office Crime-Unit FE	✓	✓	✓	✓	✓	✓	✓
Black x Year x County FE		✓	✓	✓	✓	✓	✓
Prosecutor x Race FE			✓	✓	✓	✓	✓
Sentencing Guidelines				✓	✓	✓	✓
Charge FE					✓	✓	✓
Demographics					✓	✓	✓
Office Crime-Unit x Black FE						✓	✓
Prosecutor Certainty x Year x Black							✓

Effects Extend Beyond Arrest to Conviction ←



Jail & Traffic Stops

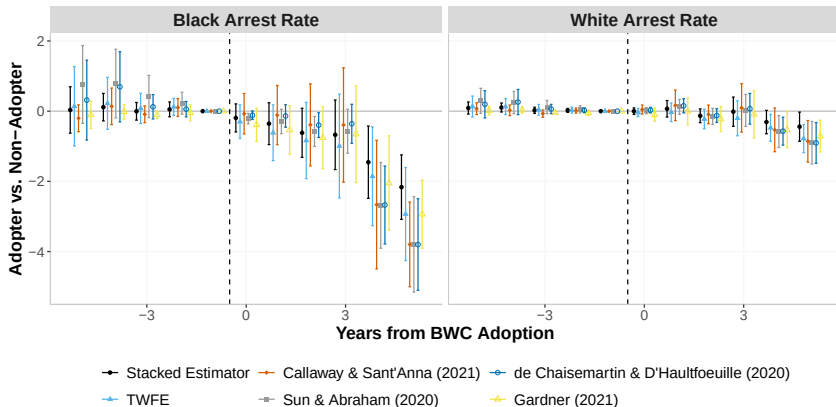
(a) Per Capita Traffic Stops

	Overall	Black	White	Disparity			
Black x BWC				-1.313* (0.704)	-1.223* (0.713)	-1.045 (0.641)	-2.062*** (0.666)
BWC	-1.200** (0.566)	-2.165** (1.034)	-0.853** (0.394)	-0.853** (0.394)	-1.051*** (0.380)	-0.763** (0.348)	-1.030*** (0.348)
Baseline Dependent Mean	8.91	17.08	6.10	8.91	8.91	8.91	8.91
Baseline Disparity				10.97	10.97	10.97	10.97
Percentage Change	-13.5%	-12.7%	-14.0%	-12.0%	-11.1%	-9.52%	-18.8%

(b) Per Capita Jail Time

	Overall	Black	White	Disparity			
Black x BWC				-0.169*** (0.057)	-0.152*** (0.056)	-0.165*** (0.058)	-0.097** (0.039)
BWC	-0.092*** (0.030)	-0.182*** (0.067)	-0.013 (0.020)	-0.013 (0.020)	0.017 (0.019)	-0.008 (0.019)	0.012 (0.020)
Baseline Dependent Mean	0.77	1.67	0.462	0.77	0.77	0.77	0.77
Baseline Disparity				1.20	1.20	1.20	1.20
Percentage Change	-11.9%	-10.9%	-2.88%	-14.0%	-12.6%	-13.7%	-8.1%

Arrests with Alternative Estimators

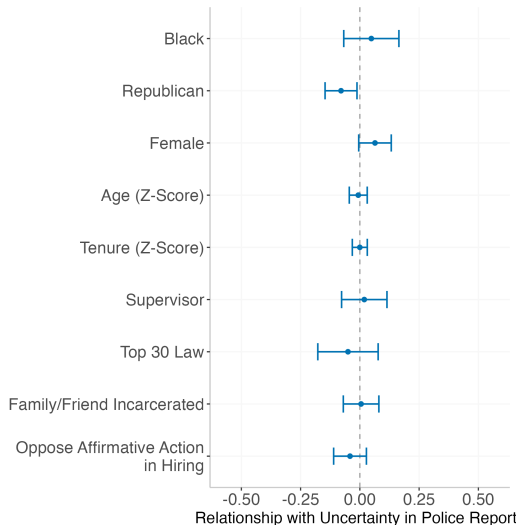


Omit counties that [never adopt](#) ⇒ [elect a new sheriff](#) ⇒ [use local funds](#) ⇒ [neighbor a treated cty](#) ⇒

[Balance in cty & prosecutor traits](#) ⇒ [No pre-trends in police killings](#) ⇒ [Effects broadly hold across 26 adopters](#) ⇒

