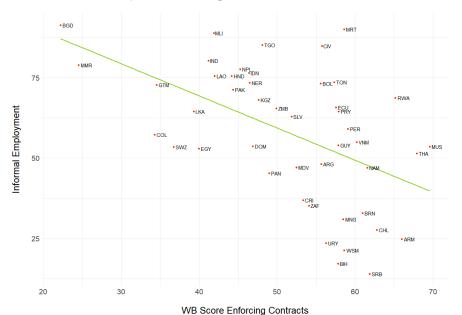
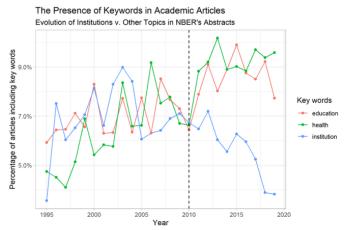
DE JURE (Data and Evidence for Justice Reform)

Innovations in Data with Policy Implications

# Economic development & legal institutions are associated



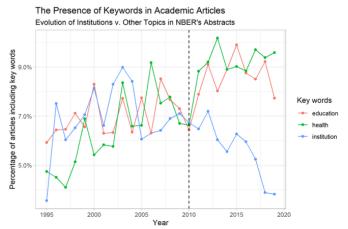
## RESEARCH ON "INSTITUTIONS" HAS DECLINED PERSISTENTLY IN RECENT YEARS



Source: data scraped by the authors from NBER's website. It contains the abstracts from all of the articles published up to November 2019

EXPANSION OF EXPERIMENTAL METHODS FOR CAUSAL INFERENCE
RELGATING RULE OF LAW AND COURTS TO A SECONDARY POSITION

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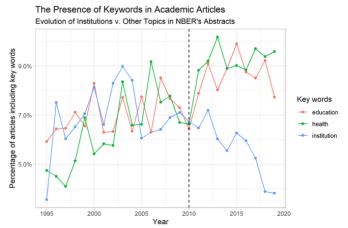


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EXPANSION OF EXPERIMENTAL METHODS FOR CAUSAL INFERENCE, RELGATING RULE OF LAW AND COURTS TO A SECONDARY POSITION

- Rule of Law ⇒ Contract Enforcement ⇒ Economic Growth
  - Firm-to-firm trade
    - \* Chemin 2012
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- Disclosure laws are associated with less corruption
  - Djankov et al., 2010
- Auditing reduces corruption
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  - Acemoglu et al. 2018; Di Tella et al. 2007

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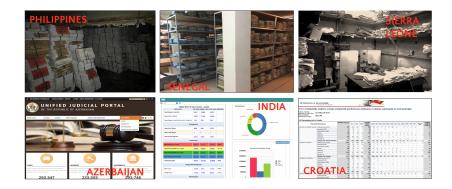
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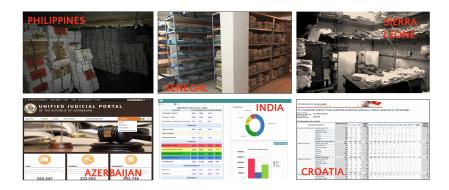
#### **Country Specific Examples of Our Work** CZECH REPUBLIC & CROATIA: · Prisoner survey of perceptions of legitimacy and beliefs on sanctions · Impact of justice on firm outcomes **PAKISTAN & BANGLADESH** · App-based reporting of and norm interventions on gender based violence BRAZII · · Impact of legal predictions, what is trustworthy Al · Impact of legal rulings and impact of politics on courts PERU: · Judicial training, theory vs. casebased teaching, social-emotional INDIA: learning interventions · Courts and informality, impact of · Impact of chatbots and search legal rulings on environment algorithms for legal knowledge · Missing cases and gender based violence SENEGAL & KENYA: · Measuring textual slant and the CHILE: · Behavioral interventions to reduce court backlogs Behavioral interventions in dashboards. · Machine Learning to identify judicial to improve judicial efficiency and fairness hiases · Mobile justice and e-arbitration · Evaluating the impact of procedural · Impact of COVID-19 on interrupted reforms on the speed of justice iustice Impact of Electronic Processing Law on

We run law and development RCTs through relationships with government partners who link legal cases to downstream effects for individuals and firms.

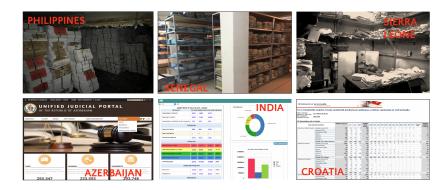
efficiency and access to justice



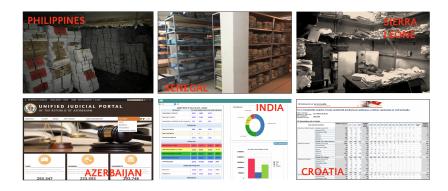
- Recent innovations have opened up new opportunities for delivery of justice
  - Increasingly digitized large-scale datasets
  - ML applications to produce interpretable data from unstructured text
  - ▶ Predictive models of decision-making to better understand biases and address them with digital interfaces



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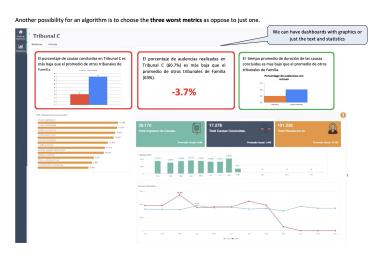
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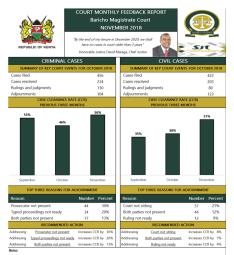
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## Personalized Interventions

This kind of data can be used to personalize interfaces for judges.



# Recommending Actions



Case Clearance Rate (CCR)- Case Clearance Rate (Resolved + Filed) × 100 measures the extent to which the court system is able to dispose of cases relative to the cases filed within a specified time period. A desarrance rate of 100% implies that the court is coping with its workload. More than 100% clearance rate indicates that the court is reducing its case basiding while its barth 100% intends that the court is courculating more case.

Resolved Case (RC) - Any case where a judgement or a final ruling closing the case has been made at the end of period under reference. It also means a finalized

Filed Cases (FC)- Any case that is registered in court of law for arbitration in a given period.

- Nation-wide experiment using the first digitized daily court records
  - Developed an algorithm to identify the greatest source of court delays
  - ► T1: provide actionable information
  - ► T2: + accountability (one-pager also sent to Court User Committees)
  - Control: status quo (no information), RCT across all 124 court stations

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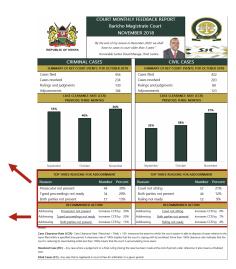
## Data-Driven Recommendations

# Efficiency in Kenya:

Can low cost, 'actionable' information improve performance?

| TOP THREE REASONS FOR ADJOURNMENT |        |         |  |  |  |  |
|-----------------------------------|--------|---------|--|--|--|--|
| Reason                            | Number | Percent |  |  |  |  |
| Prosecutor not present            | 44     | 30%     |  |  |  |  |
| Typed proceedings not ready       | 34     | 20%     |  |  |  |  |
| Both parties not present          | 17     | 13%     |  |  |  |  |

| RECOMMENDED ACTION |                             |                  |     |  |  |  |
|--------------------|-----------------------------|------------------|-----|--|--|--|
| Addressing         | Prosecutor not present      | increases CCR by | 30% |  |  |  |
| Addressing         | Typed proceedings not ready | increases CCR by | 20% |  |  |  |
| Addressing         | Both parties not present    | increases CCR by | 13% |  |  |  |



# Accountability reduced adjournments

## .. especially initiated by external parties (potentially frivolous)

|                                | Adjournment | External<br>Adjournment | Internal<br>Adjournment |
|--------------------------------|-------------|-------------------------|-------------------------|
| OnePager * February 2019       | -0.014      | -0.017                  | 0.000065                |
|                                | (0.012)     | (0.011)                 | (0.0043)                |
| OnePager CUC * February 2019   | -0.031**    | -0.030**                | -0.0042                 |
|                                | (0.015)     | (0.013)                 | (0.0043)                |
| OnePager * March 2019          | 0.0016      | 0.0028                  | -0.00028                |
| _                              | (0.013)     | (0.011)                 | (0.0041)                |
| OnePager CUC * March 2019      | -0.017      | -0.022*                 | 0.0014                  |
| _                              | (0.015)     | (0.011)                 | (0.0040)                |
| OnePager * April 2019          | -0.012      | -0.0044                 | -0.0076                 |
|                                | (0.014)     | (0.012)                 | (0.0063)                |
| OnePager CUC * April 2019      | -0.025      | -0.023*                 | -0.0070                 |
|                                | (0.016)     | (0.012)                 | (0.0063)                |
| OnePager * May 2019            | 0.012       | 0.018                   | -0.0020                 |
| -                              | (0.017)     | (0.015)                 | (0.0053)                |
| OnePager CUC * May 2019        | -0.013      | -0.012                  | -0.0026                 |
| -                              | (0.017)     | (0.015)                 | (0.0049)                |
| OnePager * After June 2019     | 0.0058      | 0.0064                  | 0.00013                 |
| _                              | (0.014)     | (0.012)                 | (0.0038)                |
| OnePager CUC * After June 2019 | -0.0070     | -0.015                  | -0.00027                |
|                                | (0.016)     | (0.013)                 | (0.0043)                |
| OnePager * Month Before        | -0.0089     | -0.0030                 | -0.0069                 |
|                                | (0.013)     | (0.0091)                | (0.0053)                |
| OnePager CUC * Month Before    | -0.0074     | -0.010                  | -0.0084                 |
|                                | (0.013)     | (0.011)                 | (0.0053)                |
| Observations                   | 6162668     | 6399868                 | 6399868                 |

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| OnePager CUC * Month Before    | -0.0074     | -0.010                  | -0.0084                 |
|                                | (0.013)     | (0.011)                 | (0.0053)                |
| Observations                   | 6162668     | 6399868                 | 6399868                 |

