Something Works in U.S. Jails: Misconduct and Recidivism Effects of the IGNITE Program

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NBER Crime Working Group

Motivation

- The U.S. has the highest incarceration rate in the world, with over 2 million Americans in correctional facilities on any given day (Zeng 2022)
  - Over 600,000 people are held in **local jails**, the vast majority of whom are unconvicted or awaiting sentencing
  - Recidivism is common: one in four individuals are re-jailed within the same year

- Views on the effectiveness of prison rehabilitation are generally negative and slow to change, echoing the influential "nothing works" report (Martinson 1974)
  - Recent quasi-experimental studies from outside of the U.S. are more positive... (Bhuller et al. '20 (Norway); Mastrobuoni & Terlizzese '22 (Italy); Arbour et al. '23 (Canada))
  - ...but whether similar rehabilitative policies and philosophies can work in other contexts—and particularly in the US—remains unclear (Doleac 2023)

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This Paper

- We estimate the effects of IGNITE: an innovative education program launched September 2020 in the Genesee County Jail (serving Flint, MI)
  - Tailored education and training, offered to all jailed individuals ($> 90\%$ takeup)
  - Law-enforcement-led: repurposed space, same staff, roughly budget-neutral
  - Administrators emphasize a cultural change: IGNITE "gives people hope"
- **Policy relevance**: Program is now being scaled-up nationally Locations
- **Understudied setting**: The local jail of a hard-hit U.S. community Flint
- **Rich administrative data**: Jail management systems, district court records, educational records and within-jail text messages + community & staff surveys
- **Novel identification strategy**: Quasi-random court delays as an instrument for time in jail, pre- and post-IGNITE

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Preview of Results

- One month of IGNITE exposure reduces weekly major misconduct in jail (*e.g.*, violence, selling contraband) by 16pp (49%)
  - Consistent across demographics / prior offense status / local lead exposure
  - No effect on medical events / prison sentencing
- One month of IGNITE exposure reduces 3-month recidivism by 8pp (18%)
  - Effects grow over time, to around 15pp for one-year recidivism
  - Largest effects are among individuals with high predicted recidivism risk
  - Reduces 12-month social cost of crime by at least $5,600 per person-month
- Mechanisms: both human capital upgrades and an apparent culture change
  - Program participants gain a full grade level in math/reading achievement
  - IGNITE-exposed individuals have more positive views of law enforcement and are more likely to use positive/trustful words in jail text messages
  - IGNITE-exposed staff report being more positive on educational programming

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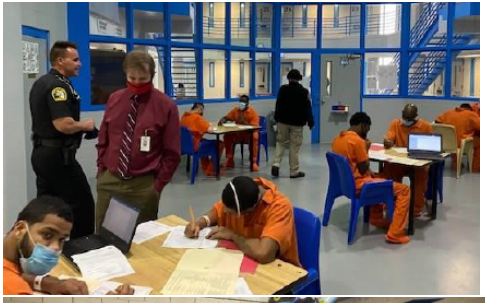
Literature Connections

- IGNITE effects are comparable to recidivism reductions from other rehabilitative programs in other settings/countries (e.g., Heller et al. 2017; Mastrobuoni & Terlizzese 2022; Arbour et al 2023; Shem-Tov et al 2021; Bhuller et al. 2020)
  - We find "something works" in the jail of a hard-hit US community, at low cost
- We add to a large literature studying crime/recidivism effects of various interventions (Mueller-Smith & Schnepel 2021; Augustine et al. 2022; Golestani et al. 2021; Tobón 2022; Di Tella & Schargrodsky 2013; Lee 2023; Henneguelle et al. 2016; Williams & Weatherburn 2022, Lochner and Moretti 2004; Lavecchia et al. 2024; Agan et al. 2023)
  - Unique administrative data also lets us study within-facility misconduct, adding to a recent quasi-experimental literature (Arbour et al. 2023; Caceres-Bravo 2024)
- Methodologically, we contribute a new "difference-in-IV" strategy that leverages administrative delays before and after a policy reform
  - We pair quasi-experimental estimates with qualitative evidence on mechanisms

Outline

Inmate Growth Naturally and Intentionally via Education (IGNITE)

- Launched September 2020; offered to all jailed individuals
  - Participation incentivized with tablets; >90% take-up Take-up
- Tailored education and training Ex.
  - Two hours of instruction each day via chromebooks Schedule
  - GED, CDL, Servsafe, Masonry ...
- Post-release programs at the Mt. Morris Education & Community Center ("IGNITE Academy")



Jake May – MLive Flint

Court Delays

- Common for misdemeanors & felonies: at arraignment, pre-trial, & trial Rates
- Most common reasons:
  - Court starting late/running over Time of Day
  - Fiscal crises / COVID closures Crises
  - Judge absences, delays in evidence retrieval, etc.
- We focus on District Court delays, which appears idiosyncratic conditional on:
  - Courtroom (*e.g.* some courts more congested/efficient than others)
  - Number and type of charges (*e.g.* delays are more likely for some misdemeanors)
  - Day of week (*e.g.* delays are more likely on Fridays) Day of Week

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Primary Data

- Genesee County Jail Management System (JMS) Details
  - Administrative records of individual-episode level data
  - Records major and minor misconduct as well as medical incidents
  - Jail booking and exit time stamps give precise time spent in jail
  - Recidivism outcomes measured by individual re-booking Reporting Bias
- Court Register of Actions (ROA) Details
  - History of a case, generated for by District and Circuit Courts
  - Records if a hearing was removed from calendar ($\implies$ delay)
- Estimation sample: 23,610 booking episodes involving 14,794 individuals from January 2016 - May 2022 (rebooking outcomes through May '23) Sample Detail

Summary Statistics

	Mean (1)	SD (2)	N (3)
Panel A: Instrument and Outcomes			
Any Delay	0.381	(0.486)	23,610
Months in IGNITE	0.434	(2.091)	23,610
Months in Jail	1.558	(4.212)	23,610
Ever Rebooked in 3 Months after Release	0.175	(0.380)	22,191
Any Major Misconduct	0.092	(0.289)	23,610
Panel B: Individual and Case Characteristics			
Female	0.240	(0.427)	23,610
Age 25-34	0.378	(0.485)	23,610
Age 35-44	0.225	(0.418)	23,610
Age 45-54	0.122	(0.327)	23,610
Age 55-64	0.058	(0.234)	23,610
Age 65+	0.009	(0.092)	23,610
Black	0.534	(0.499)	23,610
Booked in Past Year	0.433	(0.496)	23,610
Felony	0.534	(0.499)	23,610
Number of Charges	1.385	(0.867)	23,610
Panel C: Census Tract Characteristics			
Share with Elevated Blood Lead Level	0.031	(0.028)	22,318
Share Black	0.429	(0.354)	22,320
Share High School Graduate or Higher	0.848	(0.066)	22,320
Log Median Household Income	10.322	(0.425)	22,318

Identification Strategy

Estimating IGNITE Exposure Effects

- We use court delays to estimate the effects of IGNITE exposure
  - Delays increase an individual's time in jail, both pre- and post-IGNITE
  - We compare the post vs. pre effect of jail time on misconduct/recidivism
- Two key assumptions (with corresponding checks):
  - Delays are conditionally as-good-as-random (balance tests)
  - If not for the start of IGNITE, delay-based IV estimates wouldn't have changed in September 2020 (trend analyses; complier characteristics; robustness checks)
- We also show robustness to an alternative "difference-in-IV" comparing Genesee County to neighboring Saginaw County in the post-IGNITE period
  - Also a "double difference-in-IV" which combines both contrasts

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Balance and First Stage

	Mean	Diff. Mean	S.E.
Panel A: Inmate Characteristics			
Female	0.240	0.005	(0.007)
Age 25-34	0.378	0.007	(0.008)
Age 35-44	0.225	-0.008	(0.007)
Age 45-54	0.122	-0.009*	(0.005)
Age 55-64	0.058	-0.001	(0.004)
Age 65+	0.009	0.001	(0.001)
Black	0.534	-0.013	(0.008)
Booked in Past Year	0.433	-0.000	(0.007)
Public Defender	0.116	0.005	(0.005)
Panel B: Census Tract Characteristics			
Share with Elevated Blood Lead Level	0.031	-0.004	(0.004)
Share Black	0.429	-0.011	(0.008)
Share High School Graduate or Higher	0.848	-0.002	(0.007)
Log Median Household Income	10.322	-0.011	(0.044)
Missing Census Tract Information	0.055	0.003	(0.004)
F-Statistic for Joint Test [*p*-value]		1.353 [0.204]	
Panel C: First Stage			
Months in Jail	1.558	0.396***	(0.061)
Design Controls		Yes	
Observations		23,610	

Notes: Design controls include court division fixed effects, hearing day of week, and number/type of charge fixed effects. Standard errors are clustered by individual.