[Allow adoption-group specific pre-trends](#) ⇒ [Worst-case scenario trends \(Roth, 2022\)](#) ⇒

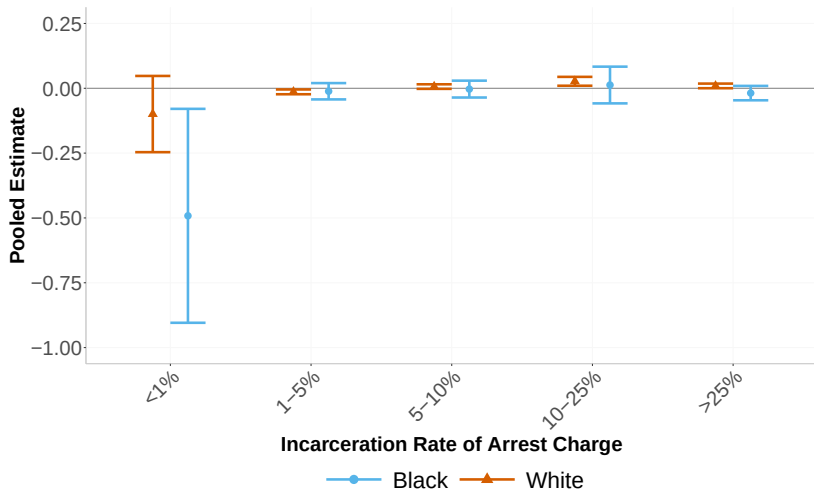
Certainty Weakly Related to Prosecutor Traits ⇐