• Effect size of 3% are large relative to baseline of 18%

# Accountability mechanism

|                                 |          |          |          |          | Same as on<br>One-Pager | Different as on<br>One-Pager |
|---------------------------------|----------|----------|----------|----------|-------------------------|------------------------------|
| OnePager * February 2019        | -0.014   | -0.0086  | -0.013   | -0.014   | -0.015*                 | 0.0019                       |
| Oner ager Teordary 2010         | (0.012)  | (0.012)  | (0.012)  | (0.012)  | (0.0085)                | (0.0090)                     |
| OnePager CUC * February 2019    | -0.031** | -0.025*  | -0.031** | -0.031** | -0.020**                | -0.0086                      |
| Oner ager coc Tebruary 2015     | (0.015)  | (0.014)  | (0.014)  | (0.015)  | (0.0092)                | (0.010)                      |
| OnePager * March 2019           | 0.0016   | 0.0098   | 0.0025   | 0.0016   | -0.0035                 | 0.0088                       |
| Oner ager March 2010            | (0.013)  | (0.014)  | (0.013)  | (0.013)  | (0.0083)                | (0.0094)                     |
| OnePager CUC * March 2019       | -0.017   | -0.015   | -0.018   | -0.017   | -0.015*                 | -0.0035                      |
| oner ager coc march 2010        | (0.015)  | (0.014)  | (0.015)  | (0.015)  | (0.0081)                | (0.010)                      |
| OnePager * April 2019           | -0.012   | -0.0045  | -0.011   | -0.012   | -0.010                  | 0.00025                      |
| oner ager Tipin 2010            | (0.014)  | (0.013)  | (0.014)  | (0.014)  | (0.010)                 | (0.010)                      |
| OnePager CUC * April 2019       | -0.025   | -0.031** | -0.025   | -0.025   | -0.019*                 | -0.0068                      |
| Oner ager CCC April 2013        | (0.016)  | (0.015)  | (0.016)  | (0.016)  | (0.010)                 | (0.011)                      |
| OnePager * May 2019             | 0.012    | 0.0021   | 0.012    | 0.012    | -0.0018                 | 0.028**                      |
| 51161 ages 111a, 2010           | (0.017)  | (0.015)  | (0.017)  | (0.017)  | (0.014)                 | (0.014)                      |
| OnePager CUC * May 2019         | -0.013   | -0.021   | -0.017   | -0.013   | -0.012                  | 0.0044                       |
| onerager coco may 2010          | (0.017)  | (0.016)  | (0.017)  | (0.017)  | (0.014)                 | (0.012)                      |
| OnePager * After June 2019      | 0.0058   | -0.00039 | 0.0074   | 0.0058   | -0,00068                | 0.014                        |
| Oner ager Priver state 2015     | (0.014)  | (0.014)  | (0.014)  | (0.014)  | (0.0094)                | (0.014)                      |
| OnePager CUC * After June 2019  | -0.0070  | -0.015   | -0.0089  | -0.0070  | -0.0100                 | 0.00057                      |
| Oner ager CCC Triter valie 2015 | (0.016)  | (0.017)  | (0.016)  | (0.016)  | (0.010)                 | (0.011)                      |
| OnePager * Month Before         | -0.0089  | -0.00032 | -0.0078  | -0.0089  | -0.0035                 | -0.0025                      |
| Oner ager Month Delore          | (0.013)  | (0.013)  | (0.013)  | (0.013)  | (0.0082)                | (0.0096)                     |
| OnePager CUC * Month Before     | -0.0074  | -0.0025  | -0.0070  | -0.0074  | -0.011                  | 0.0040                       |
| oner ager ever month before     | (0.013)  | (0.014)  | (0.013)  | (0.013)  | (0.0093)                | (0.011)                      |
| Judge Fixed Effects             | (5.510)  | Yes      | (5.510)  | (5.510)  | (5.5000)                | (5.011)                      |
| Case Code Fixed Effects         |          | - 00     | Yes      |          |                         |                              |
| Controls                        |          |          | 200      | Yes      |                         |                              |
| Observations                    | 6162668  | 5088644  | 6058820  | 6162668  | 6399868                 | 6399868                      |

- Evidence of judicial learning
- .. from the One-Pager

# Accountability mechanism

|                                |          |          |          |          | Same as on<br>One-Pager | Different as on<br>One-Pager |
|--------------------------------|----------|----------|----------|----------|-------------------------|------------------------------|
| OnePager * February 2019       | -0.014   | -0.0086  | -0.013   | -0.014   | -0.015*                 | 0.0019                       |
|                                | (0.012)  | (0.012)  | (0.012)  | (0.012)  | (0.0085)                | (0.0090)                     |
| OnePager CUC * February 2019   | -0.031** | -0.025*  | -0.031** | -0.031** | -0.020**                | -0.0086                      |
|                                | (0.015)  | (0.014)  | (0.014)  | (0.015)  | (0.0092)                | (0.010)                      |
| OnePager * March 2019          | 0.0016   | 0.0098   | 0.0025   | 0.0016   | -0.0035                 | 0.0088                       |
| _                              | (0.013)  | (0.014)  | (0.013)  | (0.013)  | (0.0083)                | (0.0094)                     |
| OnePager CUC * March 2019      | -0.017   | -0.015   | -0.018   | -0.017   | -0.015*                 | -0.0035                      |
| _                              | (0.015)  | (0.014)  | (0.015)  | (0.015)  | (0.0081)                | (0.010)                      |
| OnePager * April 2019          | -0.012   | -0.0045  | -0.011   | -0.012   | -0.010                  | 0.00025                      |
|                                | (0.014)  | (0.013)  | (0.014)  | (0.014)  | (0.010)                 | (0.010)                      |
| OnePager CUC * April 2019      | -0.025   | -0.031** | -0.025   | -0.025   | -0.019*                 | -0.0068                      |
|                                | (0.016)  | (0.015)  | (0.016)  | (0.016)  | (0.010)                 | (0.011)                      |
| OnePager * May 2019            | 0.012    | 0.0021   | 0.012    | 0.012    | -0.0018                 | 0.028**                      |
|                                | (0.017)  | (0.015)  | (0.017)  | (0.017)  | (0.014)                 | (0.014)                      |
| OnePager CUC * May 2019        | -0.013   | -0.021   | -0.017   | -0.013   | -0.012                  | 0.0044                       |
|                                | (0.017)  | (0.016)  | (0.017)  | (0.017)  | (0.014)                 | (0.012)                      |
| OnePager * After June 2019     | 0.0058   | -0.00039 | 0.0074   | 0.0058   | -0.00068                | 0.014                        |
|                                | (0.014)  | (0.014)  | (0.014)  | (0.014)  | (0.0094)                | (0.010)                      |
| OnePager CUC * After June 2019 | -0.0070  | -0.015   | -0.0089  | -0.0070  | -0.0100                 | 0.00057                      |
|                                | (0.016)  | (0.017)  | (0.016)  | (0.016)  | (0.010)                 | (0.011)                      |
| OnePager * Month Before        | -0.0089  | -0.00032 | -0.0078  | -0.0089  | -0.0035                 | -0.0025                      |
| · ·                            | (0.013)  | (0.013)  | (0.013)  | (0.013)  | (0.0082)                | (0.0096)                     |
| OnePager CUC * Month Before    | -0.0074  | -0.0025  | -0.0070  | -0.0074  | -0.011                  | 0.0040                       |
| _                              | (0.013)  | (0.014)  | (0.013)  | (0.013)  | (0.0093)                | (0.011)                      |
| Judge Fixed Effects            |          | Yes      |          |          |                         |                              |
| Case Code Fixed Effects        |          |          | Yes      |          |                         |                              |
| Controls                       |          |          |          | Yes      |                         |                              |
| Observations                   | 6162668  | 5088644  | 6058820  | 6162668  | 6399868                 | 6399868                      |

## • Evidence of judicial learning

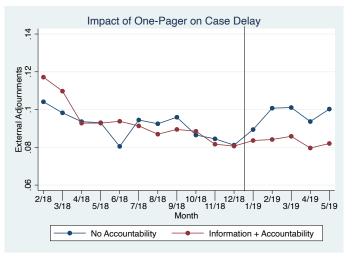
• .. from the One-Pager

# Accountability mechanism

|                                |          |          |          |          | Same as on<br>One-Pager | Different as on<br>One-Pager |
|--------------------------------|----------|----------|----------|----------|-------------------------|------------------------------|
| OnePager * February 2019       | -0.014   | -0.0086  | -0.013   | -0.014   | -0.015*                 | 0.0019                       |
| ,                              | (0.012)  | (0.012)  | (0.012)  | (0.012)  | (0.0085)                | (0.0090)                     |
| OnePager CUC * February 2019   | -0.031** | -0.025*  | -0.031** | -0.031** | -0.020**                | -0.0086                      |
| ,                              | (0.015)  | (0.014)  | (0.014)  | (0.015)  | (0.0092)                | (0.010)                      |
| OnePager * March 2019          | 0.0016   | 0.0098   | 0.0025   | 0.0016   | -0.0035                 | 0.0088                       |
| 0                              | (0.013)  | (0.014)  | (0.013)  | (0.013)  | (0.0083)                | (0.0094)                     |
| OnePager CUC * March 2019      | -0.017   | -0.015   | -0.018   | -0.017   | -0.015*                 | -0.0035                      |
| 9                              | (0.015)  | (0.014)  | (0.015)  | (0.015)  | (0.0081)                | (0.010)                      |
| OnePager * April 2019          | -0.012   | -0.0045  | -0.011   | -0.012   | -0.010                  | 0.00025                      |
| •                              | (0.014)  | (0.013)  | (0.014)  | (0.014)  | (0.010)                 | (0.010)                      |
| OnePager CUC * April 2019      | -0.025   | -0.031** | -0.025   | -0.025   | -0.019*                 | -0.0068                      |
|                                | (0.016)  | (0.015)  | (0.016)  | (0.016)  | (0.010)                 | (0.011)                      |
| OnePager * May 2019            | 0.012    | 0.0021   | 0.012    | 0.012    | -0.0018                 | 0.028**                      |
| •                              | (0.017)  | (0.015)  | (0.017)  | (0.017)  | (0.014)                 | (0.014)                      |
| OnePager CUC * May 2019        | -0.013   | -0.021   | -0.017   | -0.013   | -0.012                  | 0.0044                       |
| •                              | (0.017)  | (0.016)  | (0.017)  | (0.017)  | (0.014)                 | (0.012)                      |
| OnePager * After June 2019     | 0.0058   | -0.00039 | 0.0074   | 0.0058   | -0.00068                | 0.014                        |
|                                | (0.014)  | (0.014)  | (0.014)  | (0.014)  | (0.0094)                | (0.010)                      |
| OnePager CUC * After June 2019 | -0.0070  | -0.015   | -0.0089  | -0.0070  | -0.0100                 | 0.00057                      |
|                                | (0.016)  | (0.017)  | (0.016)  | (0.016)  | (0.010)                 | (0.011)                      |
| OnePager * Month Before        | -0.0089  | -0.00032 | -0.0078  | -0.0089  | -0.0035                 | -0.0025                      |
|                                | (0.013)  | (0.013)  | (0.013)  | (0.013)  | (0.0082)                | (0.0096)                     |
| OnePager CUC * Month Before    | -0.0074  | -0.0025  | -0.0070  | -0.0074  | -0.011                  | 0.0040                       |
|                                | (0.013)  | (0.014)  | (0.013)  | (0.013)  | (0.0093)                | (0.011)                      |
| Judge Fixed Effects            |          | Yes      |          |          |                         |                              |
| Case Code Fixed Effects        |          |          | Yes      |          |                         |                              |
| Controls                       |          |          |          | Yes      |                         |                              |
| Observations                   | 6162668  | 5088644  | 6058820  | 6162668  | 6399868                 | 6399868                      |

- Evidence of judicial learning
- .. from the One-Pager

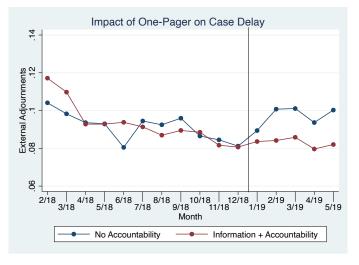
# Accountability Persistence



Starting after Covid, will become monthly

ADVICE IS TOP-DOWN BASED ON DATA ALREADY COLLECTED

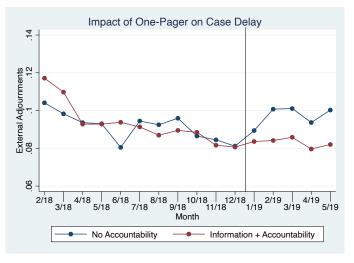
### Accountability Persistence



Starting after Covid, will become monthly

Advice is top-down based on data already collected

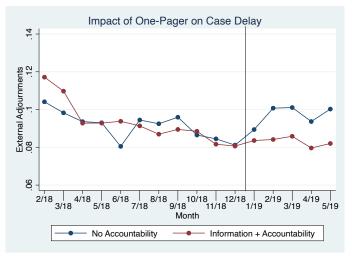
### Accountability Persistence



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ADVICE IS TOP-DOWN BASED ON DATA ALREADY COLLECTED

### Accountability Persistence

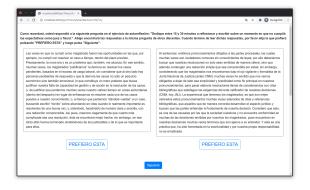


Starting after Covid, will become monthly

Advice is top-down based on data already collected can we help countries generate their own better policies?