Attrition
First-Stage Margins

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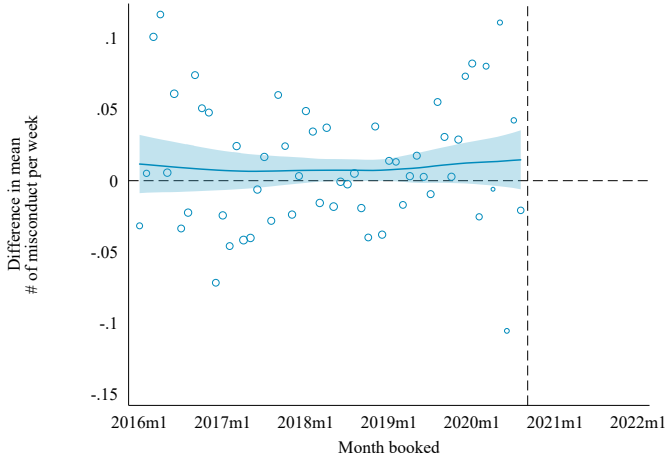
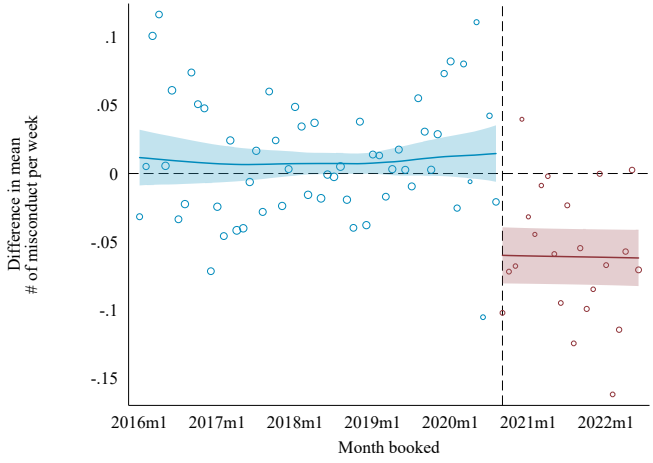
Reduced-Form Effects on Misconduct, Pre-IGNITE



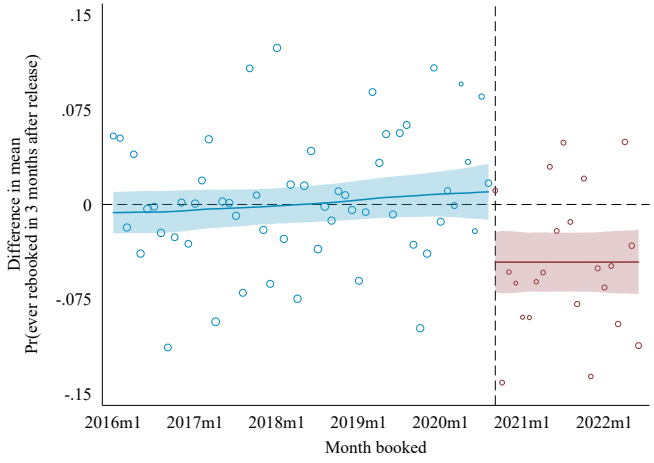
Notes: Dots indicate court delay effects on major misconduct rates for each booking month. The vertical line indicates the beginning of IGNITE. Design controls are included.

Reduced-Form Effects on Misconduct, Post-IGNITE



Notes: Dots indicate court delay effects on major misconduct rates for each booking month. The vertical line indicates the beginning of IGNITE. Design controls are included.

Reduced-Form Effects on Recidivism, Pre- and Post-IGNITE



Notes: Dots indicate court delay effects on 3-month recidivism rates for each booking month. The vertical line indicates the beginning of IGNITE. Design controls are included. First Stage

Complier Characteristics, Pre- vs. Post-IGNITE

	Pre-IGNITE (1)	*Post-IGNITE* (2)	*Pre − Post* (3)	*Full Sample* (4)
Panel A: Individual Characteristics				
Peer Pred. Risk				
Female	0.151	0.086	0.064	0.240
	(0.066)	(0.054)	(0.083)	
Age 25-34	0.223	0.296	-0.073	0.378
	(0.116)	(0.100)	(0.149)	
Age 35-44	0.237	0.103	0.134	0.226
	(0.091)	(0.088)	(0.125)	
Age 45-54	0.163	0.213	-0.050	0.122
	(0.084)	(0.075)	(0.111)	
Age 55-64	0.116	0.156	-0.040	0.058
	(0.047)	(0.055)	(0.070)	
Black	0.593	0.461	0.132	0.534
	(0.115)	(0.107)	(0.154)	
Booked in Past Year	0.407	0.320	0.086	0.433
	(0.118)	(0.102)	(0.152)	
Panel B: Crime Characteristics				
Crimes against Persons	0.942	0.774	0.168	0.387
	(0.100)	(0.091)	(0.132)	
Crimes against Property	0.303	0.079	0.224	0.224
	(0.103)	(0.096)	(0.137)	
Crimes against Public Order	0.050	0.019	0.031	0.099
	(0.059)	(0.045)	(0.073)	
Drug Crimes	0.134	0.124	0.009	0.170
	(0.082)	(0.075)	(0.108)	
Weapons Crimes	0.328	0.360	-0.032	0.148
	(0.117)	(0.102)	(0.152)	
Traffic Crimes	0.098	0.179	-0.082	0.278
	(0.070)	(0.069)	(0.095)	
Other Crimes	0.252	0.133	0.119	0.166
	(0.105)	(0.097)	(0.140)	

IV Specification

- We estimate β: marginal effect of IGNITE exposure, holding fixed time in jail

$$Y_i = \beta M_i^I + \gamma M_i^J + X_i'\delta + \varepsilon_i$$

  - M_i^I: Number of months individual i is exposed to IGNITE within jail
  - M_i^J: Number of months individual i is in jail (pre- or post-IGNITE)

- Instrument M_i^I and M_i^J with Z_i and $Z_i \times P_i$
  - Z_i: Indicator for any court delay
  - P_i: Indicator for booking after September 2020
  - X_i: Design controls and P_i, other case/individual characteristics for precision

- Reduces to a simpler "difference-in-IV" estimator when nobody booked pre-IGNITE ends up being exposed to IGNITE (i.e., $M_i^I = P_i \times M_i^J$) Details

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Main Results

First Stage Estimates

	Months in IGNITE		Months in Jail	
	(1)	(2)	(3)	(4)
Court Delay × Post-IGNITE	0.521***	0.519***	0.120	0.113
	(0.096)	(0.096)	(0.119)	(0.119)
Court Delay	0.128***	0.130***	0.393***	0.401***
	(0.029)	(0.029)	(0.073)	(0.073)
Control Mean	0.102	0.102	1.311	1.311
SW F-Court Delay × Post-IGNITE	79.909	79.611	79.909	79.611
SW F-Court Delay	55.159	56.549	55.159	56.549
Design Controls	Yes	Yes	Yes	Yes
Auxiliary Controls	No	Yes	No	Yes
Observations	23,610	23,610	23,610	23,610

Margins

IV Estimates

	Major Misconduct		Recidivism	
	(1)	(2)	(3)	(4)
Months in IGNITE	-0.161***	-0.160***	-0.081***	-0.081***
	(0.041)	(0.041)	(0.032)	(0.032)
Months in Jail	0.079***	0.077***	0.014	0.009
	(0.030)	(0.029)	(0.031)	(0.029)
Months in IGNITE+Months in Jail	-0.082***	-0.082***	-0.067***	-0.071***
	(0.025)	(0.025)	(0.021)	(0.021)
Control Complier Mean	0.329	0.329	0.457	0.457
Design Controls	Yes	Yes	Yes	Yes
Auxiliary Controls	No	Yes	No	Yes
Observations	23,610	23,610	22,191	22,191