Widely varies within office ⇒

Case characteristics are well-balanced ⇒

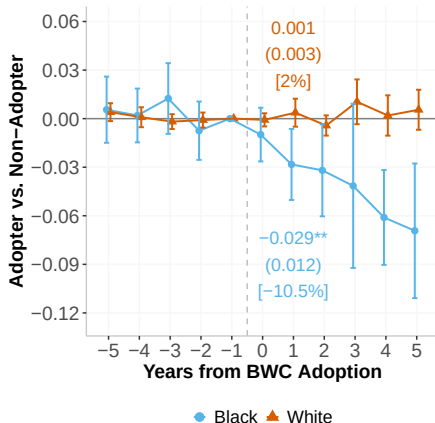
By Arrest Charge Severity



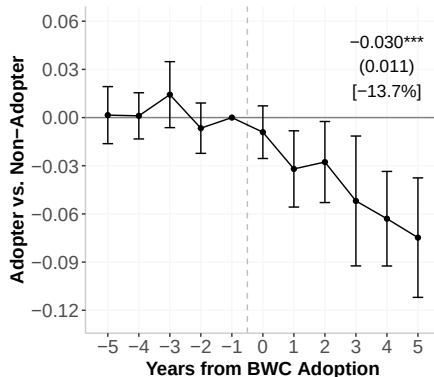
Change in Per Capita Incarceration



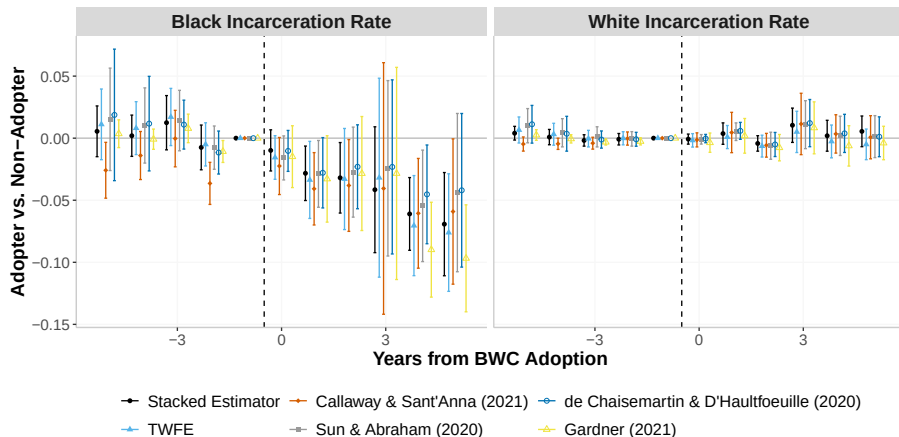
Per Capita Incarceration Rates



Disparity in Incarceration Rates



Incarceration with Alternative Estimators



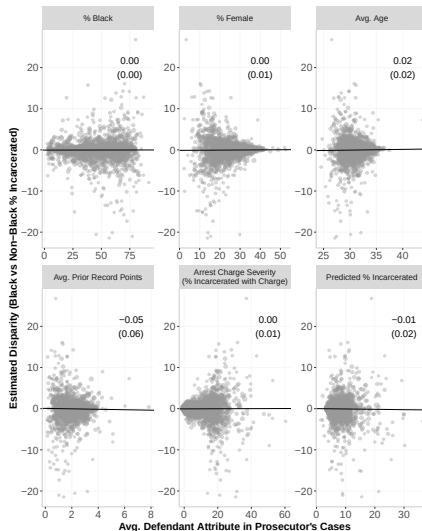
Linear trends by adoption group ⇒

Omitting never-BWC counties ⇒

[Buttons for other

robustness]

Balance Across Prosecutors with Different Disparate Impacts



Relationship Btw Certainty & Incarceration Disparities

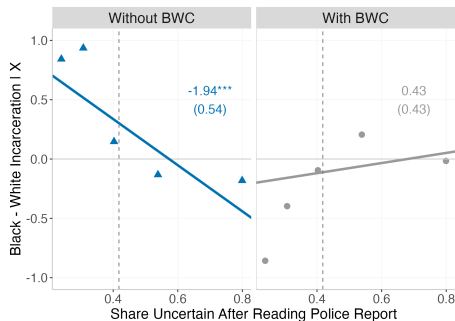


	% Incarcerated >6mo								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Black x Share Certain After Reading Police Report	1.36** (0.56)	0.84** (0.39)	0.77** (0.39)						
No BWC x Black x Share Certain				1.52** (0.76)	1.11** (0.54)	1.14* (0.59)			
BWC x Black x Share Certain				0.32 (0.38)	-0.20 (0.41)	-0.38 (0.37)			
Police-Init. x No BWC x Black x Certain							2.38*** (0.91)	1.91*** (0.55)	2.25*** (0.80)
Police-Init. x BWC x Black x Certain							0.13 (0.56)	-0.27 (0.42)	-0.55 (0.36)
Other Arrest x No BWC x Black x Certain							0.91 (0.86)	0.61 (0.63)	0.47 (0.62)
Other Arrest x BWC x Black x Certain							0.40 (0.53)	-0.19 (0.59)	-0.30 (0.56)
Office Crime-Unit FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Prosecutor FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sentencing Guidelines		✓	✓		✓	✓		✓	✓
Charge FE		✓	✓		✓	✓		✓	✓
Demographics		✓	✓		✓	✓		✓	✓
Office Crime-Unit x Black FF			✓			✓			✓

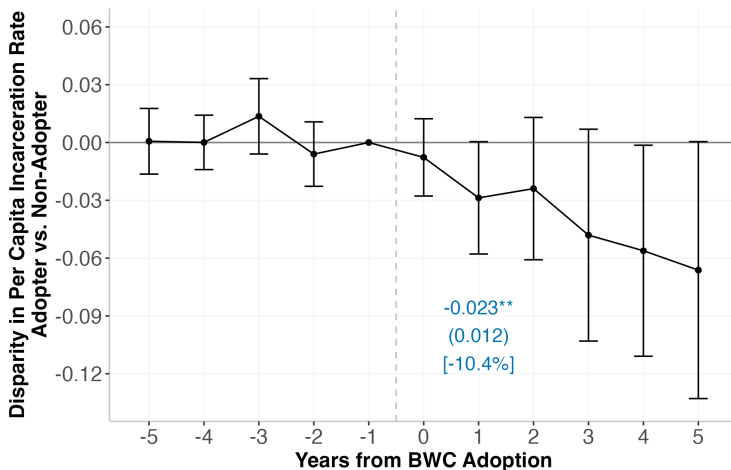
Surveillance is a substitute for skepticism: Police-Initiated