#### Self Reflection

#### Social-Emotional Learning Exercises - Advice Giving & Grading

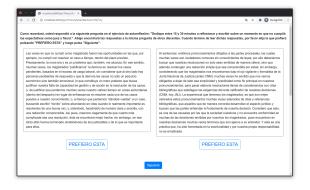


See also Eskreis-Winkler, Milkman, Gromet, Duckworth, PNAS 2019

10 months-long intervention

#### Self Reflection

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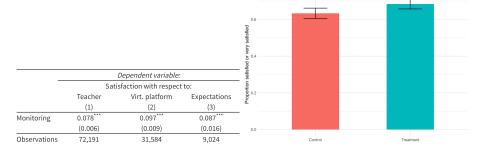


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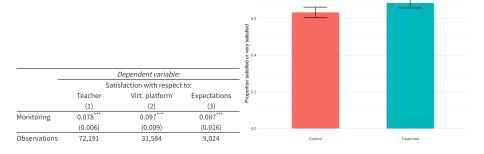
## Community of Practice (Etienne Wenger)

#### Monitoring & Debriefing of Teachers Improves Student Satisfaction



### Community of Practice (Etienne Wenger)

### Monitoring & Debriefing of Teachers Improves Student Satisfaction



## Community of Practice (Etienne Wenger)

.. and affects implicit attitudes (in a debiasing manner)

| _                          | Dependent variable: |  |
|----------------------------|---------------------|--|
|                            | IAT score           |  |
| Prop. of courses monitored | 0.092**             |  |
|                            | (0.041)             |  |
| Constant                   | -0.216***           |  |
|                            | (0.026)             |  |
| Observations               | 286                 |  |

Increased distance from self  $\Rightarrow$  more self control  $\Rightarrow$  wisdom in reasoning attitudes, and behavior

- Personalized: Take 15-30 minutes to give advice to someone who is starting a new judge or prosecutor position like yours.
- **Generalized**: Take 15-30 minutes to write about some legal issues that new judges or prosecutors should know better.
- Topic 2: Reflection Reflect on a value that is important to you / others (efficiency, fairness, ..)
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#### Topic 1: Advice

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#### Topic 2: Reflection - Reflect on a value that is important to you / others (efficiency, fairness, ..)

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# Self-Distancing Increased Satisfaction and Grades

|              | Dananda                          | Dependent variable: |              | Dependent variable |             |
|--------------|----------------------------------|---------------------|--------------|--------------------|-------------|
|              |                                  |                     |              | Final              | Final grade |
|              | Satisfaction with respect to tea |                     | er           | instrumental       | OLS         |
|              | instrumental<br>variable         | OLS                 |              | variable           |             |
|              | variable<br>(1)                  | (2)                 |              | (1)                | (2)         |
| TOT          | 0.091***                         | (2)                 | TOT          | 0.292 <sup>*</sup> |             |
|              | (0.009)                          |                     |              | (0.177)            |             |
| ITT          | ,                                | 0.057***            | ITT          |                    | 0.120*      |
|              |                                  | (0.006)             |              |                    | (0.073)     |
| Observations | 61,119                           | 61,119              | Observations | 1,749              | 1,749       |

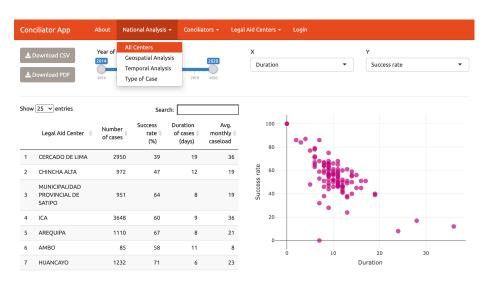
### Vocation, Advice, and Growth Mindset Affect IATs

|                           | Dependent variable: |  |
|---------------------------|---------------------|--|
|                           | IAT Score           |  |
| ocación                   | 0.068*              |  |
|                           | (0.037)             |  |
| ratitud                   | 0.020               |  |
|                           | (0.037)             |  |
| ijación_de_objetivos      | 0.017               |  |
|                           | (0.037)             |  |
| utoreconocimiento         | 0.002               |  |
|                           | (0.037)             |  |
| sesoramiento              | 0.079**             |  |
|                           | (0.036)             |  |
| uriosidad                 | -0.002              |  |
|                           | (0.038)             |  |
| utoreflexión              | 0.005               |  |
|                           | (0.037)             |  |
| espuesta_a_desafíos       | -0.027              |  |
|                           | (0.037)             |  |
| mpoderamiento             | -0.043              |  |
|                           | (0.037)             |  |
| nentalidad_de_crecimiento | 0.068*              |  |
|                           | (0.037)             |  |
| Constant                  | -0.261***           |  |
|                           | (0.060)             |  |
| bservations               | 300                 |  |

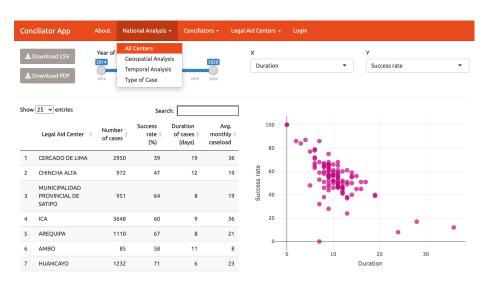
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|---------------------------|---------------------|--|
|                           | IAT Score           |  |
| vocación                  | 0.068*              |  |
|                           | (0.037)             |  |
| gratitud                  | 0.020               |  |
|                           | (0.037)             |  |
| fijación_de_objetivos     | 0.017               |  |
|                           | (0.037)             |  |
| utoreconocimiento         | 0.002               |  |
|                           | (0.037)             |  |
| sesoramiento              | 0.079**             |  |
|                           | (0.036)             |  |
| uriosidad                 | -0.002              |  |
|                           | (0.038)             |  |
| autoreflexión             | 0.005               |  |
|                           | (0.037)             |  |
| espuesta_a_desafíos       | -0.027              |  |
|                           | (0.037)             |  |
| mpoderamiento             | -0.043              |  |
|                           | (0.037)             |  |
| nentalidad_de_crecimiento | 0.068*              |  |
|                           | (0.037)             |  |
| Constant                  | -0.261***           |  |
|                           | (0.060)             |  |
| Observations              | 300                 |  |
| bservations               | 300                 |  |

### Recommending Actions to Each Other



### Recommending Actions to Each Other





Wiki-survey Structured Questions

Top mediators on any indicator to give advice A|B randomized to others which dynamically generates an automated policy causal inference machine



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#### API to create own dashboards



Victim's defense, public defense, psychological support



Record and present correlates of improvement

Transfer Learning within and across decision-makers

E-JUSTICE TOOLS LIKE THESE MEET SOCIAL DISTANCING NEEDS



Record and present correlates of improvement

Transfer learning within and across decision-makers

F-JUSTICE TOOLS LIKE THESE MEET SOCIAL DISTANCING NEEDS



Record and present correlates of improvement

Transfer learning within and across decision-makers

E-JUSTICE TOOLS LIKE THESE MEET SOCIAL DISTANCING NEEDS

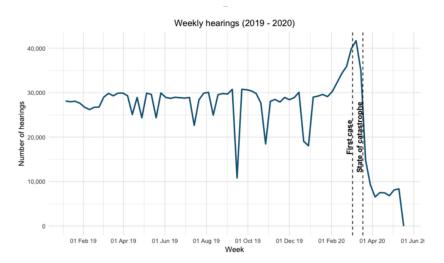


Record and present correlates of improvement

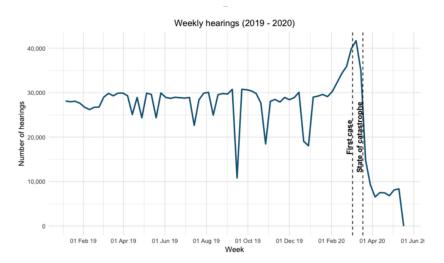
Transfer learning within and across decision-makers

E-justice tools like these meet social distancing needs

### Many countries experieced decrease in court activity

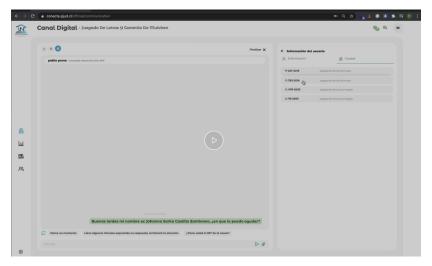


#### Many countries experieced decrease in court activity



#### How to facilitate justice amid covid?

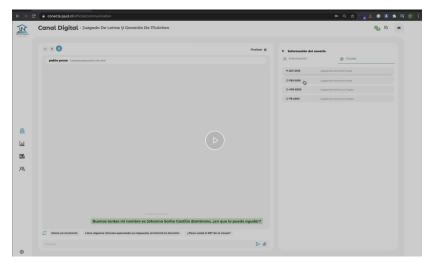
# E-Justice during covid: Whatsapp



for Q&A with courts

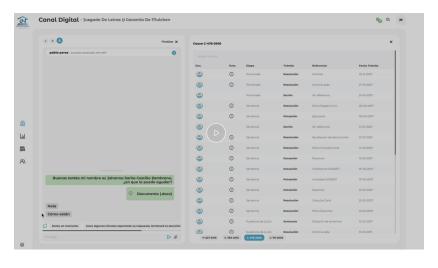
video and audio also enabled

## E-Justice during covid: Whatsapp



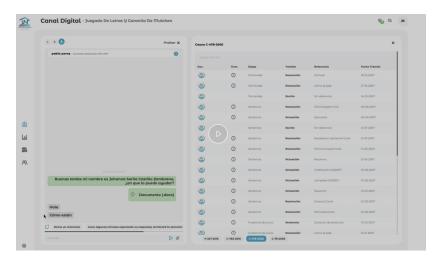
for Q&A with courts video and audio also enabled

### .. Receivers are given text to copy and paste (chatbots/humans?)



documents are linked

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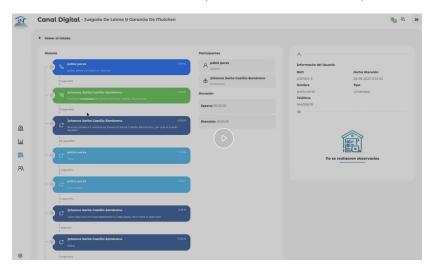
#### Cases are linked across calls

.. and into the courts (DIGITAL INTEROPERABILITY)



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.. and into the courts (DIGITAL INTEROPERABILITY)



FACILITATING DOWNSTREAM ANALYSIS ON CONSEQUENCES

# 40% of inquiries have been related to alimony

Pilot being rolled out nationally (and advertised on Facebook)



to improve speed of justice

E-justice Apps to speed up justice

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E-justice Apps to speed up justice

#### Interventions

- Chilean courts are affected by high imbalance of workload and little incentives to perform better.
- Telework aims to improve performance in congested courts by balancing the workload across courts, without incurring the costs of hiring new staff.
- Participants volunteer into an incentives scheme--receive benefits conditional on doing the extra work and on meeting performance targets.