OLS Estimates Continuous Outcomes

Concerns and Checks

- *Rescheduling compliers were different pre- vs. post-IGNITE*
  - ✓ Compliers are similar on all observables
  - ✓ IV puts similar weights on different time-in-jail margins Go
  - ✓ No pre-IGNITE effect on recidivism, so could just look at post period
  - ✓ Effects seem homogenous across observables / time-in-jail margins Go
- *COVID put riskier individuals in jail post-IGNITE*
  - ✓ Estimates are similar or larger in samples with high predicted risk Go
- *COVID changed how misconduct / recidivism outcomes were measured*
  - ✓ Similar effects on misconduct not involving others Go
  - ✓ Robustness to time trend × rescheduling control Go
- *COVID was weird (period)*
  - ✓ Similar results dropping March 2020 - June 2021 Go
  - ✓ Similar results using Saginaw County as the post-period control group

Alternative Difference-in-IV Specifications

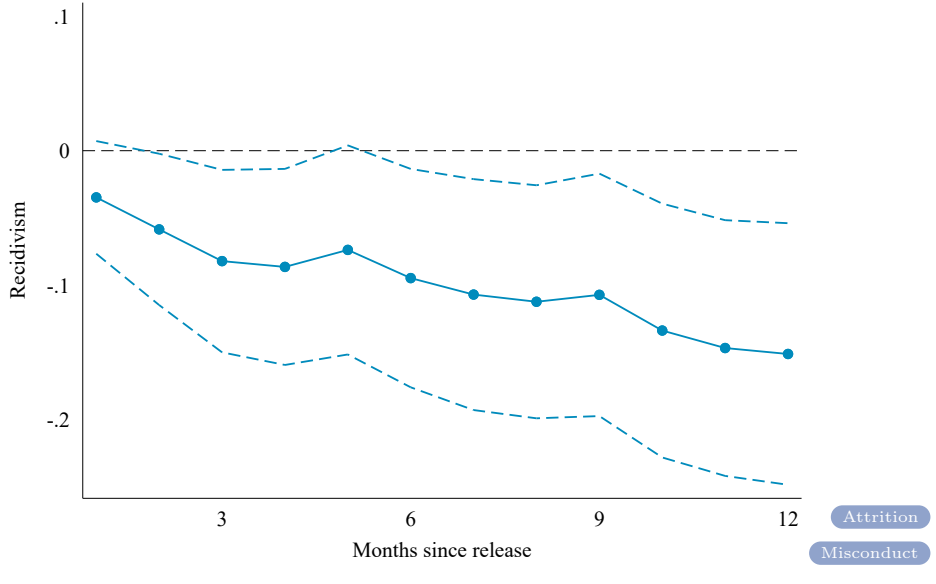
	Difference-in-IVs			
	Post vs. Pre, Genesee (Baseline) (1)	Genesee vs. Saginaw, Post (2)	Post vs. Pre, Saginaw (3)	Double Diff-in-IVs (4)
Months in IGNITE	-0.081***	-0.064***		-0.075**
	(0.032)	(0.024)		(0.030)
Months in Jail	0.009	0.021	0.009	
	(0.029)	(0.017)	(0.035)	
Months in Jail × Post			-0.006	
			(0.007)	
Observations	23,610	6,380	14,227	37,837

We also find similar results with standard judge IV and difference-in-difference strategies (though identifying assumptions seem less tenable) Judge IV DiD

Possible Threats and Checks (Cont.)

- *District Court delays are not as-good-as-random*
  - ✓ Robust to including Circuit Court delays Go
  - ✓ Robust to restricting IV to days with multiple delays Go
  - ✓ Robust to using only COVID/fiscal crisis delays Go
- *Court delays directly affect outcomes (e.g. by increasing frustration)*
  - ✓ Wouldn't bias IGNITE effect estimate if similar pre vs. post
  - ✓ Robust to controlling for an individual's total number of delays Go
- *Misconduct reductions just come from keeping individuals "busy"*
  - ✓ Similar effects on misconduct during times with no IGNITE programming Go

Recidivism Effects Over Time



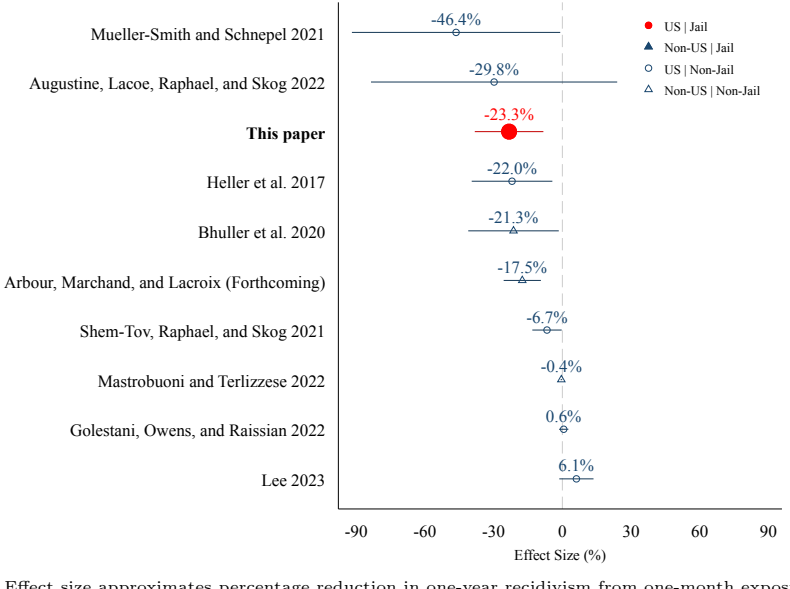
Social Cost of Crime Effects

	Costs from Future Crimes			
	3 Months	6 Months	9 Months	12 Months
	(1)	(2)	(3)	(4)
Months in IGNITE	-2957.46**	-3943.38**	-5293.63***	-5614.70**
	(1238.02)	(1653.90)	(1972.45)	(2197.60)
Control Complier Mean	12212.62	26148.83	39364.44	45535.49
Observations	22,191	21,525	21,139	20,766

Notes: To calculate social costs of crime, we divide crimes into the following categories: DUIs, drug offenses, motor vehicle offenses, persons offenses, property offenses, public order offenses, weapons offenses, and other offenses. Within each of these crime types, we take the lowest social cost estimate from Miller et al. (2021) to provide the most conservative estimate possible (*e.g.,* we use the cost estimate for assault instead of murder for persons offenses). We then use the total social cost (sum of frequency of crime * cost of crime) and instrument for IGNITE using the usual procedure to produce the estimates.

Budget

Comparison to the Literature



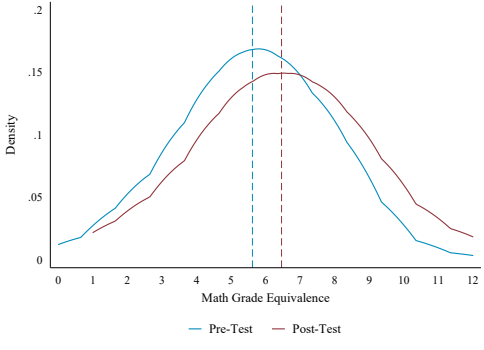
Notes: Effect size approximates percentage reduction in one-year recidivism from one-month exposure.

Additional Results

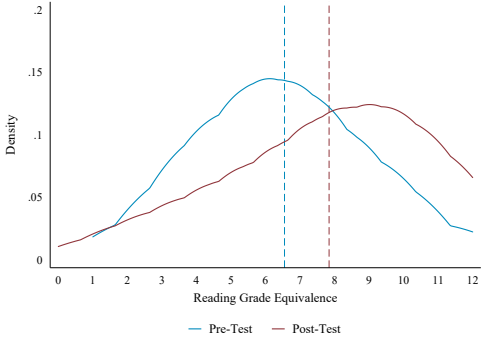
- Similar effects on recharging / reconvicting / minor misconduct Go
- No effects on prison sentencing or medical outcomes Go
- Similar effects by demographics / prior offense status / lead exposure Go
- Larger effects for higher-risk individuals Go

Mechanisms

Math and Reading Test Score Gains



(a) Math



(b) Reading

Notes: Math (N: 439) and Reading (N: 309) grade-equivalent test-scores administered by Mt. Morris before and after IGNITE participation. Scores are from the Comprehensive Adult Student Assessment Systems (CASAS) exams in Reading and Math.