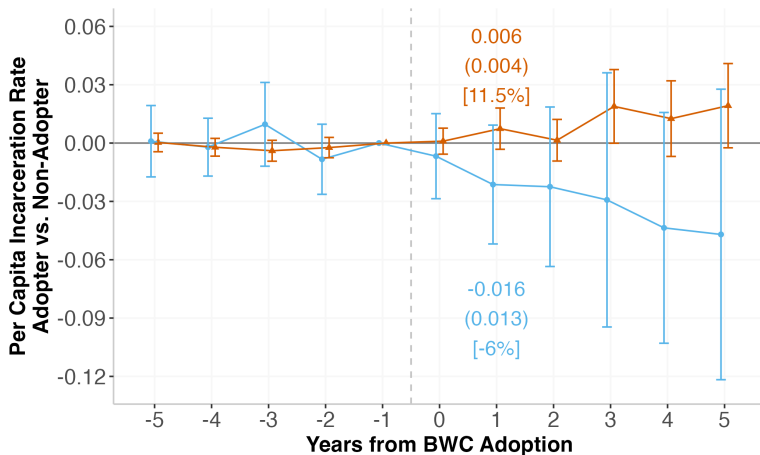
$$\text{Incarcerated}_i = \kappa \text{Uncertain}_{p(i)} \cdot \text{Black}_i + \mu_{p(i)} + X_i' \phi + \mu_{\text{unit}(i)} + \epsilon_i$$



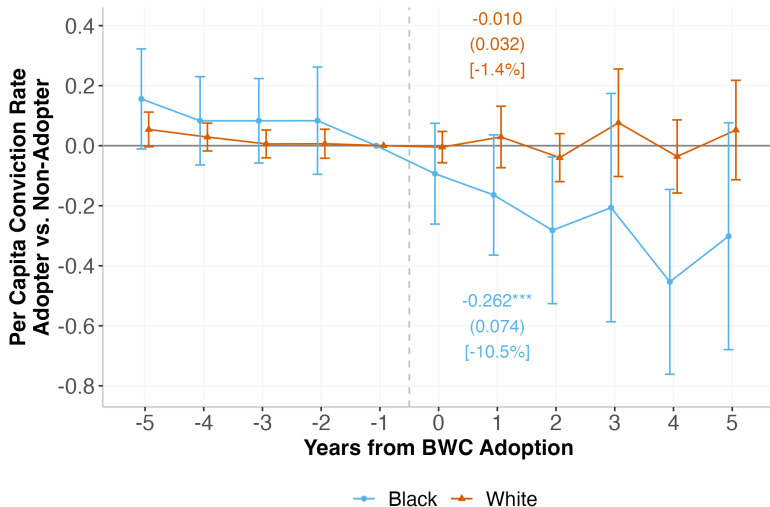
Allowing for Different Linear Trends by Adoption Group