## Research Design

- We use Randomized Controlled Trials (RCT) with treatments:
  - Providing Telework: administrative staffs and judges opt-in the program.
  - Receiving Telework: receive help from another tribunal at no extra cost.
- There are 41 blocks between composed of at least three tribunals of similar competence & jurisdiction.

Stage 1: mechanism to smooth variability across jurisdictions (daily, court-specific incentive)

Stage 2: mechanism to smooth variability across time within jurisdictions ('uber')

UBERIZATION ADDRESS CASES ACTUALLY FILED

WHAT ABOUT CASES THAT NEVER FILE?

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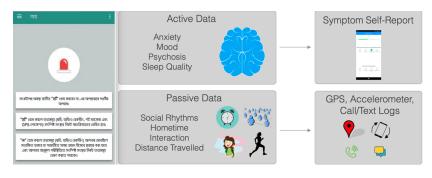
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What about cases that never file?

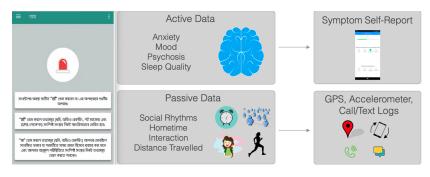
#### smartphone app aiming to address violence against women and children



- Emergency button sends the victim's GPS, picture, and audio recording
- Passive features for additional revealed preference data

What is the impact of speed of justice

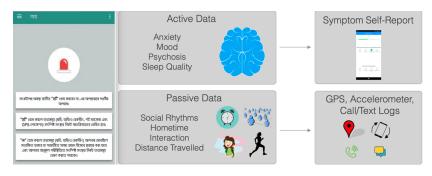
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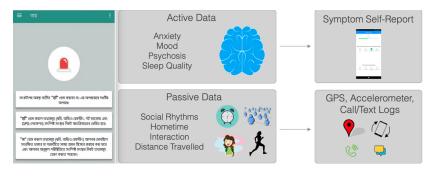
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What is the impact of speed of justice

## **Empirical Challenges**

#### Medicine, prior to clinical trials

Theories about the effects, but no causal evidence (a century ago)

#### Randomizing judicial decisions

Violates our notion of justice (equal treatment before the law)

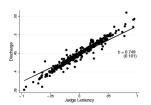
### Randomizing judicial assignment

Generates retrospective "clinical trial" (Kling AER 2006; many since "credibility revolution" in economics)

### Debt Relief and Debtor Outcomes (AER 2014)

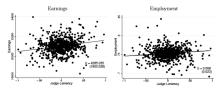
#### Cancelling debt causes †Earnings, †Employment, ↓Mortality, ↓Foreclosure

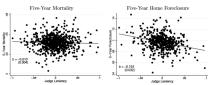
Figure 1 Chapter 13 Judge Leniency and Chapter 13 Bankruptcy Protection



Notes: This figure plots Chapter 13 discharge vs. our leave-one-out measure of judge leniency. The sample consists of all first-time Chapter 13 filers between 1992 and 2005 in the 42 offices that randomly assign filings to judges. Judge binned scatter plot, we first regress an indicator for discharge on office by month-of-filing fixed effects and calculate residuals. We then take the mean residual in each judge by year bin, adding the mean discharge rate to each residual to aid in the interpretation of the plot. The solid line shows the best linear fit estimated on the underlying micro data estimated using OLS. The coefficients show the estimated slope of the best-fit line including office by month-of-filing fixed effects, with standard errors clustered at the office level reported in parentheses.

Figure 3 Chapter 13 Judge Leniency and Labor Supply, Mortality, and Home Foreclosure



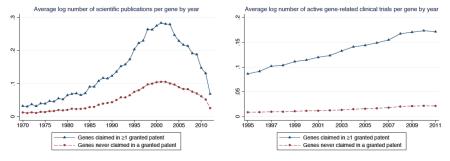


Notes: These figures plot earnings employment five-year mortality and five-year foreclosure vs. our leave-one-out measure of judge leniency. The earnings and mortality sample includes all first-time filings between 1992 and 2005 in the 42 offices that randomly assign cases to judges. The foreclosure sample includes the subset of those filings originating in county by year bins with foreclosure data coverage. Judge leniency is the leave-one-out mean rate of granting Chapter 13 bankruptcy protection for the assigned judge minus the leave-one-out mean rate of granting bankruptcy protection for the court in the same filing year. To construct the binned scatter plot, we first regress each outcome on office by month-of-filing fixed effects and calculate residuals. We then take the mean residual in each judge by year bin, adding the mean discharge rate to each residual to aid in the interpretation of the plot. The leniency is the leave-one-out mean rate of granting Chapter 13 bankruptcy protection for the assigned judge minus solid line shows the best linear fit estimated on the underlying micro data estimated using OLS. The coefficients the leave-one-out mean rate of granting bankruptcy protection for the court in the same filing year. To construct the show the estimated slope of the best-fit line including office by month-of-filing fixed effects, with standard errors clustered at the office level reported in parentheses. Farmings are winsorized at the top and bottom one percent Employment is an indicator for non-zero wage earnings on the W-2. All monetary values are expressed in real 2000 dollars. Mortality is an indicator for being deceased in or before the indicated year using information from the Death Master File. Foreclosure is an indicator for a filer's home receiving a notice of default, receiving a notice of transfer or sale, or being transferred to a REO or a guarantor in or before the indicated year.

### Patents and Innovation (AER 2019)

#### Patented genes are more valuable, but does patenting make them valuable?

Figure 1: Follow-on Innovation on Patented and Non-Patented Human Genes

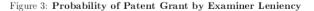


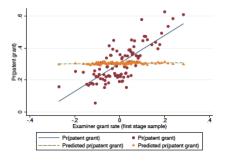
(a) Gene-Level Scientific Publications

(b) Gene-Level Clinical Trials

Notes: This figure plots trends in follow-on innovation by year separately for genes that ever receive a patent and for genes that never receive a patent. The figure is constructed from gene-level data. Panel (a) uses gene-level scientific publications as a measure of follow-on innovation, and plots the average log number of scientific publications by year in each year from 1970 to 2012. Panel (b) uses gene-level clinical trials as a measure of follow-on innovation, and plots the average log number of clinical trials by year in each year from 1995 to 2011.

## Patents examiners have strong habits

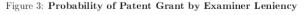


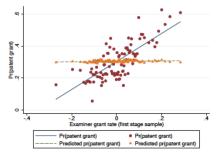


Notes: The figure relates our examiner leniency measure, residualized by Art Unit-by-application year fixed effects, to two variables:
(1) the patent grant rate and (2) the predicted patent grant rate, where we predict patent grant as a function of our two measures of patent value fixed at the time of application (patent family size and claims count). All measures are constructed in our first stage sample (N=14,476).

What is causal effect of patent protection on follow-on innovation?

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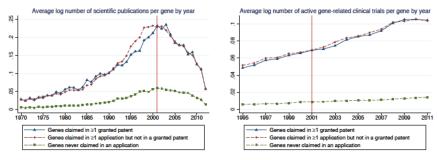




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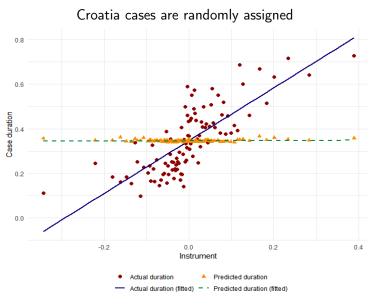
## Follow-on innovation similar for accepted & rejected patents

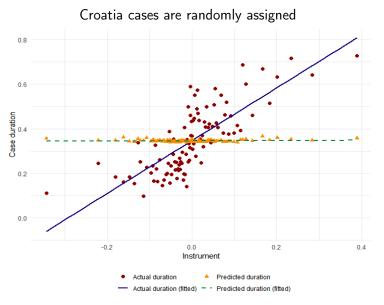


#### (b) Gene-Level Scientific Publications

#### (c) Gene-Level Clinical Trials

Notes: This figure plots trends in patenting and follow-on innovation by year separately for three groups of genes: genes claimed in at least one granted patent; genes claimed in at least one patent application but never in a granted patent; and (in Panels (b) and (c)) genes never claimed in a patent application. The figure is constructed from gene-level data. Panel (a) documents the share of genes receiving a patent grant by year; by construction, this is zero for the circle-denoted red dashed line in all years and reaches one for the triangle-denoted blue line in 2010; the intermediate years simply illustrate the time path of patent grants between 2001 and 2010 for the triangle-denoted blue line. Panel (b) uses gene-level scientific publications as a measure of follow-on innovation and plots the average log number of scientific publications by year in each year from 1970 to 2012. Panel (c) uses gene-level clinical trials as a measure of follow-on innovation and plots the average log number of clinical trials by year in each year from 1995 to 2011. The vertical line in the calendar year 2001 in Panels (b) and (c) denotes that, because this figure focuses on patents that were filed in or after November 2000, all years prior to 2001 can be considered a pre-period and used to estimate the selection of genes into patenting based on pre-patent filing measures of scientific research (publications) and commercialization (clinical trials).



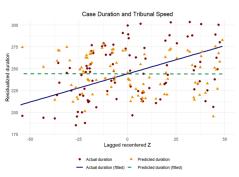


What is the causal effect of faster case resolution?

#### Preliminary evidence on Shortened bankruptcy proceedings

- Second stage: Being randomly allocated to a fast judge in 2015 significantly causes:
  - 1. current assets (2016) to increase by about 298%
  - 2. cash and cash equivalent balance (2016) to decrease by about 280%
  - 3. shareholder funds to increase by about 1,333%
  - 3. loans to decrease by about 269%
  - 4. value of debtors to decrease by about 164%

#### Chile cases are also randomly assigned to tribunals



Testing empirically the identification assumptions:

- Tribunal assignment matters for case duration: there is a steep positive correlation between tribunal speed and case duration (blue line)
- Tribunal assignment is random: there is no correlation between duration predicted by baseline case characteristics and tribunal speed (green dotted line)

# Impact of Speed of Justice

#### Preliminary evidence on Summary cases (smaller firms)

|                  | Log Sales |         |          |
|------------------|-----------|---------|----------|
|                  | t-1       | t0      | t+1      |
|                  | (1)       | (2)     | (3)      |
| Tribunal Speed   | -0.008    | 0.049   | 0.099*** |
|                  | (0.025)   | (0.034) | (0.034)  |
| 1st Stage F-stat | 41        | 41      | 41       |
| Y mean (level)   | 9.401     | 9.053   | 8.735    |

We are exploring similar research design anytime infrastructure permits

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### Random Variation in Precedent



- Random assignment of judges
  - Judge characteristics predict decisions
- Binding precedent within circuit
  - ▶ 98% of decisions are final

$$\begin{cases} Law_{ct} = \alpha_{ict} + \phi Z_{ct} + \gamma_1 X_{ict} + \gamma_2 W_{ct} + \eta_{ict} \text{ (machine learning step)} \\ Y_{ict} = \alpha_{ict} + \rho Law_{ct} + \beta_1 X_{ict} + \beta_2 W_{ct} + \varepsilon_{ict} \text{ (causal inference step)} \end{cases}$$

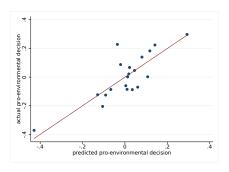
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# Impact of Environmental Decisions



Period (Year)

Effects of Pro-EPA on emissions - crossfoldIV

Calibration plot

Rulings in favor of EPA regulations reduce air pollution

# Impact of Criminal Appeals Decisions

Criminal defendants at district court level might appeal to appellate court. Appellate reversals of district court rulings are often in favor of the defendant. Causal channel:

Appellate judge characteristics  $W \to \text{Appellate reversal } D \to \text{Change in sentencing (months)} \ Y$ 

| Estimate | SE   | Wald             | Anderson-Rubin      | $\mathbb{R}^2$ | Estimator              |
|----------|------|------------------|---------------------|----------------|------------------------|
| -1.71    | 0.70 | [-3.08, -0.35]   | [-3.04, -0.23]      | 0.0199         | MLSS (Random Forest)   |
| 5.35     | 5.17 | [-4.78, 15.47] 7 | $[-\infty, \infty]$ | -0.0137        | Split-sample linear IV |

MLSS estimators can provide substantial gains to precision and robustness in applied research.