Looking Beyond Test Scores

- *"[IGNITE] really humanizes people...[both] the inmate population and the deputy population"*
  - Deputy Conner Bigelow

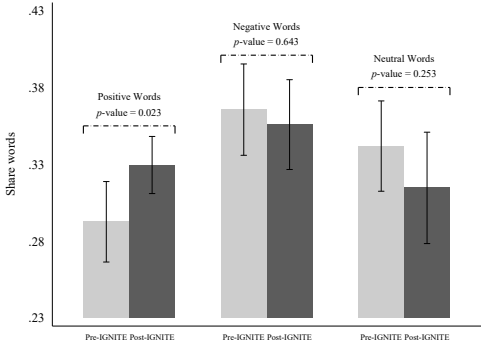
- *"County jails across America are filled with people where 90% are going back to the community... so our question, as a Sheriff, is: how do you want us to prepare them to come back to your neighborhoods?"*
  - Sheriff Chris Swanson

Genesee County Community Survey

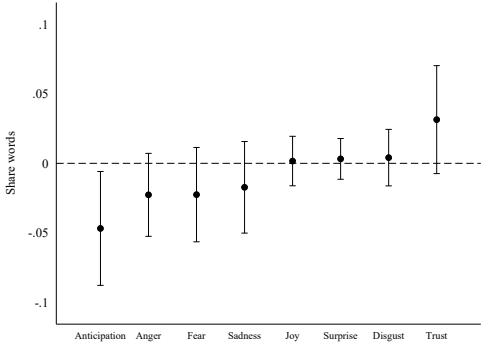
	Positive View of Law Enforcement		Engaged in Positive Activities		Hopeful about the Future	
	(1)	(2)	(3)	(4)	(5)	(6)
IGNITE Exposure	0.233**	-0.126	0.087	0.093	-0.051	-0.103
	(0.112)	(0.214)	(0.117)	(0.242)	(0.126)	(0.256)
IGNITE Exposure × Months in Jail		0.187*		-0.031		0.039
		(0.094)		(0.103)		(0.102)
Control Mean	0.333	0.333	0.656	0.656	0.656	0.656
Observations	87	87	62	62	62	62

Notes: IGNITE-exposed individuals are those who either personally experienced time in Genesee County Jail on or after September 2020 or who had friends/family with such experience. Regressions in even-numbered columns controls for months in jail.

Jail Text Message (Kites) Sentiment Analysis



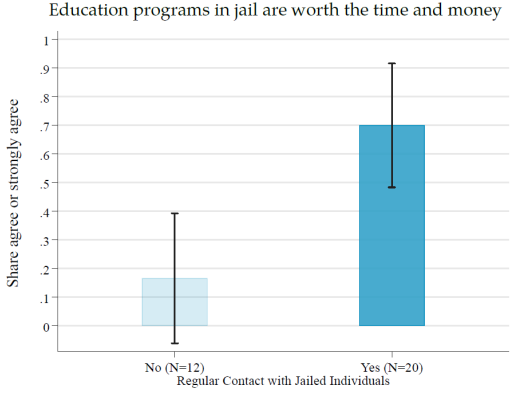
(a) Sentiment Pre- and Post-IGNITE

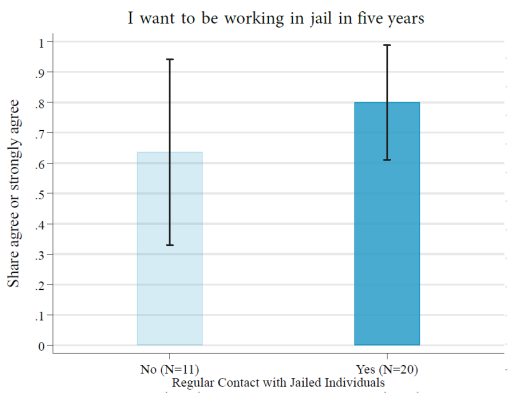


(b) Post-Pre Emotion Prevalence

Notes: Kites message sentiment as measured by the NRC Word-Emotion Association Lexicon (Mohammad and Turney, 2010).

Genesee County Jail Staff Survey





Notes: Staff with regular contact work with incarcerated individuals "usually" or "always" vs. "about half the time," "seldom," or "never."

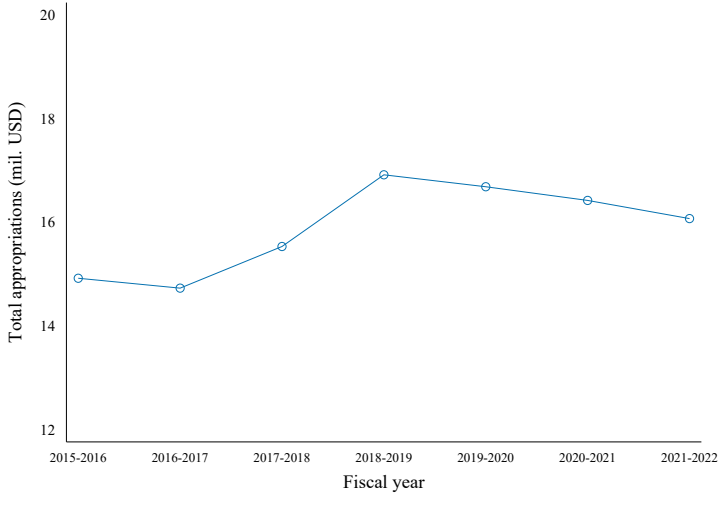
Summary

- Robust evidence that something (really) works for rehabilitation in a U.S. jail
  - Impressive but plausible reductions in recidivism
  - Even larger reductions in within-jail misconduct
  - Large gains in test score achievement for a low literacy / numeracy population
  - Improved views of law enforcement by the community + more positive sentiment
- A novel identification strategy, leveraging idiosyncratic appointment delays
  - Potentially useful in other settings, both within and outside of criminal justice (e.g. healthcare, education, public benefits...)

Thank You!

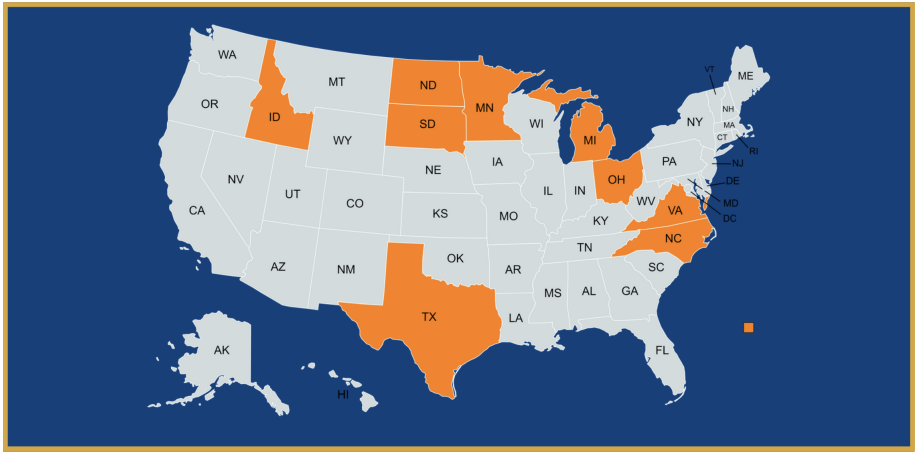
Appendix

Genesee County Corrections Department Budget



Overview
Social Cost

IGNITE Locations



Notes: IGNITE is currently active in 9 county jails across 9 states, and continues to spread with 4 of the current sites beginning in 2023. Image taken from *NSA I.G.N.I.T.E. INSIGHT September 2023 Newsletter*

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Setting: Genesee County, MI

- Seat of County: Flint
  - 57% Black, 33% NH White, 5% Hispanic
- Hit hard by automation/globalization
  - Declining population
  - One-third of households in poverty
- Flint consistently ranks as one of the highest crime cities in the US
  - FBI crime rate: 1,817 vs 381 (US) per 100k
  - Homicide rate: 67 vs 7.8 (US) per 100k

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IGNITE Participation Balance

