# The Political Legacy of Slavery: Replicating and Testing the Path Dependence Theory on a Criminal Justice Outcome

Rebecca A. Larsen

School of Economic, Political and Policy Sciences

University of Texas at Dallas

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Dr. Vito D'Orazio

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## Abstract

This replication and extension paper duplicates some of the key findings from Acharya, Blackwell, and Sen's 2016 work. They found support for a lasting impact of slavery on modern white beliefs and voting behaviors. As county-level proportion of slavery in 1860 increased, they observed modern decreases in democratic voting and support for affirmative action, and increases in racial resentment measures. This paper confirms their findings through replication, and expands on their work to test their behavioral path dependence theory on modern criminal justice outcomes. Utilizing the same independent variable (proportion of slavery in 1860), and three regression models which include state fixed effects and 1860 covariates, initial findings suggest that this path dependence does not explain differences in overall criminal justice incarceration proportions and disparities among racial groups. Counties with higher rates of slavery had lower levels of incarceration and a lower black proportion incarcerated. Data reliability checks, tests on additional criminal justice outcomes, and consideration of other independent variables that may have more explanatory power, are suggested as next steps in this line of research.

**The Political Legacy of Slavery: Replicating and Testing the Path Dependence Theory on a Criminal Justice Outcome**

This replication and extension paper explores the 2016 Acharya, Blackwell, and Sen article, "The Political Legacy of Slavery." In it the paper steps away from state-level and Southern focused assessments of slavery's impact, and instead hypothesizes that the rate of slavery at a county level has a lasting political impact. Among white residents who live in counties that had higher rates of slavery in 1860, they observe higher levels of racial resentment, lower levels of democratic voting, lower approval for affirmative action initiatives, and lower levels of positive feelings toward Black residents. They compare southern counties where slavery was prevalent to other southern counties with lower rates of slavery to suggest that it is not necessarily a southern effect, but instead a lasting path dependence that stems from high rates of slavery. They also employ an instrumental variable approach using cotton suitability.

This paper replicates the main findings from Acharya et al.'s research (2016a, 2016b), and then expands on their work to test an extension of their path dependence theory to a criminal justice outcome. County level data is utilized to observe incarceration proportion and proportion of incarceration by race. Black proportion of incarceration is higher nationally, and in the South, compared to other racial groups. However, findings from this first-step study do not connect to proportion of slavery as a driver. Instead, across all models of specification, counties with higher rates of slavery in 1860 have lower proportions of black residents incarcerated today. Overall proportion of incarceration also decreases but at lower levels of significance. Meanwhile, white and Latino resident incarceration increases when slavery rates in 1860 are higher. This initial consideration of criminal justice outcomes suggest a lack of support for path dependence theory influencing modern system-wide outcomes.

## Literature Review

### Path Dependence Theory

A body of literature observes historical institutions can affect institutional and behavioral outcomes decades and even centuries after the institutions no longer exist (Acemoglu et al., 2012; Mitchener & McLean, 2003; Nunn, 2009; Nunn & Wantchekon, 2011; O'Connell, 2012; Pearson, 2000).[1] Acharya et al use this theory as the foundation for their empirical work, connecting slavery propensity with more present-day political attitudes. They suggest that this behavioral path dependence is realized through intergenerational socialization and institutional reinforcement, and also recognize that both reinforcing and mitigating factors play a role. They explore these factors in more detail in later work (Acharya et. al., 2018). For example, the civil rights movement and subsequent laws of that period served as a mitigating factor.

### Literature on Slavery and Criminal Justice Outcomes

There is also consistent work proposing the criminal justice system is an offshoot of slavery – from slavery to mass incarceration (Alexander, 2010; Muller, 2021; Hinton & Cook, 2021). This mostly appears to support the racial threat theory and is focused on the United States as a whole or at times on a specific region, usually the South, or even a single state (Perkinson, 2010), but rarely counties. There are also consistent empirical findings of disproportionality concerning how Black Americans are treated in the criminal justice system. Black Americans are more likely to receive the death penalty (Beckett & Evans, 2016), more likely to be arrested for marijuana possession (Nelson & Knaack, 2018), more likely to be detained and incarcerated (Kutadeladze, et. al., 2014), and receive longer sentences than their white counterparts in both

[1] As presented and reviewed by Acharya et. al. (2016)

state and federal systems (Doerner & Demuth, 2009; Bushway & Piehl, 2001; Mitchell, 2005; U.S. Sentencing Commission, 2012, 2017, 2020).

Few works have considered these outcomes at a county-level within the context of the history of slavery. Two works with this focus found that counties within southern states that had higher levels of slavery, have higher contemporary violent crime rates (Gouda & Rigterink, 2016) and higher rates of anti-Black hates crimes (Gunadi, 2019). One study specifically built from Acharya et. al.'s framework and found high levels of slavery in 1860 increase the likelihood of pretrial detention, the probability of being incarcerated, and increase the length of sentences (Gottlieb & Flynn, 2021). These results were true for both white and black residents. I will observe incarceration proportion generally and among different incarcerated racial groups to better understand if counties at large are more punitive or if there are differences by race.