Allowing for Different Linear Trends by Adoption Group

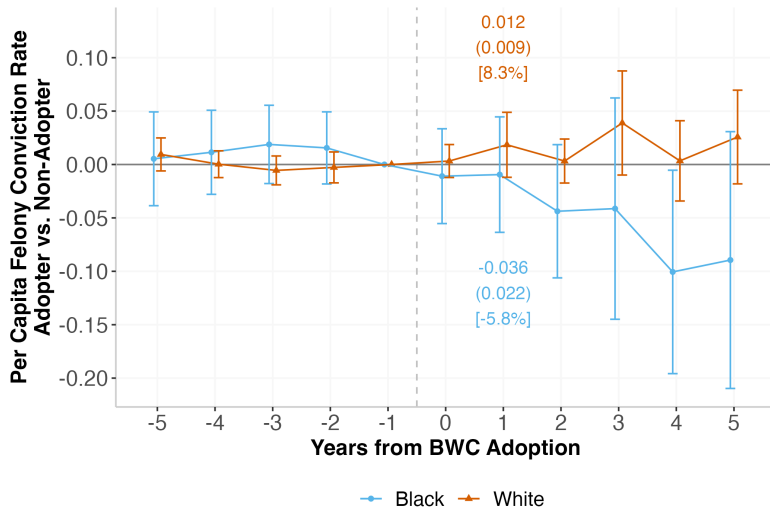


← Per Capita Conviction Rate



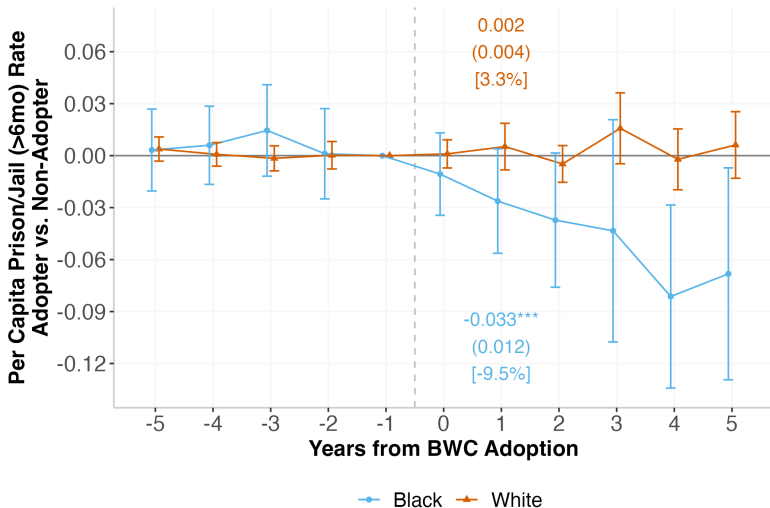


Per Capita Felony Conviction Rate



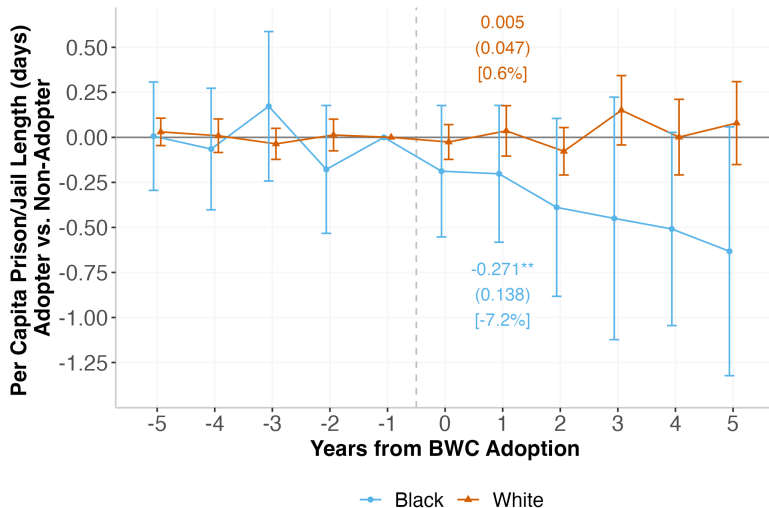


Per Capita Prison/Jail (>6mo) Rate



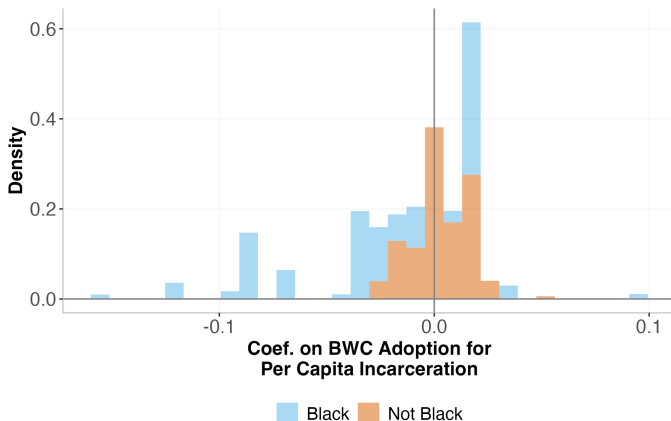


Per Capita Prison + Jail Length (in days)



Widespread Results Across Treated Counties ↩

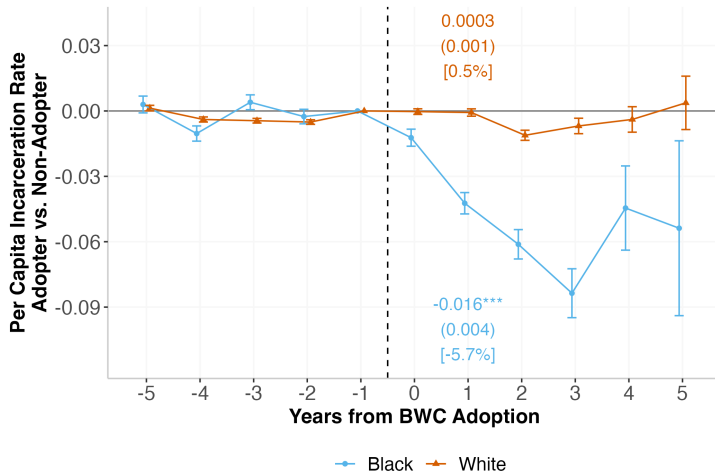
$$\text{Per Capita Incarceration}_{c,t} = \beta_f \mathbb{1}[c = f] \cdot \mathbb{1}[t \geq t_f] + \mu_c + \mu_t + \nu_{c,t}$$