#### Automated policy causal inference

- 1. Identifying the nearest cases
  - 2. Fast decision classification
    - 3. Document embedding
- 4. Judge embedding using own corpora

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### India E-courts

|                                       | prev.<br>scrape | current<br>scrape | Δ     |
|---------------------------------------|-----------------|-------------------|-------|
| districts                             | 608             | 633               | + 04% |
| courts                                | 6292            | 7154              | + 14% |
| # of cases<br>2015-2018<br>all states | 40.95M          | 48.9M             | + 19% |

| year | prev. scrape | new scrape | merged      |
|------|--------------|------------|-------------|
| 2000 | 0.46M        | 0.53M      | calculating |
| 2001 | 0.71M        | 0.77M      | calculating |
| 2002 | 0.79M        | 0.92M      | calculating |
| 2003 | 0.97M        | 1.12M      | calculating |
| 2004 | 1.15M        | 1.31M      | calculating |
| 2005 | 1.49M        | 1.59M      | calculating |
| 2006 | 1.73M        | 1.92M      | calculating |
| 2007 | 1.86M        | 2.1M       | calculating |
| 2008 | 2.23M        | 2.49M      | calculating |
| 2009 | 2.69M        | 2.89M      | calculating |
| 2010 | 3.31M        | 3.47M      | calculating |
| 2011 | 2.22M        | 4.05M      | calculating |
| 2012 | 3.66M        | 4.92M      | calculating |
| 2013 | 7.26M        | 7.32M      | calculating |
| 2014 | 10.37M       | 10.21M     | calculating |
| 2015 | 8.29M        | 9.13M      | 10.74M      |
| 2016 | 10.88M       | 9.4M       | 12.03M      |
| 2017 | 10.8M        | 9.82M      | 12.83M      |
| 2018 | 10.98M       | 9.37M      | 13.3M       |
| 2019 | ОМ           | 8.59M      | 8.59M       |

- Impacts of law
  - linkages to litigant (firm or individual)
  - economic data, pollution, land disputes
- Impacts on law
  - elections, cognitive, incentive, movements
  - ▶ (politics, psychology, economics, social)
- Improving rule of law
  - court reforms, decision-support, transparency
- https://explore-ecourts.herokuapp.com/

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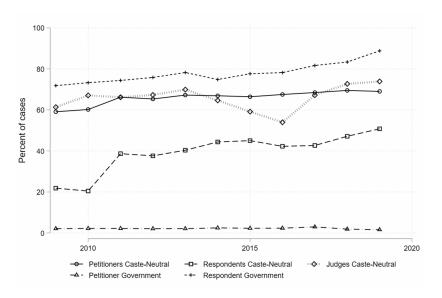
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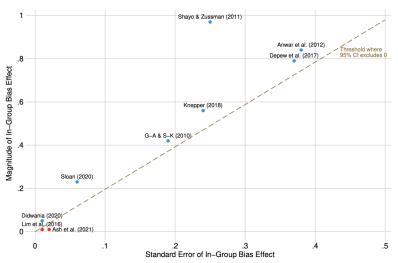
# (1) A window into social processes

#### Increasing salience of caste-neutral names



### (2) Is there in-group bias? If so where?

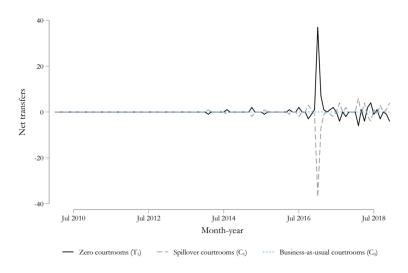
B. Standardized Errors vs. Effect Sizes



6M lower court criminal cases show little gender and religion in-group bias

# (3) Impact of "Zero" Courts

Figure 12: Density of transfers by month



# (3) Impact of Transfers

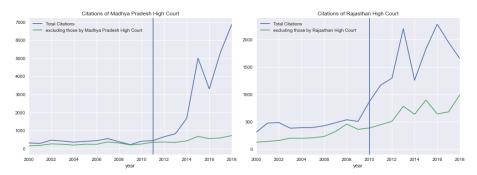
Transferred cases were 24% less likely to be disposed within 1 year

|                | Days     | Disposed      | Number of | Duration of |
|----------------|----------|---------------|-----------|-------------|
|                | in court | within 1 year | Hearings  | Hearings    |
| Judge changed  | 169*     | -0.24**       | 3.1*      | 83***       |
|                | (93)     | (.11)         | (1.8)     | (25)        |
| Mean dep. var. | 503      | 0.47          | 8.1       | 234         |
| Observations   | 601540   | 601775        | 600268    | 397902      |
| Month FE       | Υ        | Υ             | Υ         | Υ           |
| F-test p-value | .12      | .063          | .085      | .049        |



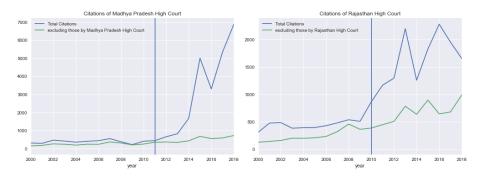
- on how cases are decided?
- speed of resolution?
- diversity of citations?
- memes?

Kanoon seemed to enable courts to cite themselves, as if Kanoon facilitated common law.



The impact of google on wikipedia is hard to know, since wikipedia didn't exist prior to google here, we can study common law, to see the polarization or democratization of knowledge

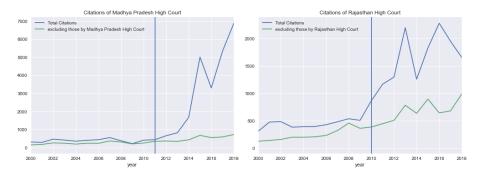
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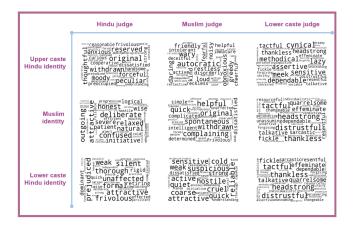
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## (5) Judicial Attitudes in Text

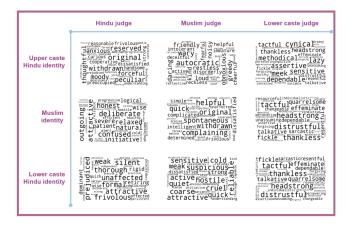


Preliminary evidence that Hindu judges describe the Hindu identity more positively

SC/ST judges describe Muslims more negatively

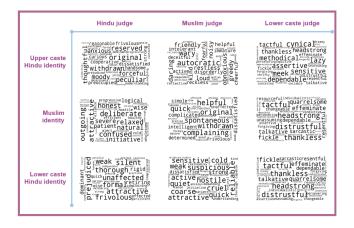
EMPATHY IS PROPOSED ANTIDOTE TO IN-GROUP BIAS

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### (5) Judicial Attitudes in Text

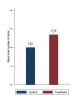


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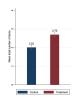
EMPATHY IS PROPOSED ANTIDOTE TO IN-GROUP BIAS

- The Pakistan civil service is interested in teaching empathy to elite civil servants (250 selected out of 15000 test-takers annually).
- Empathy vs. power lectures impacted survey responses (in a list experiment)



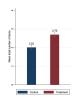
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- October by zoom (randomize at the individual-level)

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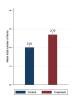
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# Background on Civil Service Academy

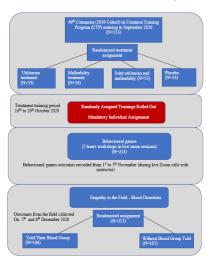
- Future advisors to the President, Prime Minister, cabinet ministers, governors and police chiefs.
- "key wheels on which the entire engine of the state runs" (Central Superior Services, 2019)
- Select 1.5% of test-takers
- Mandatory attendance and high-stakes

## Background on Civil Service Academy

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- "key wheels on which the entire engine of the state runs" (Central Superior Services, 2019)
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#### Utilitarian x Malleability x Both x Control

#### Before the first workshop



Four treatments via a non-shareable / non-downloadable link

# Soft Skills and Social Emotional Learning

#### Social skills reduce coordination costs, so teams work more efficiently

workers "trade tasks" to exploit their comparative advantage

#### SOCIO-EMOTIONAL SKILLS

#### Why should we care?

- Socio-emotional skills are strong predictors of academic achievement and can become key success factors in the labor market and for numerous life outcomes.
- Yet, some SEL are still strongly predicted by social background / gender.
- This can change as socio-emotional skills are malleable.

How can education systems foster SEL?

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# Soft Skills and Social Emotional Learning

Lancius P. Paris Harrison and

# **Measuring Socio-Emotional Skills**

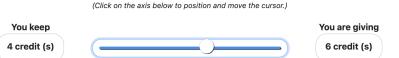
We built a platform that contains incentivized games and survey questions to measure socio-emotional skills.

| Incentivize  | Survey-based measures  |  |
|--|--|--|
| Social preferences Altruism Trust Cooperation Moral Redistribution Honesty (Lie) | Other preferences Impatience Risk Aversion Competitiveness Perseverance Beauty contest Ambiguity aversion Self-control | Self-confidence<br>Creativity<br>Empathy<br>Curiosity<br>Stereotypes (IAT)<br>Ethical decision (moral trolley) |

#### Altruism

In this game, we allocate you 10 credits. Your task is to choose how many credits you want to keep for yourself and how many you want to give to another participant.

Please choose an option from the following distributions:



#### Charity

In this game, we offer you to make 5 choices. Only one of these choices will be used to determine the credits received if you are drawn.

For each of the choices, you must choose between receiving the credits or donating the credits to UNICEF. If you are drawn, we will transfer your donation to UNICEF and purchase measles vaccines.

Measles is an extremely infectious disease that spreads very quickly in densely populated spaces. In vulnerable children, the disease is often fatal (more than 100,000 deaths per year worldwide), and can cause long-term physical or mental damage. UNICEF conducts major immunization campaigns, especially after natural disasters and other emergencies, to prevent the spread of the disease.