## Research Design

Acharya et al incorporated several approaches to overcome the challenge of testing causality for historical events from hundreds of years ago. They utilize a quasi-experimental approach which relies on regression analysis. They create a base regression model, which is weighted least squares and weights for sample size. Next, they incorporate a state fixed effects approach to address issues of heterogeneity and omitted variable bias. This helps to address the potential differences in state policy adoption that could have influenced slavery shares in 1860 and the outcome variables in ways unrelated to slavery and unobserved in their model. In their third model, they include both state fixed effects, along with a host of 1860 covariates which seek to isolate the propensity of slavery from other factors that could have been predictive of slavery, such as economic inequality and viability of farmland. For thermometer scores (see Table 1 for variable description), they shift their unit of analysis to the individual level and

incorporate survey-year fixed effects. They then employ an instrumental variable approach using cotton suitability in a two-stage least squares model. They do this to address the potential of measurement error in 1860 slavery data, and the threat of omitted variable bias in their 1860 covariates. See Table 1 for a description of their relevant variables.

**Table 1. Data Description of Acharya et al.'s Study**

| | |
|---|---|
| **Unit of Analysis:** | ***U.S. Counties***<br>(Except for Therm Score which is individual) |
| **Independent Variable:** | ***Proportion Slavery in 1860***<br>Measured: Rate of slavery in the U.S. County in 1860.<br>Use an area-weighting method to map data from 1860 Census onto county boundaries in 2000, enabling the researchers to estimate the proportion enslaved in 1860 within modern-day counties.<br>- Name of variable in dataset: p1860 |
| **Dependent Variables:** | ***Proportion Democrat***<br>Measured: Share of white residents who identify as Democrats, for the specified time period.<br>- Name of variable in dataset: pdem[year]. |
| | ***Affirmative Action***<br>Measured: Share of white residents who currently support affirmative action.<br>- Name of variable in dataset: affirm. |
| | ***Racial Resentment***<br>Measured: One a five-point scale, this is the average level of agreement (for the first question) and disagreement (for the second question) to two CCES questions that get at racial resentment. The questions are: "The Irish, Italian, Jews and many other minorities overcame prejuddice and worked their way up. Blacks should do the same." And: "Generations of slavery and discrimination have created conditions that make it difficult for Blacks to work their way out of the lower class."<br>- Name of variable in dataset: resent. |
| | ***White-Black Therm Score***<br>Measured: The ANES asks questions about respondent's feelings toward different groups of people on a scale of 0 to 100. To get at a measure of racial hostility, they take the difference between the white respondents' feeling ratings toward whites and their feeling ratings toward blacks.<br>- Name of variable in dataset: therm.diff.<br>- NOTE: Individual unit of analysis. |
| **Controls:** | ***1860 Covariates***<br>*Log of total county population*<br>- Name of variable in dataset: totpop1860<br>*Proportion of farms in the county smaller than 50 acres*<br>- Name of variable in dataset: sfarmprop1860<br>*Inequality of farmland holdings*<br>- Name of variable in dataset: land.ineq1860<br>*Log of total farm value per improved acre of farmland in the county*<br>- Name of variable in dataset: fvalpac1860<br>*Log of the acres of improved farmland*<br>- Name of the variable in dataset: acimp1860 |

| | |
|---|---|
| | *Proportion of total population in 1860 that is free black*<br>- Name of the variable in dataset: fbprop<br>*Access to rails and navigable rivers/canals*<br>- Name of the variable in dataset: rail; water<br>*Log of county acreage*<br>- Name of the variable in dataset: rugged<br>*Ruggedness of the county terrain*<br>- Name of the variable in dataset: rugged<br>*Latitude and longitude of the county*<br>- Name of the variable in dataset: latitude; longitude |
| **Instrumental Variable:** | ***Cotton Suitability***<br>Measure that represents the maximum potential cotton yield.<br>Measured by: estimates from climate averages from 1961 to 1990, which are then used to average the intermediate and high levels of inputs needed to extract cotton.<br>- Name of variable in dataset: cottonsuit |

Their analysis does not study the effect of slavery with a full population of counties, but instead they narrow down to examine white attitudes and behaviors within Southern counties. They want to know if the differences observed in Southern politics may be attributed to historical impact at an individual and county level rather than an overall regional effect.

**Extension Methodology**

For the extension, I utilize the same county-level design approach, and three regression models, to isolate the effect of slavery in 1860. The individual data approaches are not relevant to this extension and therefore are not incorporated. The research question is: Does behavioral path dependence extend to criminal justice outcomes in formerly high slavery counties? I expect to observe that counties that had higher rates of slavery will have greater present-day disproportional criminal justice outcomes for Black residents.