	Overall Mean (1)	Difference in Means (2)	Standard Error (3)
Panel A: Individual Characteristics			
Female	0.131	0.056	(0.046)
Age	34.291	2.450	(2.003)
Black	0.548	-0.082	(0.091)
Booked in Past Year	0.458	-0.001	(0.001)
Public Defender	0.191	0.043	(0.052)
Panel B: Census Tract Characteristics			
Share with Elevated Blood Lead Level	0.030	-0.001	(0.001)
Share Black	0.433	0.027	(0.033)
Share High School Graduate or Higher	0.838	-0.027	(0.030)
Log Median Household Income	10.545	-0.550	(0.672)
Missing Census Tract Information	0.032	0.002	(0.003)
F-Statistic for Joint Test [p-value]		1.021 [0.321]	
Observations		227	

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Example IGNITE Programs

Inmate A	Inmate B	Inmate C
Has high school diploma	No high school diploma/GED	Limited grade school education
Goal: begin an associates degree or specialty field	Goal: Obtain a GED and learn about opportunities	Goal: Learn to read and write
Enrolls in:	Enrolls in:	Enrolls in:
College-level classes	GED program	Reading, Writing, Math
CDL program	Trade School/VR Simulator	Health & Wellness
Serve safe program	Financial Literacy	

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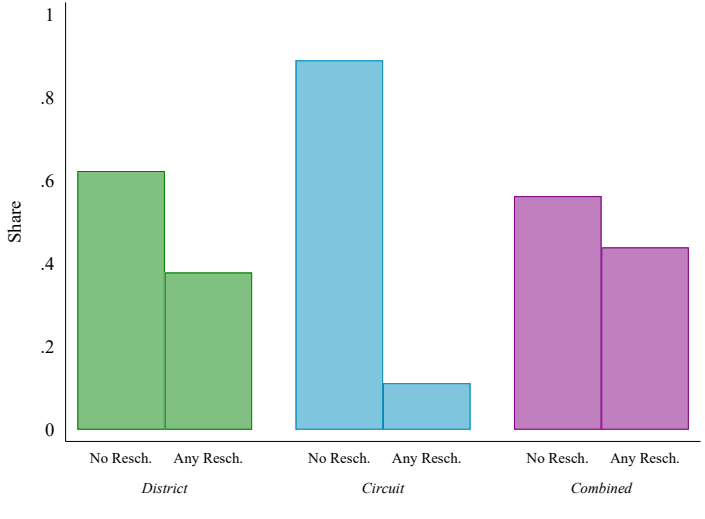
IGNITE Schedule

		3rd floor	4th floor	5th floor	Reminders
6am		shift change	shift change	shift change	
6:30am		Breakfast	Breakfast	Breakfast	trays off floor by 7:15
8am		IGNITE	Mandatory Cleaning	Mandatory Cleaning	
9am		Cleaning/ Hour out's	Dayroom open to all	IGNITE	
10am		Dayroom open to all	IGNITE	Dayroom open to all	
11am		IGNITE	Dayroom open to all	Dayroom open to all	
noon		Lunch	Lunch	Lunch	trays off floor by 12:45
1p		Dayroom open to all	Dayroom open to all	IGNITE	
2p		Dayroom open to all	Dayroom open to all	Dayroom open to all	
3p		Dayroom open to all	IGNITE	Dayroom open to all	
4pm		Dinner	Dinner	Dinner	trays off floor by 4:45
5p-5:30p		Mandatory Cleaning	Mandatory Cleaning	Mandatory Cleaning	
5:30p-6:30p		Shift change	Shift change	Shift change	
6:30p		Dayroom open to all	Dayroom open to all	Dayroom open to all	Dayroom open no later than 6:30pm
8p		Dayroom open to all	Dayroom open to all	Dayroom open to all	
9p		Dayrooms Closed	Dayrooms Closed	Dayrooms Closed	Dayroom open until 9pm
Service such as Laundry, Commissary, Medical, PO visits are not allowed on housing units during IGNITE time					

Rescheduling Frequency by Court



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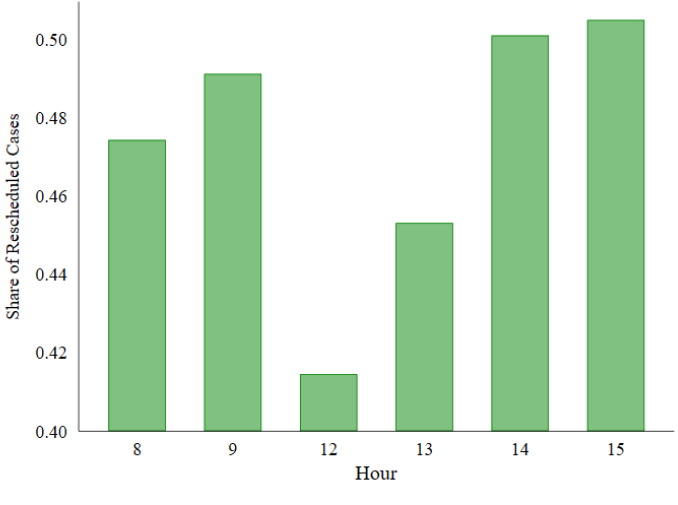
Rescheduling Frequency by Time of Day



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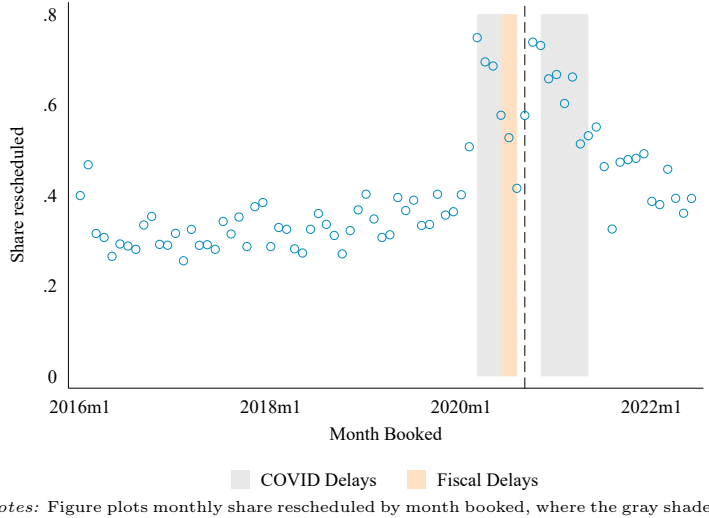
Crisis Delays



Notes: Figure plots monthly share rescheduled by month booked, where the gray shaded areas indicate court closures due to COVID, and the yellow shaded areas are periods with fiscal crises. The vertical dashed line indicates the beginning of IGNITE.

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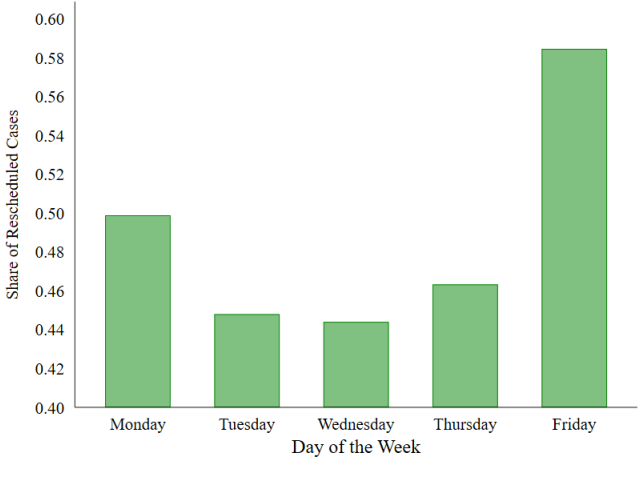
Rescheduling Frequency by Day of Week



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Jail Management System (JMS)

- Electronic records from 2015 to 2022
  - Episode-level data includes major and minor incidents as well as suicide and medical incidents
  - Recidivism outcomes measured by re-booking
- Major incidents include:
  - Threatening another with bodily harm, or any offense against another person
  - The attempt or act of introducing or distributing any contraband in the jail
  - Inflicting bodily injury upon another person
  - Engaging in or encouraging a disruptive demonstration or activity
  - Refusing to follow instructions given by a staff member
- Minor incidents include: Disorderly conduct that disrupts security, insolence towards staff members, being in an unauthorized area, possession of unauthorized items, lying or providing false statements