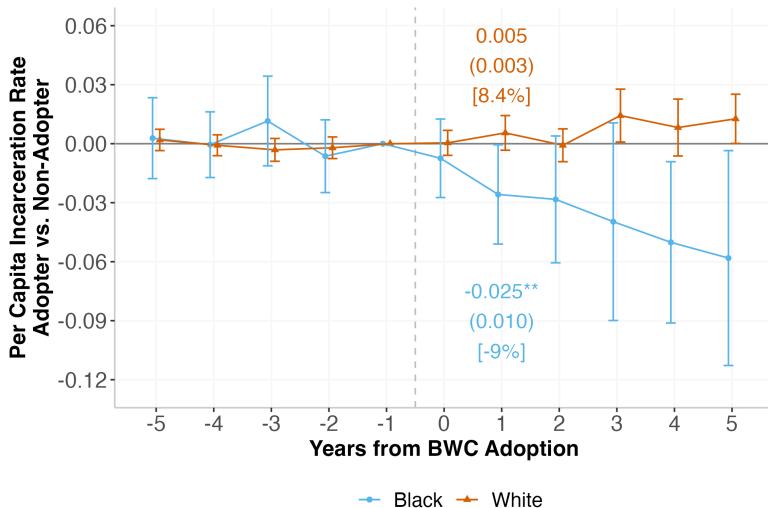
Each observation is a β_f for a different adopting county, f .

Alternative DiD Estimator

Estimate each experiment separately and then weight by precision.