For each row, please choose one of the two options:

| )  | O I receive 2 credits; no donation to UNICEF  | O donation of 10 credits to UNICEF; no credits for me          |
|----|---|--|
| 2) | O I receive 4 credits; no donation to UNICEF  | O donation of 10 credits to UNICEF; no credits for me          |
| 3) | O I receive 6 credits; no donation to UNICEF  | O donation of 10 credits to UNICEF; no credits for me          |
| l) | O I receive 8 credits; no donation to UNICEF  | $\bigcirc$ donation of 10 credits to UNICEF; no credits for me |
| 5) | O I receive 10 credits; no donation to UNICEF | O donation of 10 credits to UNICEF; no credits for me          |

#### Cooperation

#### Decision on your part

You must decide how much of this initial endowment you wish to transfer to the other participant (between 0 and 1 credit). The transferred quantity will be <u>doubled</u> and the other participant will receive this doubled quantity. What you choose not to transfer remains in your possession but will not however be doubled.

#### Exemple de votre décision



#### Decision (simultaneous) from your partner

The other participant simultaneously makes the same decision. He decides how much of his initial endowment he wishes to transfer to you (between 0 and 1 credit). You will receive double this transferred amount.

#### Coordination

Each round, each of you has the choice between two options: A and B.

Your winnings are shown in the table below (your winnings are in blue, your partner's in black)

|      |          | L'autre participant  |                      |
|------|----------|----------------------|----------------------|
|      |          | Action A             | Action B             |
| Vous | Action A | 3 crédits, 3 crédits | 3 crédits, 0 crédits |
|      | Action B | 0 crédits, 3 crédits | 5 crédits, 5 crédits |

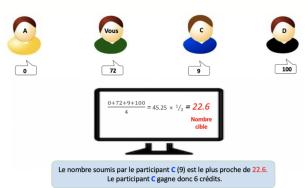
#### Theory of Mind

Each round, each party member submits a number between 0 and 100. Single digit decimal numbers are allowed.

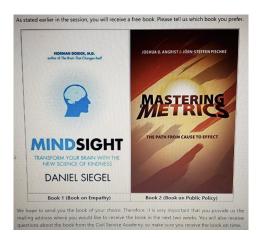
The computer then calculates the average of the 4 proposed numbers, then multiplies this average by a half.

This gives a "target number" as illustrated below.

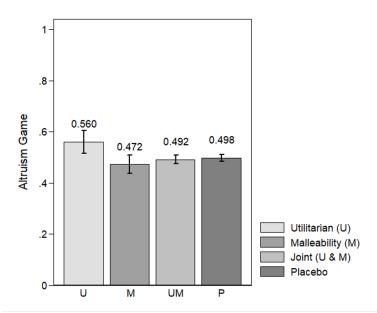
The member of the group whose proposed number is closest to the target number earns 6 credits.



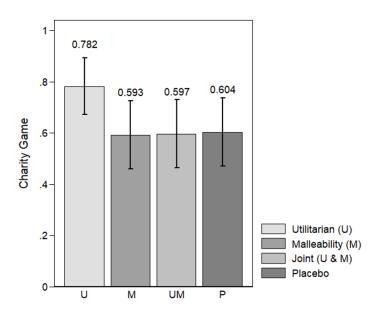
#### Book Choice (lottery)



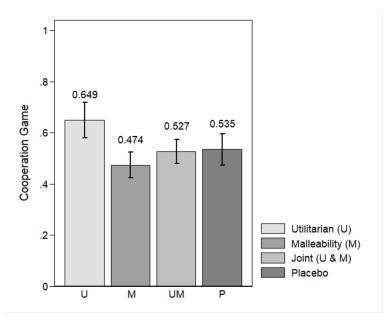
# Impact on Altruism



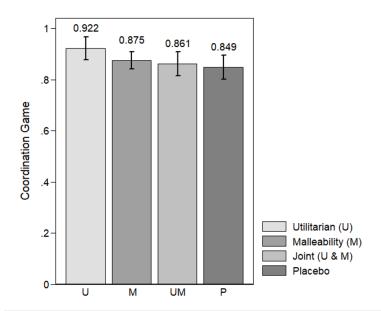
#### Impact on Charity



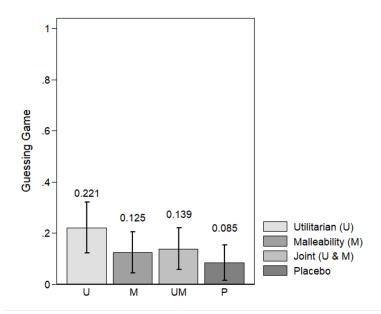
#### Impact on Cooperation



#### Impact on Coordination



#### Impact on Theory of Mind



**Individual Controls** 

Mean of dep. var. (placebo)

Observations

|                                       | Altruism Game |          | Charity Game |         |  |
|---------------------------------------|---------------|----------|--------------|---------|--|
|                                       | (1)           | (2)      | (3)          | (4)     |  |
| Stand-alone Utilitarian ( <i>U</i> )  | 0.064***      | 0.061*** | 0.178**      | 0.215** |  |
|                                       | (0.023)       | (0.021)  | (0.088)      | (0.091) |  |
| Stand-alone Malleability ( <i>M</i> ) | -0.020        | -0.021   | -0.011       | -0.013  |  |
|                                       | (0.020)       | (0.010)  | (0.096)      | (0.003) |  |

|                              | (0.023)           | (0.021)           | (0.000)           | (0.071)           |
|------------------------------|-------------------|-------------------|-------------------|-------------------|
| Stand-alone Malleability (M) | -0.020<br>(0.020) | -0.021<br>(0.019) | -0.011<br>(0.096) | -0.013<br>(0.093) |
| Joint Treatment (UM)         | -0.006            | -0.018            | -0.007            | -0.046            |

(0.012)

Yes

213

0.498

(0.096)

No

213

0.604

(0.093)

Yes

213

0.604

(0.010)

No

213

0.498

Table 4: Mechanism - Impact of Treatments on Decision Making - Normalized

|                              | Cooperation Game |          | Coordination Game |         | Guessing Game |         |
|------------------------------|------------------|----------|-------------------|---------|---------------|---------|
|                              | (1)              | (2)      | (3)               | (4)     | (5)           | (6)     |
| Stand-alone Utilitarian (U)  | 0.138***         | 0.136*** | 0.078**           | 0.065*  | 0.136**       | 0.116** |
|                              | (0.046)          | (0.0489) | (0.033)           | (0.035) | (0.062)       | (0.058) |
| Stand-alone Malleability (M) | -0.042           | -0.040   | 0.0213            | 0.018   | 0.040         | 0.037   |
|                              | (0.040)          | (0.040)  | (0.029)           | (0.031) | (0.054)       | (0.055) |
| Joint Treatment (UM)         | -0.003           | -0.009   | 0.012             | 0.010   | 0.054         | 0.038   |
|                              | (0.037)          | (0.040)  | (0.034)           | (0.033) | (0.054)       | (0.060) |
| Individual Controls          | No               | Yes      | No                | Yes     | No            | Yes     |
| Observations                 | 213              | 213      | 213               | 213     | 213           | 213     |
| Mean of dep. var. (placebo)  | 0.535            | 0.535    | 0.849             | 0.849   | 0.085         | 0.085   |

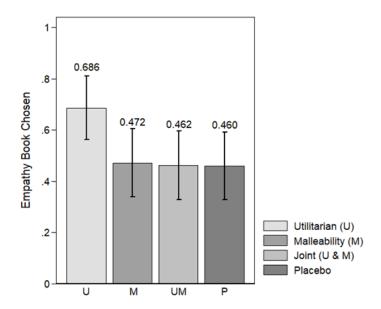
NOVEL EVIDENCE THAT THEORY OF MIND CAN BE IMPROVED WITH EMPATHY

Table 4: Mechanism - Impact of Treatments on Decision Making - Normalized

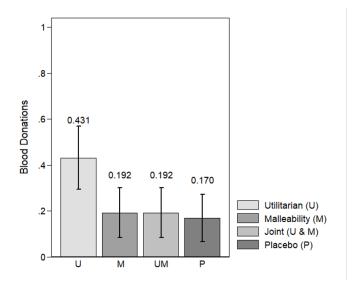
|                              | Cooperation Game |          | Coordination Game |         | Guessing Game |         |
|------------------------------|------------------|----------|-------------------|---------|---------------|---------|
|                              | (1)              | (2)      | (3)               | (4)     | (5)           | (6)     |
| Stand-alone Utilitarian (U)  | 0.138***         | 0.136*** | 0.078**           | 0.065*  | 0.136**       | 0.116** |
|                              | (0.046)          | (0.0489) | (0.033)           | (0.035) | (0.062)       | (0.058) |
| Stand-alone Malleability (M) | -0.042           | -0.040   | 0.0213            | 0.018   | 0.040         | 0.037   |
|                              | (0.040)          | (0.040)  | (0.029)           | (0.031) | (0.054)       | (0.055) |
| Joint Treatment (UM)         | -0.003           | -0.009   | 0.012             | 0.010   | 0.054         | 0.038   |
|                              | (0.037)          | (0.040)  | (0.034)           | (0.033) | (0.054)       | (0.060) |
| Individual Controls          | No               | Yes      | No                | Yes     | No            | Yes     |
| Observations                 | 213              | 213      | 213               | 213     | 213           | 213     |
| Mean of dep. var. (placebo)  | 0.535            | 0.535    | 0.849             | 0.849   | 0.085         | 0.085   |

NOVEL EVIDENCE THAT THEORY OF MIND CAN BE IMPROVED WITH EMPATHY

#### Impact on Empathy Book Choice

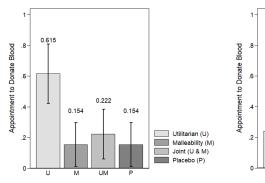


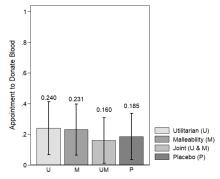
#### Impact on Blood Donation



Empathy utilitarian treatment increased likelihood to donate by 20 percent

## Impact on Effective Altruism





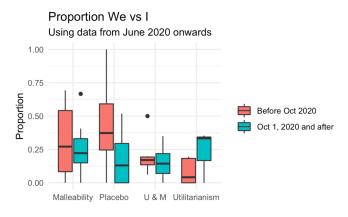
Only for matching blood type

**Table 3: Impact of Treatments on Blood Donations** 

|   | Blood Donations     |         |           |              |  |  |
|---|---------------------|---------|-----------|--------------|--|--|
|   | Agreement to Donate |         | Appointme | nt to Donate |  |  |
|   | (1)                 | (2)     | (3)       | (4)          |  |  |
| Stand-alone Utilitarian (U)                       | 0.263***            | 0.062   | 0.284***  | 0.104        |  |  |
|   | (0.095)             | (0.137) | (0.087)   | (0.125)      |  |  |
| Stand-alone Malleability (M)                      | 0.081               | 0.063   | 0.041     | 0.062        |  |  |
|   | (0.086)             | (0.129) | (0.077)   | (0.127)      |  |  |
| Joint Treatment (UM)                              | 0.090               | 0.145   | 0.042     | -0.026       |  |  |
|   | (0.087)             | (0.127) | (0.075)   | (0.105)      |  |  |
| Blood Group Told (T)                              |                     | -0.069  |           | -0.059       |  |  |
|   |                     | (0.147) |           | (0.143)      |  |  |
| Blood Group Told X Stand-alone Utilitarian (UXT)  |                     | 0.397** |           | 0.355**      |  |  |
|   |                     | (0.192) |           | (0.173)      |  |  |
| Blood Group Told X Stand-alone Malleability (MXT) |                     | 0.040   |           | -0.041       |  |  |
|   |                     | (0.183) |           | (0.169)      |  |  |
| Blood Group Told X Joint Treatment (UM X T)       |                     | -0.093  |           | 0.137        |  |  |
|   |                     | (0.175) |           | (0.153)      |  |  |
| Individual Controls                               | Yes                 | Yes     | Yes       | Yes          |  |  |
| Observations                                      | 205                 | 205     | 205       | 205          |  |  |
| Mean of dep. var. (placebo)                       | 0.192               | 0.192   | 0.154     | 0.154        |  |  |

#### Impact on Thought Leadership

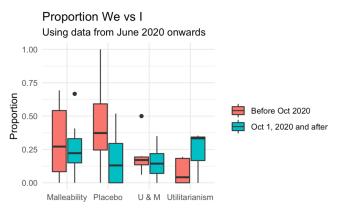
#### Preliminary evidence in twitter feeds



increase % of "We" vs. "l"

#### Impact on Thought Leadership

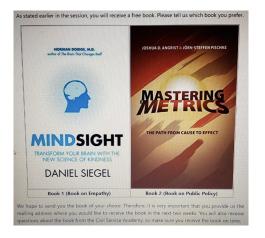
#### Preliminary evidence in twitter feeds



increase % of "We" vs. "I"

#### Book Choice (lottery)

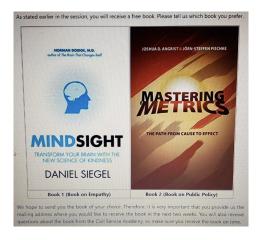
Impact of learning causal inference on bureaucratic performance?