- Hypothesis 1: Counties that had higher rates of slavery will have higher incarceration rates.
- Hypothesis 2: Counties that had higher rates of slavery will have higher rates of black disproportionality in incarceration.

The dependent variables for this extension come from 2010 U.S. Census data as compiled and reported by the Prison Policy Initiative (Wagner & Kopf, 2015). They are incarcerated

proportion within a county, as well as proportion of incarceration by racial group. See Table 2 for detailed variable descriptions and measurements. Proportion incarcerated is examined for white, black, and Latino residents to compare outcomes by county across racial groups, and total incarceration proportion is observed to understand if counties are more punitive in general.

| **Table 2. Data Description of Extension Portion of Study** | |
|---|---|
| **Unit of Analysis:** | ***U.S. Counties*** |
| **Independent Variable:** | ***Proportion Slavery in 1860***<br>Measured: Rate of slavery in the U.S. County in 1860.<br>See Table 1 for detailed description.<br>Name of variable in dataset: p1860 |
| **Dependent Variables:** | ***Incarcerated Proportion***<br>Measured: Ratio of incarcerated residents over total number of residents.<br>Name of variable in dataset: incarr |
| | ***White Proportion Incarcerated***<br>Measured: The total number of white residents incarcerated over the total number of white residents in a county.<br>Name of variable in dataset: whiteprop |
| | ***Latino Proportion Incarcerated***<br>Measured: The total number of Latino residents incarcerated over the total number of Latino residents in a county.<br>Name of variable in dataset: latinoprop |
| | ***Black Proportion Incarcerated***<br>Measured: The total number of black residents incarcerated over the total number of black residents in a county.<br>Name of variable in dataset: blackprop |

Analyses were run on both the full population and on Southern counties. When all U.S. counties are included, the effects discussed below became smaller but maintained the same direction, significance, and overall findings. Therefore, I keep to Archarya's original design to explore what may be driving disparate outcomes in Southern counties specifically. Since my dependent variables are by definition weighted for county sample size, the base model is an OLS rather than WLS. Models were also run with county weights as well but did not effect the direction or significance, only the standard errors, and are not included here. The second and third models follow the author's approach and utilize state fixed effects and 1860 covariates.

## Replication Results and Discussion

In this section, I review the replication results which mirror the author's original findings. In Table 3 we observe the baseline estimates of proportion of slavery on the four outcome measures – proportion Democrat, support for affirmative action, racial resentment, and white-black thermometer difference. The first column is a weighted least-squares model, while columns 2 to 5 employ state-level fixed effects. Columns 2 to 4 utilize controls for the 1860 covariates (See Table 2 for these control descriptions). At all model specifications, we observe statistically significant effects of proportion of slavery in 1860 impacting the outcome variables as expected from the behavioral path dependence theory. As rate of slavery in a county increases, modern democratic voting proportion and support for affirmative action decreases, while racial resentment and white-black thermometer difference increases.

**Table 3. Effects of Slavery on White Political Attitudes**

| | Proportion Democrat | | Support for Affirmative Action | Racial Resentment | White-Black Thermometer Difference |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Prop. Slave, 1860 | -0.217*** | -0.127*** | -0.145*** | 0.463*** | 36.125*** |
| | (0.023) | (0.043) | (0.036) | (0.139) | (9.244) |
| Level | County | County | County | County | Individual |
| 1860 Covariates | | ✓ | ✓ | ✓ | |
| State Fixed Effects | | ✓ | ✓ | ✓ | ✓ |
| State-Year Fixed Effects | | | | | ✓ |
| Clustered SEs | | | | | |
| N | 1,242 | 1,152 | 1,152 | 1,027 | 1,489 |
| $R^2$ | 0.065 | 0.203 | 0.101 | 0.143 | 0.183 |

*p < .1; **p < .05; ***p < .01

Note: Listed in origin paper: Table 2. Effects of Slavery on White Political Attitudes

Table 4 presents Acharya et al's findings when incorporating an instrumental variable approach. They utilize cotton suitability to estimate the effects of proportion of slavery (1860) on their outcome measures. We observe a statistically significant relationship between cotton suitability and proportion of slavery. Columns 2 to 5 utilize two-stage least-squares models, and we see stronger effects than the original baseline estimates reported in Table 2.