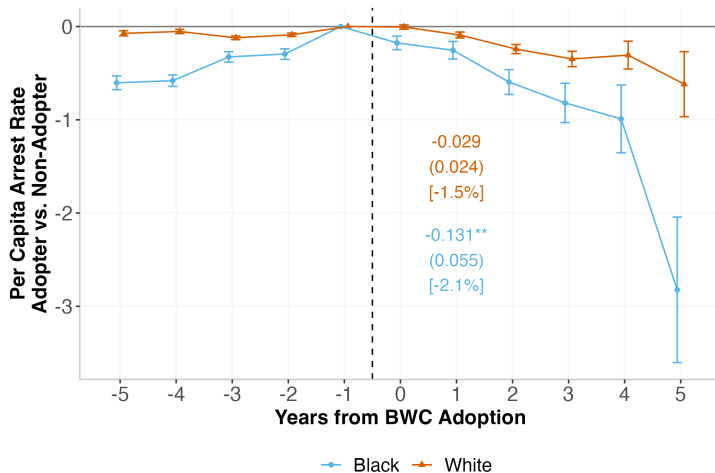


Omitting Never-Adopters

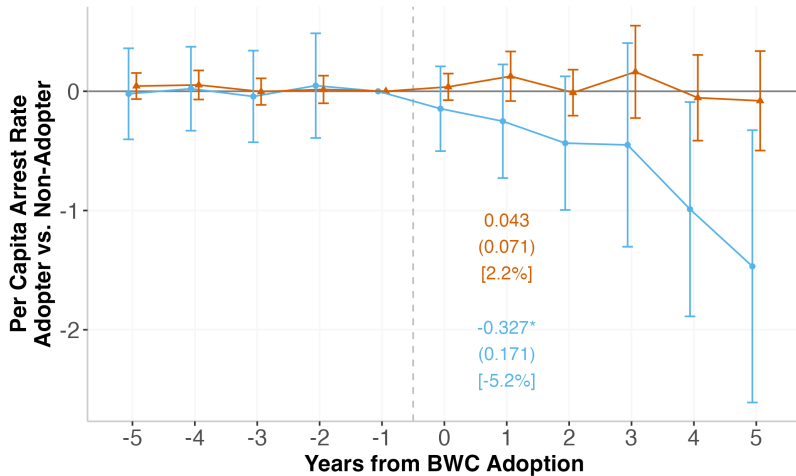


Alternative DiD Estimator

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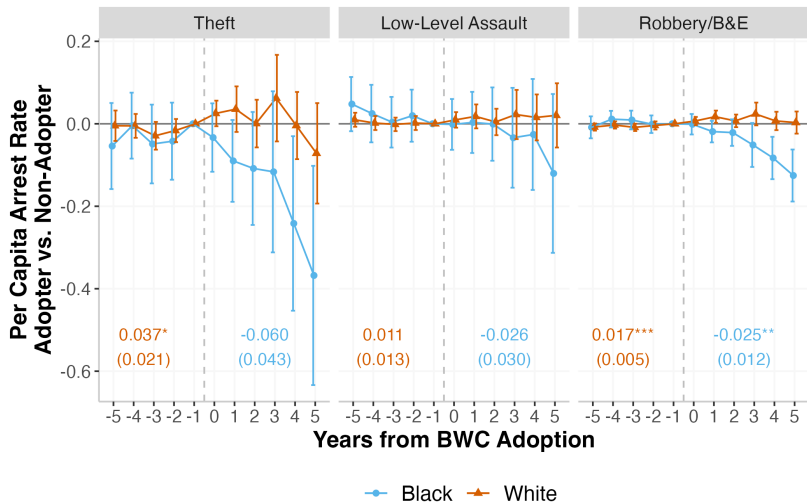
Omitting Never-Adopters



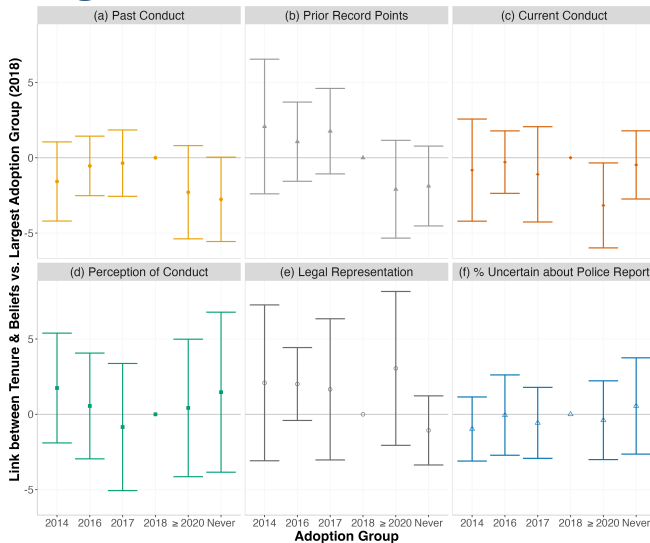
Sum Stats: Survey Representativeness

	All Years (1995-2019)			Most Recent Year (2019)		
	(1)	(2)	(3)	(4)	(5)	(6)
<u>Prosecutor Demographics</u>						
% Black Prosecutor	9.1	10.2	8.8	9.8	11.1	10.4
% Female Prosecutor	37.0	36.0	38.9	46.0	46.6	46.4
% Registered Democrat	42.0	46.5	46.2	43.0	48.9	51.8
Prosecutor Age (in Years)	38.4	37.2	36.2	39.4	38.3	37.8
Prosecutor Tenure (in Years)	4.9	5.0	6.7	6.4	6.2	7.9
<u>Jurisdiction Characteristics</u>						
% County Voters Reg. Democrat	37.1	40.6	41.7	36.5	39.9	41.1
% Urban (2010 Census)	57.7	66.1	67.7	56.5	64.5	63.3
<u>Sentencing Outcomes</u>						
% Incarcerated (i 6mo)	6.4	6.5	6.0	3.0	2.8	4.4
% Conviction	44.8	43.1	41.4	31.8	28.8	33.6
% Trial	0.7	0.7	0.6	0.3	0.3	0.5
<u>Defendant Demographics</u>						
% Black Defendant	45.3	53.2	55.7	43.5	51.4	52.8
% Female Defendant	27.5	26.5	26.5	30.0	28.9	27.4
Defendant Age (in Years)	31.3	31.1	30.9	32.7	32.3	32.2
# Cases	3,810,926	1,993,034	505,787	358,999	184,932	57,714
# Prosecutors	1,925	1,107	163	926	520	163
# Counties	100	39	52	100	40	40
# Counties with BWCs	26	13	13	26	13	13
# Offices	39	16	20	39	16	20
Participating Offices		✓			✓	
Participating Prosecutors			✓			✓