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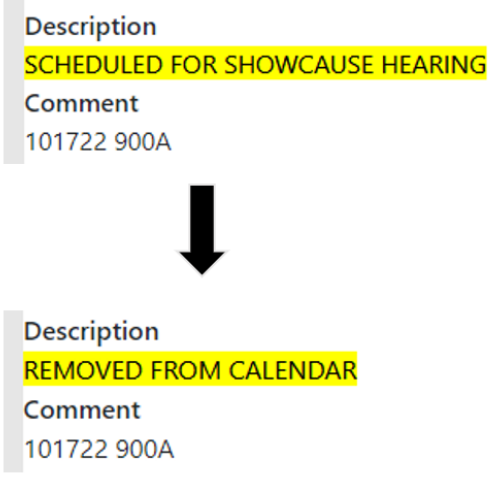
Register of Actions (ROA)

- ROA generated by court for each case; if not charged not generated
- Linked by case number to JMS
- ROA typically includes: judge identifier, attorneys' identifying information, lists all charges and disposition of case
- Importantly, ROA records if hearing was **removed from calendar** (e.g., pretrial was rescheduled)



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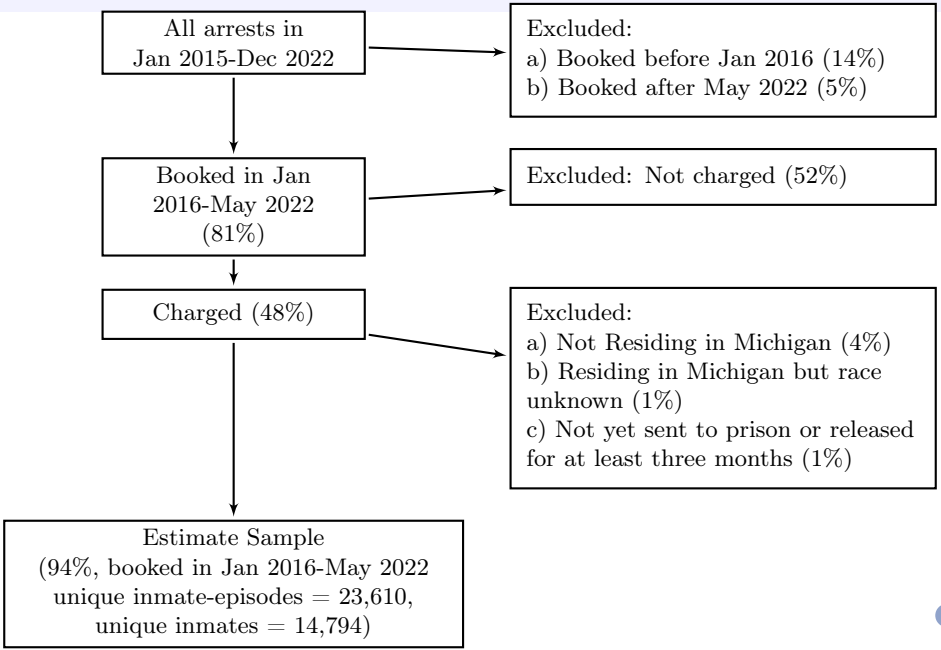
Sample Construction



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Data Integrity

Concern for reporting bias whenever using administrative data recorded by individuals within system (e.g., doctors, officers, etc.,)

- Selection into jail: Arresting officers (township police departments) differ from correctional officers
- Reporting of Recidivism: Arresting officers (township police departments) generally differ from correctional officers
- Reporting of Jail Incidents: Share of *major* incidents is constant over time
- Reporting of Medical events: Medical staff separate from correctional staff

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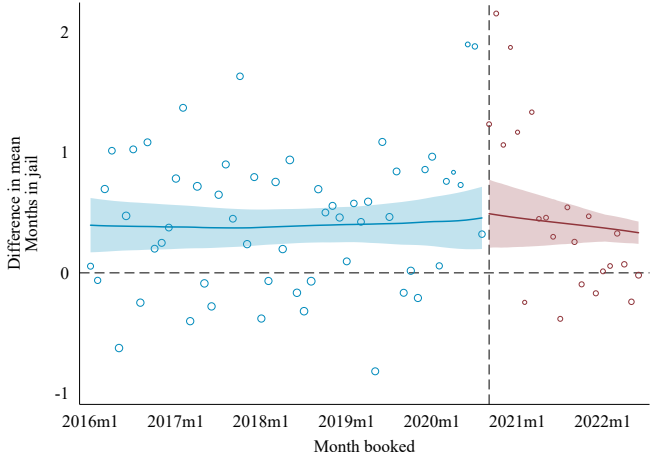
Rescheduling Effects on Months in Jail – First Stage



Notes: Dots indicate rescheduling effects on incarceration length for each booking month. The vertical dashed line indicates the beginning of IGNITE. Design controls are included.

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Difference-in-IV Approach

- For each individual i, let:
  - $Z_i \in \{0, 1\}$ indicate rescheduling
  - M_i^J count months in jail; M_i^I count months exposed to IGNITE
  - $P_i \in \{0, 1\}$ indicate post-IGNITE booking
  - Y_i be an outcome of interest (e.g. recidivism)

  Suppose that nobody booked pre-IGNITE was exposed: $M_i^I = M_i^J P_i$

- Simple causal model: $Y_i = Y_i(0) + \gamma M_i^J + \beta M_i^I$
  - $Y_i(0)$: potential outcome of individual i without additional time in jail
  - γ: effect of increased time in jail (pre-IGNITE)
  - β: IGNITE effect, holding fixed time in jail

- When Z_i is as-good-as-randomly assigned (i.e. independent of Y_i^0):

$$\beta = \underbrace{\frac{Cov(Z_i, Y_i \mid P_i = 1)}{Cov(Z_i, M_i^J \mid P_i = 1)}}_{\text{Post-IGNITE Rescheduling IV}} - \underbrace{\frac{Cov(Z_i, Y_i \mid P_i = 0)}{Cov(Z_i, M_i^J \mid P_i = 0)}}_{\text{Pre-IGNITE Rescheduling IV } (= \gamma)}$$

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Difference-in-IV Approach (Cont.)

Maintaining as-good-as-random assignment of Z_i (conditional on controls), we can relax other assumptions in the "diff-in-IV" approach:

- *Heterogeneous effects*: an average causal effect of IGNITE is identified when:
  - Rescheduling weakly increases time in jail for all individuals (monotonicity)
  - "Compliers" are similar pre- and post-IGNITE
- *Exclusion violations*: rescheduling can affect Y_i through other channels (*e.g.*, frustration) as long as the violations are similar pre- and post-IGNITE
  - IGNITE effect estimate is then still causal, but pre-IGNITE IV is not simply effect of additional time
- *Straddle population*: Individuals booked before IGNITE may be exposed
  - Motivates the two-treatment, two-instrument IV specification

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OLS Estimates: Main Outcomes

	Major Misconduct		Recidivism	
	(1)	(2)	(3)	(4)
Months in IGNITE	-0.001	-0.000	0.002	0.002
	(0.001)	(0.001)	(0.002)	(0.002)
Months in Jail	-0.002***	-0.002***	-0.006***	-0.007***
	(0.000)	(0.000)	(0.001)	(0.001)
Control Mean	0.314	0.314	0.421	0.421
Design Controls	Yes	Yes	Yes	Yes
Auxiliary Controls	No	Yes	No	Yes
Observations	23845	23845	22372	22372

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Continuous Outcome Measures

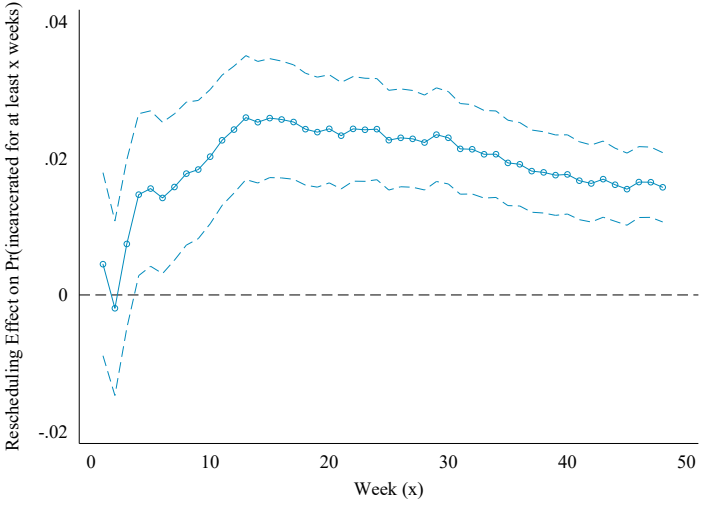
	Number of Major Misconduct		Number of Rebookings in 3 Months	
	(1)	(2)	(3)	(4)
Panel A: Reduced Form				
Any Rescheduling × Post-IGNITE	-0.070**	-0.068**	-0.044***	-0.045***
	(0.030)	(0.030)	(0.013)	(0.013)
Any Rescheduling	0.042***	0.041***	0.000	-0.001
	(0.013)	(0.013)	(0.007)	(0.007)
Panel B: 2SLS Estimates				
Months in IGNITE	-0.168**	-0.162**	-0.098***	-0.098***
	(0.068)	(0.068)	(0.037)	(0.036)
Months in Jail	0.158***	0.152***	0.017	0.012
	(0.044)	(0.042)	(0.033)	(0.031)
Months in IGNITE+Months in Jail	-0.010	-0.010	-0.081***	-0.086***
	(0.046)	(0.046)	(0.025)	(0.024)
Control Complier Mean	0.579	0.579	0.457	0.457
Design Controls	Yes	Yes	Yes	Yes
Auxiliary Controls	No	Yes	No	Yes
Observations	23845	23845	22372	22372