Graded 1500 word essay & 1500 word application to prospective career

#### Book Choice (lottery)

Impact of learning causal inference on bureaucratic performance?



Graded 1500 word essay & 1500 word application to prospective career

- Rule of Law ⇒ Contract Enforcement ⇒ Economic Growth
  - ► Random Case Assignment or RCTs
  - ► Training to Improve Justice
- Governance ⇒ Trust ⇒ Economic Growth
  - Shinyapps and Adaptive RCTs
  - ► CAN WE USE MACHINE LEARNING TO INCREASE TRUST IN THE LAW?

- ullet Rule of Law  $\Longrightarrow$  Contract Enforcement  $\Longrightarrow$  Economic Growth
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  - ► Can we use machine learning to increase trust in the law?

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  - Random Case Assignment or RCTs
  - Training to Improve Justice
- Governance ⇒ Trust ⇒ Economic Growth
  - Shinyapps and Adaptive RCTs
  - ▶ Can we use machine learning to increase trust in the law?

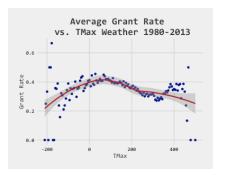
- Rule of Law ⇒ Contract Enforcement ⇒ Economic Growth
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  - ► Can we use machine learning to increase trust in the law?

# Judicial Analytics for Recognition and Dignity

 Cognitive science and psychology suggests that humans have limited and imperfect reasoning capacities (Tversky and Kahneman 1986; Eyster 2019)

#### The weather

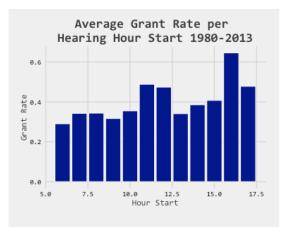
Judges deny refugees asylum when the weather is too hot or too cold



ICAIL 2017

#### Time of Day

They grant asylum more before lunch and less after.

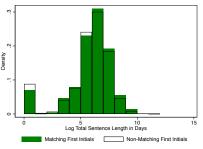


1M decisions

See also Norris 2020, Danziger, Levav, Avnaim-Pesso, PNAS 2011

#### The defendant's name

They assign longer sentence lengths to defendants whose first initial matches their own.



Log Total Sentence Length in Days Matching First Initials Non-Matching First Initials First Letter of First Name First Letter of Last Name

See also Belenzon, Chatterji, and Daley, AER 2017, Jena, Sunstein, and Hicks 2018

#### The defendant's birthday

When they do the opposite and give the gift of leniency

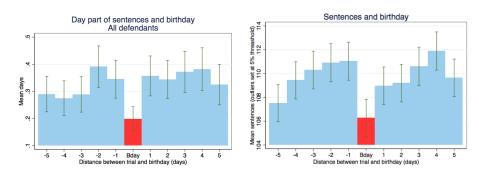
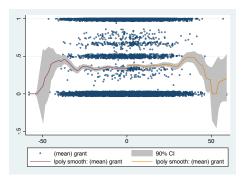


Figure: US and French judicial leniency on defendant birthdays

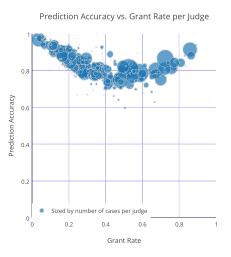
#### NFL Football

Judges are more lenient the day after their team wins, rather than loses.



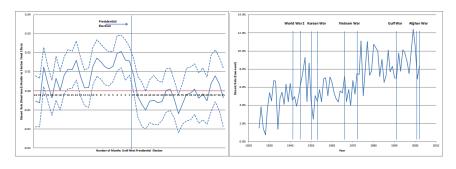
## Snap judgments

We can use machine learning to predict asylum decisions with 80% accuracy the date the case opens.. and when it closes.



ICAIL 2017

#### Elections and wartime also affect decisions



JLE 2017

#### Gambler's Fallacy

How people often imagine a sequence of coin flips:

0101001011001010100110100

A real sequence of coin flips:

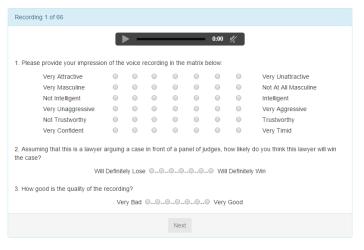
01010111111011000001001101

# Up to 5% of decisions reversed due to the gambler's fallacy



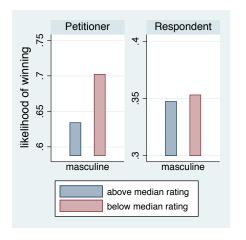
**QJE 2016** 

# In the US Supreme Court, the first sentence of the lawyers oral arguments are identical



"Mr. Chief Justice, (and) may it please the Court?"

# Male petitioners below median in masculinity rating are 7 percentage points more likely to win



Plos-ONF 2016

### Besides voice, there is text



- Females: Migraine, hysterical, morbid, obese, terrified, unemancipated, battered
- Males: Reserve, industrial, honorable, commanding, conscientious, duty

### Besides voice, there is text



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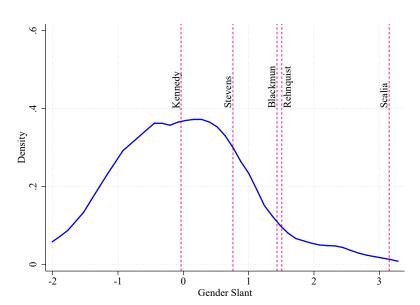
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- Females: Migraine, hysterical, morbid, obese, terrified, unemancipated, battered
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# We can do this judge by judge

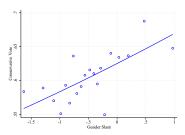
Justice Scalia is an outlier in gender slant



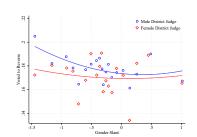
## In the Circuit Courts, judges with more gender slant...

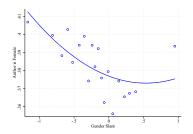
Vote against women's rights issues

Assign fewer opinions for females to author

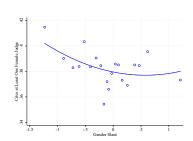


Reverse male judges less often

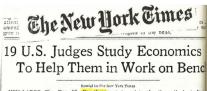




Cite female judges less often



# By 1990, 40% of federal judges had attended an economics-training program.



KEY LARGO, Fla., Dec. 18-For three not to relate the theoretical studies weeks, 19 Federal judges from cases now pending in Federal cou around the country took a grueling, six- "One has to be very cautious in deal" day-a-week course in economics that with Federal judges," said Henry Man ended here vesterday.

sometimes ending at 10 P.M. or later, in economic theory and enable them the judges received the equivalent of a better understand the testimony of exp full semester at the college level.

Their teachers were, among others, two | Chief Judge David N. Edelstein of Nobel laureates in economics, Paul Sam- Federal District Court in the South uelson and Milton Friedman. The courses, District of New York, who is the sponsored by the Law and Economics Center of the University of Miami School of Law, made up what is believed to Corporation antitrust case-regarded have been the first such institute for many lawyers as the most important a Federal judges.

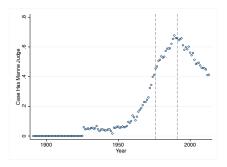
said Chief Judge John W. Reynolds of attend the institute to clear any f the Federal District Court in the Eastern questions about a possible conflict of District of Wisconsin, "We were here not terest. to become economists, but to understand the language of economics. Courts are replied that they saw no grounds for only as good as judges and the lawyers conflict of interest in my coming he who appear before us. By and large, our Judge Edelstein said. training in economics is not really satis- From the beginning, the judges, factory, and yet we are being increasingly of them 60 years old or over, beh called upon to decide economic issues." like students, deferring to their tead

director of the center. "Our goal has be With classes starting at 9 A.M. and to give them the most recent think

witnesses and lawvers." in the International Business Machi trust litigation of the century-inform "It was a very enriching experience," attorneys in the case of his intention

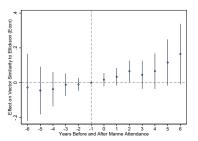
"All the lawyers were very cordial

The program dealt basically with eco- and reminiscing about undergrade nomic theory, and an effort was made days decades ago.



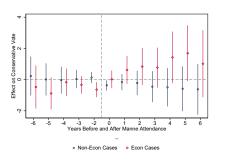
### The results of these seminars were dramatic

We can see economics language used in academic articles became prevalent in opinions.

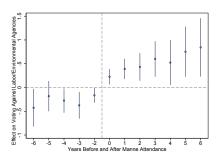


### The results of these seminars were dramatic

We can see economics trained judges changing how they decided



Econ vs Non-Economics Cases

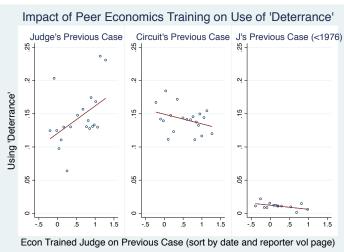


on Labor/Environmental Cases

See also Hjort, Moreira, Rao, and Santini, AER R&R

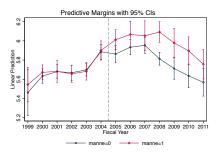
### Impacting their peers

We can see economic language traveling from one judge to another and across legal areas.



# When judges were given discretion in sentencing

economics trained judges immediately rendered 20% longer sentences relative to the non-economics counterparts.



### Judicial Analytics and Law J of Artificial Intelligence & Law 2018

Justice: equal treatment before the law  $(y = f(X) + \varepsilon, a \rightarrow X)$  equality based on recognition of difference  $(y \perp W, var(\varepsilon) \perp W, a \nrightarrow W)$ 

control principle and merit principle: individuals responsible only for events that are under their control W: race, gender, masculinity, name, football, weather, judge's lunchtime, preceding case, ...