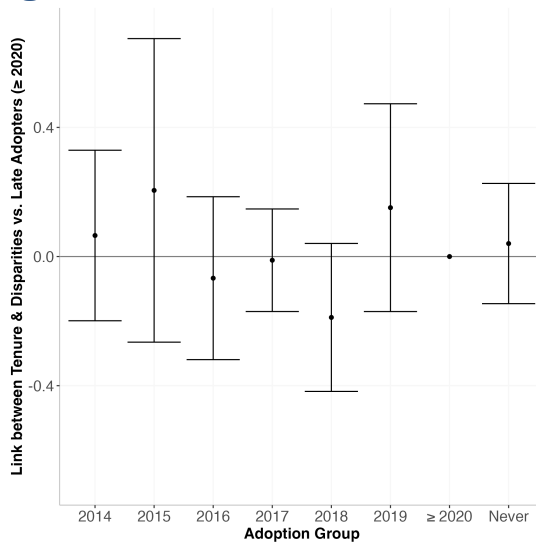
Other Arrest Types



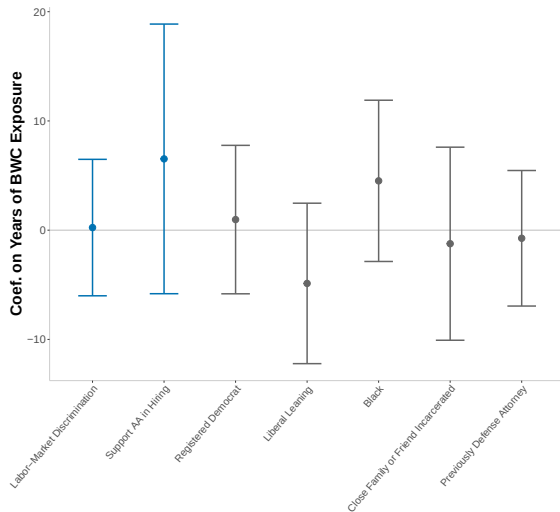
Exposure Design Placebo Check



Exposure Design Placebo Check



Placebo Check for Exposure Design



Prosecutor Selection: Change in Turnover

	Δ_{DID}	Baseline Mean	Percent of Baseline Mean
<u>County Demographics</u>			
Log Population	0.01 (0.01)	12.75	0.07%
% Black	0.14 (0.17)	25.43	0.57%
<u>County Economics</u>			
% Unemployed	0.03 (0.11)	6.90	0.36%
% Poverty	0.10 (0.27)	15.98	0.63%
Log Yearly Earnings (\$)	0.00 (0.01)	8.20	0.02%
Black Log Yearly Earnings (\$)	-0.01 (0.01)	7.73	-0.09%
White Log Yearly Earnings (\$)	0.01 (0.01)	8.30	0.08%
<u>County Politics</u>			
% Democratic Votes	-1.90* (1.15)	54.64	-3.47%
<u>Prosecutor Characteristics</u>			
% First-Year Hires	-0.59 (0.93)	11.08	-5.35%
% Departures	0.00 (0.51)	1.70	0.06%
% Democrat	0.49 (0.72)	13.34	3.68%
% Black	-0.03 (0.36)	4.18	-0.63%

Robust to Controls for Prosecutor Demographics



	(a) % Disparities Due to Past Conduct			(b) % Due to Prior Points		
Years of BWC Exposure	-3.94** (1.73)	-3.08** (1.34)	-2.98** (1.43)	-0.02 (1.36)	0.11 (1.44)	-0.38 (1.47)
Prosecutor Black		-14.75** (6.02)	-15.12** (6.38)		-2.27 (7.03)	-0.46 (6.42)
Prosecutor Democrat			2.10 (4.79)			-10.15 (8.32)
Dependent Mean	13.71	13.71	13.71	23.73	23.73	23.73
Observations	119	119	119	119	119	119
	(c) % Due to Current Conduct			(d) % Due to Perception of Conduct		
Years of BWC Exposure	-2.99** (1.33)	-2.09* (1.09)	-1.89* (1.13)	4.40** (2.15)	3.35* (1.89)	3.17* (1.89)
Prosecutor Black		-15.53*** (4.74)	-16.25*** (4.89)		18.06** (7.66)	18.70** (7.73)
Prosecutor Democrat			4.06 (4.66)			-3.62 (7.25)
Dependent Mean	7.35	7.35	7.35	18.27	18.27	18.27
Observations	119	119	119	119	119	119
	(e) % Due to Legal Rep.			(f) % Uncertain after Police Report		
Years of BWC Exposure	0.66 (1.97)	-1.05 (1.65)	-0.42 (1.65)	4.47* (2.60)	3.95 (2.53)	4.27 (2.58)
Prosecutor Black		29.38*** (9.34)	27.06*** (9.22)		8.74 (6.38)	7.13 (6.81)
Prosecutor Democrat			13.02** (5.68)			5.84 (6.53)
Dependent Mean	13.54	13.54	13.54	42.54	42.54	42.54
Observations	119	119	119	138	138	138