Differential Attrition

	Observed for 3 Months after Release	Observed for 6 Months after Release	Observed for 9 Months after Release	Observed for 12 Months after Release
	(1)	(2)	(3)	(4)
Any Delay	0.000	-0.001	-0.004***	-0.011***
	(0.000)	(0.001)	(0.001)	(0.002)
Control Mean	1.000	0.998	0.995	0.976
Observations	23,610	23,610	23,610	23,610

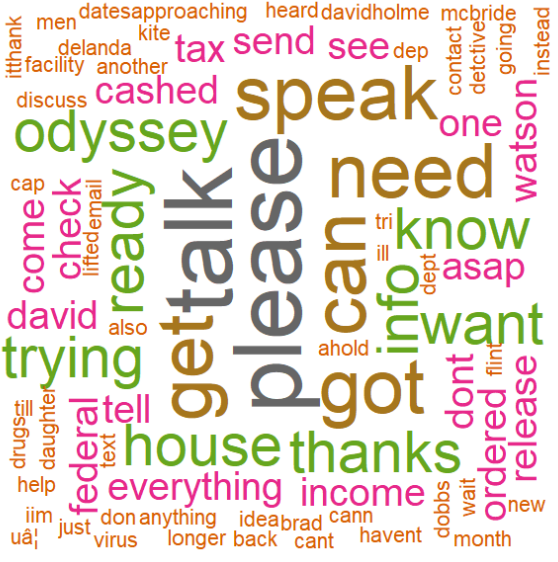
Balance
Effects over Time

First Stage Margins



Balance
First stage table

Jailed Individual's Texts (Kites): Post-Court Closure



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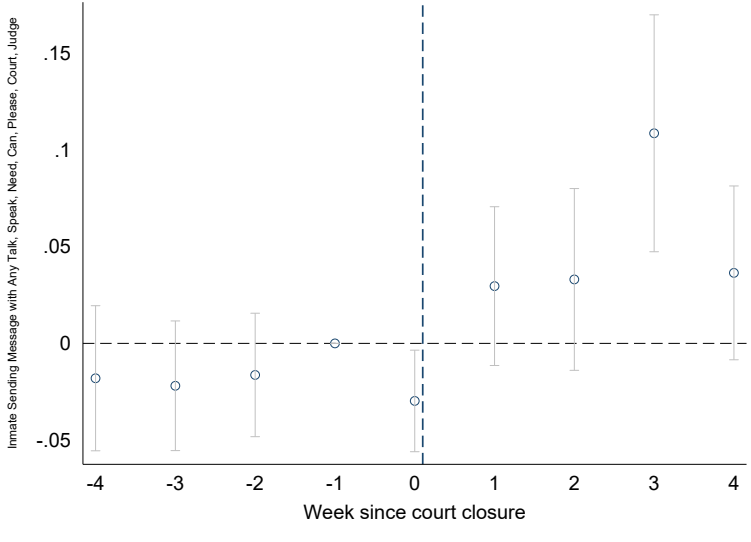
Related Word Usage in Texts, Pre- and Post-Closure



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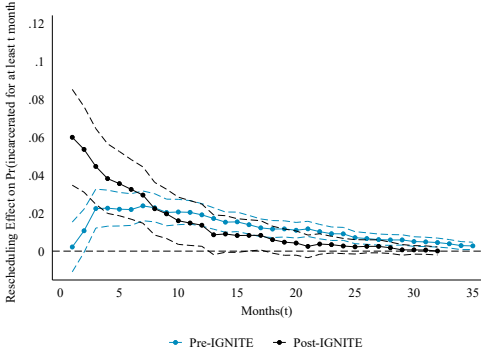
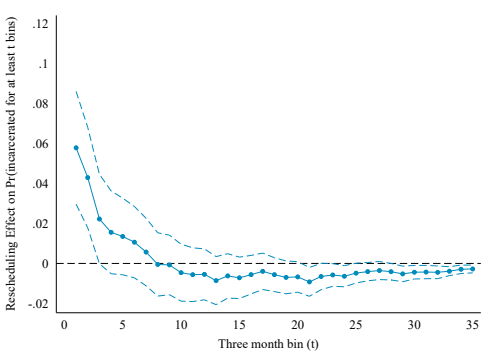
First Stage Margins by Pre- and Post-IGNITE



(a) IV Weights



(b) Difference in Weights

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Judge IV Estimates

	Misconduct		Recidivism	
	Pre-IGNITE	Post-IGNITE	Pre-IGNITE	Post-IGNITE
	(1)	(2)	(3)	(4)
Months in Jail	0.010	-0.011	0.073	-0.054**
	(0.026)	(0.024)	(0.062)	(0.024)
Post-Pre		-0.021		-0.127*
		(0.035)		(0.067)
Design Controls	Yes	Yes	Yes	Yes
Auxiliary Controls	Yes	Yes	Yes	Yes
Observations	19093	4751	17887	4484

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Judge IV Monotonicity + Exclusion Test

	Number of Spline Knots			
	1	2	3	4
	(1)	(2)	(3)	(4)
Panel A: Pre-IGNITE				
Test Statistic	32.4	31.9	31.1	30.9
Deg. of Freedom	17	16	15	14
p-value	0.013	0.010	0.008	0.006
Panel B: Post-IGNITE				
Test Statistic	27.8	24.6	23.8	25.3
Deg. of Freedom	14	13	12	11
p-value	0.019	0.020	0.019	0.008
Panel C: Overall				
Test Statistic	50.2	48.7	50.6	50.5
Deg. of Freedom	17	16	15	14
p-value	<0.001	<0.001	<0.001	<0.001

Notes: Test statistics based on quadratic b-spline estimates of the relationship between recidivism outcomes and judge stringency, following Frandsen et al. (2023), with the number of knots specified in each column. All specifications include design controls.

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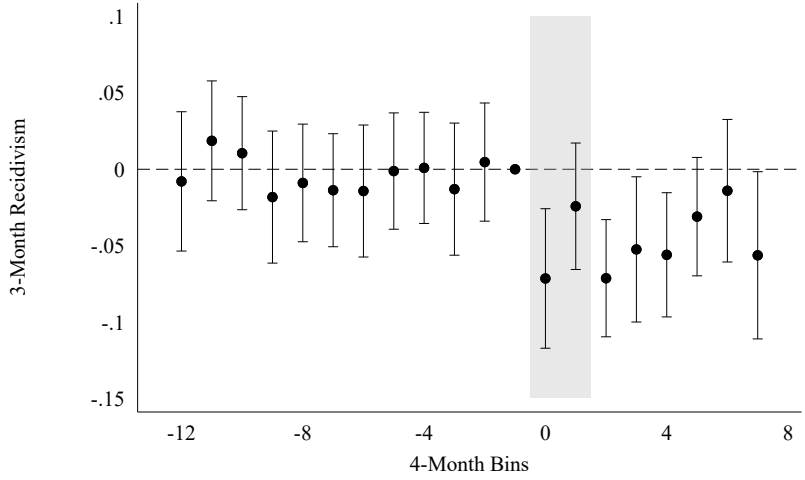
Genesee vs. Saginaw DiD



Notes: Event study regression of three-month recidivism comparing Genesee and Saginaw Counties. The unit of time periods is four months. The base period is Dec 2019. No additional controls are included.