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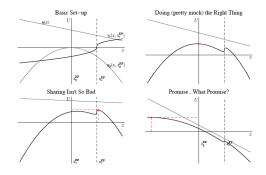
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### Machine Learning and Rule of Law Computational Analysis of Law 2018

- Behavioral anomalies offer intuitive understanding of feature relevance
- "settings where people are closer to indifference among options are more likely to lead to detectable effects [of behavioral biases] outside of it." (Simonsohn, JPSP 2011)



A model of recognition-respect and revealed preference indifference

- Early predictability
- Behavioral anomalies
- Inattentiveness to appellate reversals
- Implicit risk rankings of litigants (asylees) closer to random
- Is indifference greater for some refugees (e.g., from Global South)?

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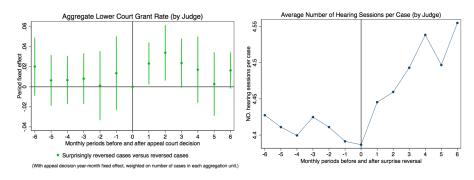
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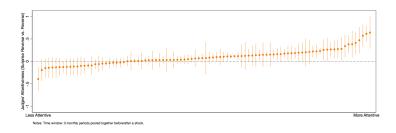
# After "Surprise" Reversals, Judges Grant More Asylum and Hold More Hearing Sessions



Surprise Reversal is a reversal of a decision that was predicted to be "Affirm"

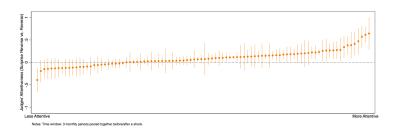
See also Posner, HUP 2010

# Judges Vary in Responsiveness to Reversal



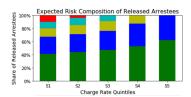
Do less attentive judges have implicit risk rankings closer to random?

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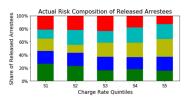


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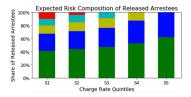


 If defendants released based only on risk score, the harshest prosecutors would only be releasing low-risk defendants.

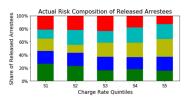


- Distribution of risk scores for released defendants is similar for most lenient and least lenient prosecutors.
- Are the lenient asylum judges, only denying the 'riskiest' applicants
  - ▶ i.e., seeing the lowest reversal rates (of their asylum denials)?



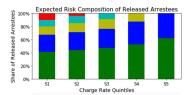


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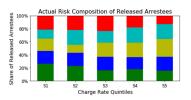


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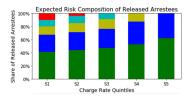


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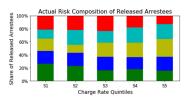


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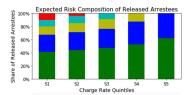


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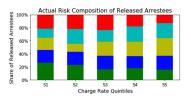


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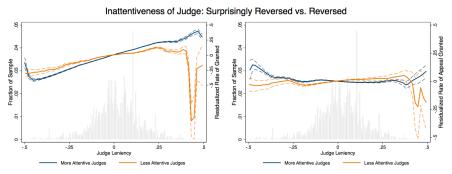
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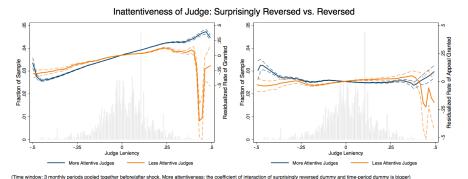
## Left Figure: Judges have strong habits

A judge who is generally lenient in other cases is likely to be lenient in a given case



(Time window: 3 monthly periods pooled together before/after shock. More attentiveness: the coefficient of interaction of surprisingly reversed dummy and time-period dummy is bigger)

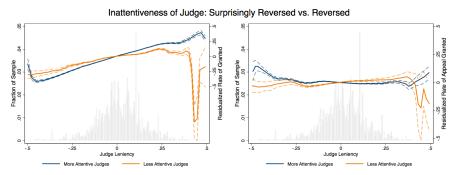
# Right Figure: Assess implicit risk ranking



If judges are 'ordering' their asylees, the most lenient judge letting in the most applicants should be rejecting only the "least safe" applicants

Their appeal success should be lower, which we see among more attentive judges

### .. but not less attentive judges

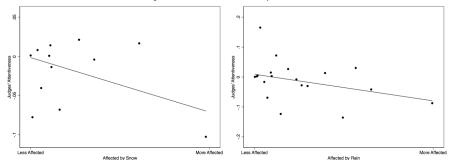


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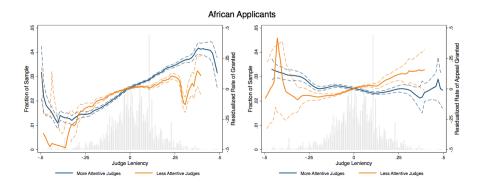
.. who may be more prone to other extraneous factors

### .. such as weather

#### Judges' Attentiveness and Vulnerability to Weather



# Difference in Indifference for asylees from the Global South



## Judicial Analytics for Recognition and Dignity

- Cognitive science and psychology suggests that humans have limited and imperfect reasoning capacities (Tversky and Kahneman 1986; Eyster 2019)
- Gambler's fallacy, mood, time of day, order, ...
  - highlight fragility of courts
    - tin a crowded immigration court, 7 minutes to decide a family's future" (Wash Post 2/2/14)
- Policy discussion tends to revolve around having AI replace humans or suggest the optimal decision
- Consider instead an incremental approach that shows decision-makers their predicted self and then uses predictions of error to nudge

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## Stage 1: Predicted Self

- In Stage 1, people use AI as a support tool, speeding up existing processes (for example, by prefilling forms)
  - ► An Al-based recommender system offers a decision-maker the best prediction of themselves, based on their previous decision-making, from a model using only legally relevant features X.
    - ★ assess judges vs. their predicted self
  - ▶ (1) Increase consistency across similar cases by offering the relevant reference points and cabining the influence of extraneous factors.
  - ▶ (2) Seeing the predicted self leverages self-image motives of pro-social decision-makers (Benabou and Tirole QJE 2011).
  - ▶ (3) Deviating from defaults facilitates conscious deliberation.
- self-image (predicted self)

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#### Stage 2: Prediction of Error

- A deviation that is more likely to render an error (from a model using all available features X and W) can be accompanied by a nudge to "be more attentive" or spend more time to make a better decision.
  - ▶ (1) A nudge, instead of a checklist, might impose less bandwidth.
  - ▶ (2) Save time and energy to focus on novel, complex cases.
- self-improvement (nudges)

## Stage 3: Explanations

- A decision-maker may want interpretable machine learning and request a reason for why the deviation may lead to mistakes.
  - ▶ (1) Stage 3 elevates the AI to the role of a more general coach, providing feedback on choices.
  - ▶ (2) The more people feel that their autonomy is protected and that they are in control of the conversation—able to choose when feedback is given—the better they respond to it. (West and Thorson 2018)
- self-understanding (why)

## Stage 4: Dialogue

- Of course, it is always possible that the AI system's suggestion would not take into account some reliable private information that the decision-maker might have access to.
  - Where this happens, the AI system would be steering the decision-maker off course rather than correcting for their inconsistencies.
  - Therefore, a dialogue, encouraged between the decision-maker and the Al system, allowing for the Al to learn from the user as well.
- self-expression (autonomy)

## Stage 5: Community of Experts

- Al brings in other people's decision histories and patterns, serving as a platform for a community of experts.
  - ▶ A decision-maker may want to access a community of experts by seeing what the algorithm predicts other to do.
  - This can be accessible as a dropdown menu, to seek advice from a particular decision-maker,
    - or as a statistical distribution to protect privacy.
- community of practice (self vs. others)

- Stage 6, experts advised it helps train novices
  - who tend to make more mistakes
  - experts can input a preferred decision
  - or use prediction if appealed
- Stage 7, WebMD for litigants, increasing access to justice
  - and transparency & accountability
- Stage 8, knowledge of one's impact
- Stage 9, use feedback from dialogue stage as recommender system
  - with A|B testing to generate personalized causal inference

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- Reduces Bias
  - Assess judges vs. their predicted self
- Increase Autonomy
  - ► Support tool / default
- Enhance Learning
  - ▶ Pointing out when predicted to error + community of practice
- Explainable Transparency
  - ► Interpretable ML
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# Proof of Concept



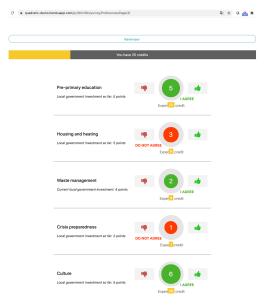
- Assess effects on trust and perceived indifference of lawmakers
- and applications, decisions, reversals, speed, disparities, etc.

Trust in the Law

CAN WE MOVE BEYOND LIKERT SCALES OF USER SATISFACTION?

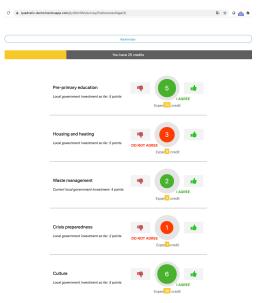
# Quadratic Voting for Surveys

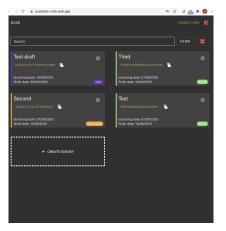
Estonian public-facing dashboard for local government accountability



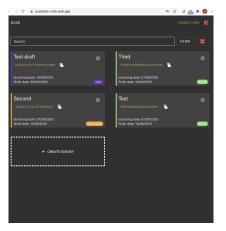
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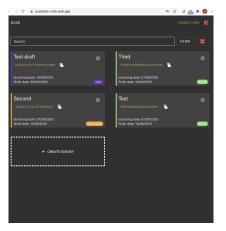




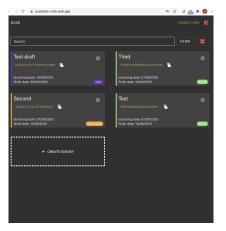
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- Multi-country: How do individuals trade-off indicators of court quality



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# Open-source platform for lab, web, and field experiments



- Estonia, Peru, Pakistan, France
  - allowing interactive experiments, socially-distanced
- Cadaster
  - data management platform from data-entry to decision-making

## Open-source platform for lab, web, and field experiments



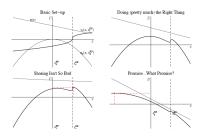
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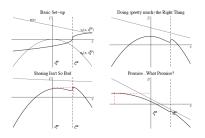
- state expects citizens, generally, to obey the law
  - rules that limit individuals to take actions that might otherwise be justified.
  - ▶ so state owes a way to address a wrong through the formal legal system.
- implies a right to recourse, a recognition of wrongs (Goldberg and Zipursky, HUP 2020)
- access to justice, efficiency of justice, knowledge/precedent/equity



A lack of recognition

revealed preference indifference

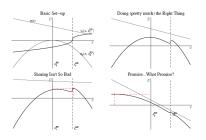
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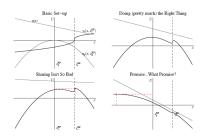
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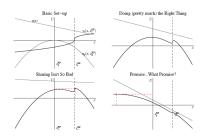
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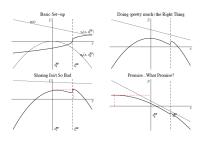
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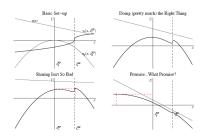
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A lack of recognition revealed preference indifference fragility, conflict, and violence

"Ferguson and the Violence of Indifference" (Critical Education, Cuenca 2017)

# The New York Times

# Before an Arrest, Officers Tossed a (Virtual) Coin

July 14, 2018

Justice and Security