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Robustness Checks

	Misconduct (1)	Recidivism (2)
Baseline Specification	-0.160***	-0.081***
($N = 23,610$)	(0.041)	(0.032)
High Predicted Risk Sample	-0.123*	-0.247**
($N = 5,810$)	(0.064)	(0.101)
Misconduct not Involving Others	-0.048***	
($N = 23,610$)	(0.012)	
Time Trend × Delay Control	-0.069***	-0.101***
($N = 23,610$)	(0.018)	(0.025)
Excluding COVID Period	-0.108***	-0.103**
($N = 20,658$)	(0.073)	(0.081)
Including Circuit Court Delay	-0.223*	-0.151**
($N = 23,610$)	(0.120)	(0.070)
COVID/Fiscal Crisis Delays Only	-0.078*	-0.091*
($N = 23,610$)	(0.047)	(0.050)
Multiple Delays per Day	-0.163***	-0.094***
($N = 23,610$)	(0.043)	(0.035)
Multiple Delay Events Control	-0.098***	-0.088**
($N = 23,610$)	(0.028)	(0.036)
Non-IGNITE Hours Misconduct	-0.127***	
($N = 23,610$)	(0.039)	

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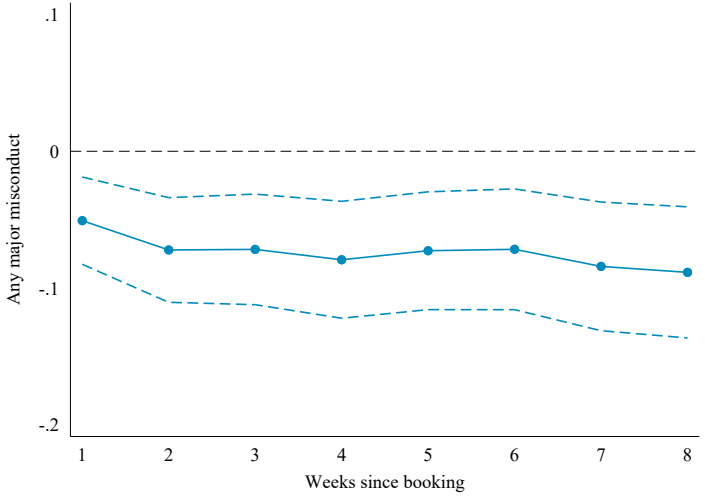
Misconduct Effects by Week



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Secondary Outcomes

	Months in IGNITE (1)	Months in Jail (2)
Panel A: Alternative Recidivism/Misconduct Measures		
Recharged	-0.060***	0.013
($N = 22,191$)	(0.027)	(0.014)
Reconvicted	-0.051**	0.028
($N = 22,191$)	(0.021)	(0.018)
Minor Misconduct	-0.021**	0.011***
($N = 23,610$)	(0.010)	(0.004)
Panel B: Other Outcomes		
Tether	0.002	-0.000
($N = 23,610$)	(0.009)	(0.007)
Bail Posted	-0.078	0.154***
($N = 23,610$)	(0.053)	(0.048)
Sentenced to Prison	0.005	-0.024
($N = 23,610$)	(0.020)	(0.017)
Convicted	-0.048	0.190***
($N = 23,610$)	(0.060)	(0.055)
Released to Rehab. Centers	-0.001	-0.003
($N = 23,610$)	(0.010)	(0.008)
Suicide	-0.008	-0.020
($N = 23,610$)	(0.030)	(0.022)
Other Medical	-0.041	-0.006
($N = 23,610$)	(0.040)	(0.027)

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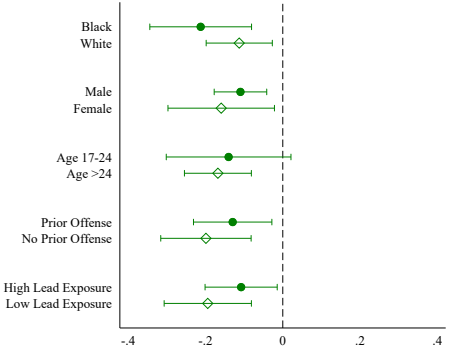
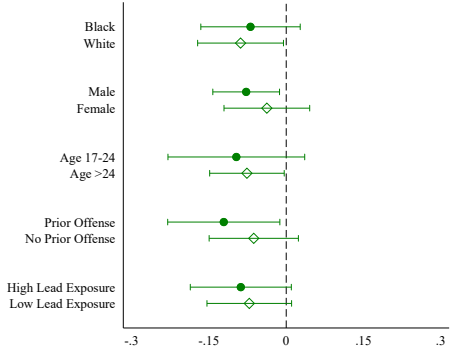
Heterogeneity by Demographics, Prior Offense, and Lead Exposure

(a) Months in IGNITE, Misconduct



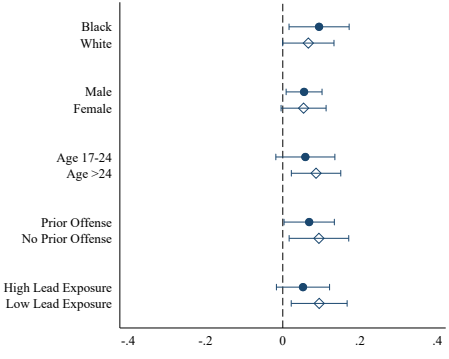
(b) Months in IGNITE, Recidivism



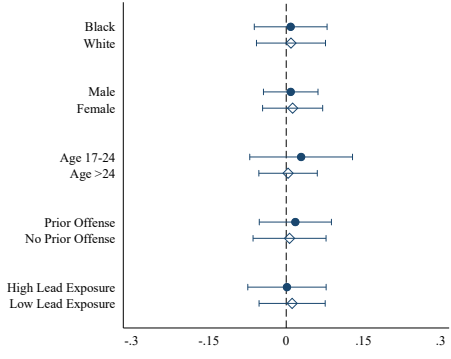
Robustness Checks More Results

Heterogeneity by Demographics, Prior Offense, and Lead Exposure

(a) Months in Jail, Misconduct



(b) Months in Jail, Recidivism



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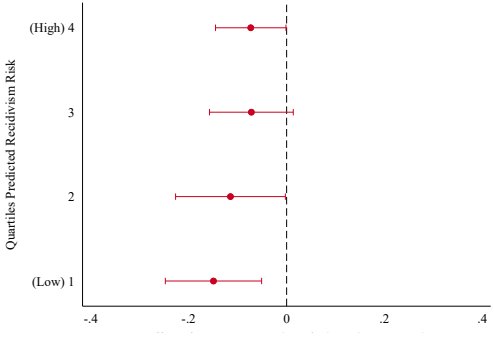
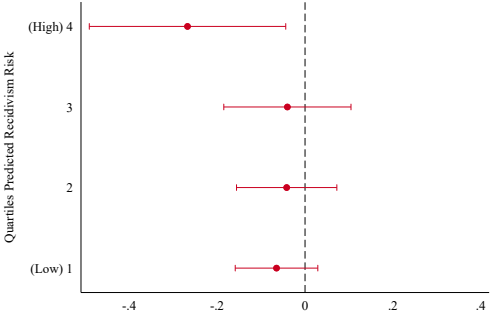
Heterogeneity: Predicted Recidivism Probability (IGNITE)



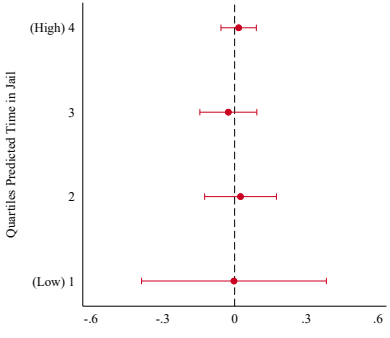
(a) Misconduct



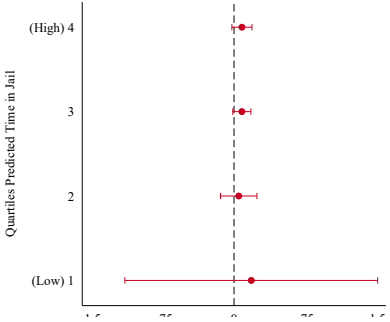
(b) Recidivism

Robustness Checks More Results

Heterogeneity: Predicted Time in Jail (Time in Jail)



(a) Misconduct



(b) Recidivism

Robustness Checks More Results