**Table 4. Instrumental Variables Estimates of the Effect of Slavery**

| | Proportion Slave (1860) | Proportion Democrat | Support for Affirmative Action | Racial Resentment | White-Black Thermometer Difference |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Cotton Suitability | 0.441*** | | | | |
| | (0.037) | | | | |
| Prop. Slave, 1860 | | -0.277*** | -0.247*** | 0.823** | 51.748** |
| | | (0.104) | (0.088) | (0.352) | (19.305) |
| State Fixed Effects | | ✓ | ✓ | ✓ | ✓ |
| Geographic Controls | | ✓ | ✓ | ✓ | ✓ |
| Model | 2SLS First Stage | 2SLS Second Stage | 2SLS Second Stage | 2SLS Second Stage | 2SLS Second Stage |
| N | 1,120 | 1,120 | 1,120 | 998 | 51 |
| F Statistic | 80.077*** (df = 21; 1098) | | | | |

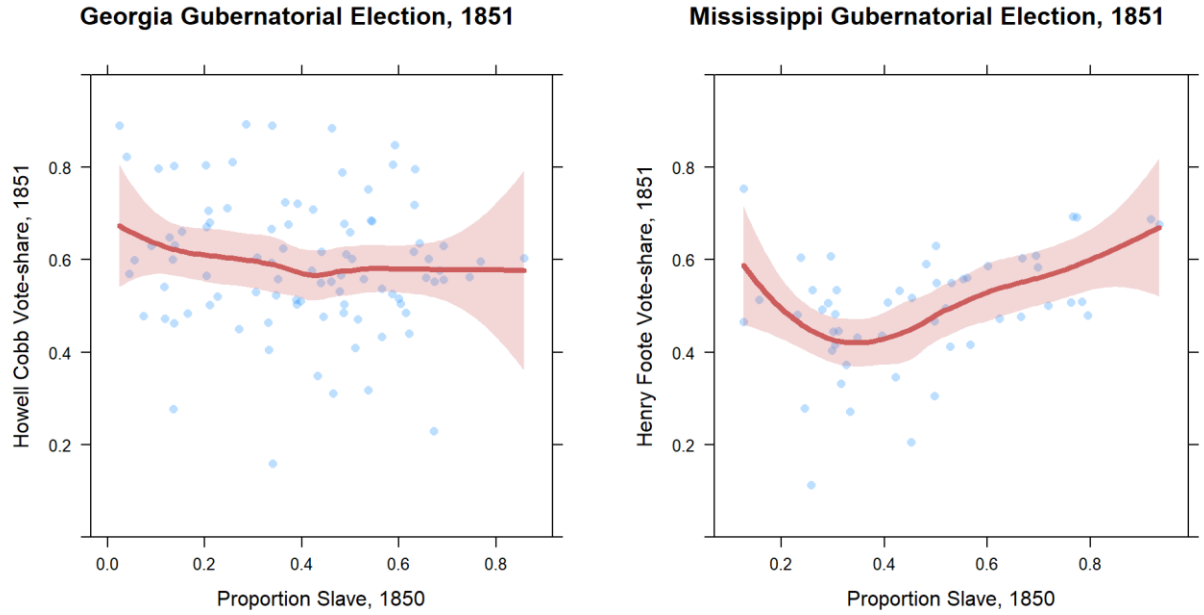
*p < .1; **p < .05; ***p < .01

Note: Listed in origin paper: Table 2. Instrumental Variables Estimates of the Effect of Slavery

The authors go on to conduct a variety of robustness checks and tests for alternative explanations to their findings as reported in Table 3 and 4. One such alternative explanation is that the antebellum era is the source for these outcomes rather than slavery itself and the ending of slavery. Figure 1 presents the percentage of votes for the candidate who was considered the moderate running in 1851 in Georgia and Mississippi, and the proportion of slavery in those states in 1850. The lack of a strong relationship in either election is interpreted to mean that the

"origins of the contemporary political geography of slavery" (Blackwell, et. al., 2018, p.635) did not originate in the antebellum period.

**Figure 1. Within-State Relationship Between Proportion of Slavery and Proportion Vote for Unionist Candidates.**




Note: Listed in origin paper: Figure 5.

A final alternative explanation is explored in this replication. Table 5 shows the effect of an interaction of respondent income with proportion of slavery in 1860. Though income was controlled for in previous robustness models, in terms of wealth during the time of slavery and how that impacts proportion of slavery, here they are seeking to understand if income today has a relationship with the outcome variables. We observe a statistically significant relationship across the outcome variables when observing income on its own, but once it is interacted with proportion of slavery, there are no effects. The authors interpret these findings to mean that income inequality is not the key driver behind the findings throughout their article.

**Table 5. Interaction of Slavery with Income on Individual White Attitudes**

| | Prop Democrat | Affirm. Action | Racial Resentment |
|---|---|---|---|
| | logistic | logistic | OLS |
| | (1) | (2) | (3) |
| Prop. Slave, 1860 | -0.483 | -2.103* | 0.317 |
| | (1.131) | (1.232) | (0.844) |
| Income | -0.188*** | -0.270*** | -0.048** |
| | (0.035) | (0.038) | (0.024) |
| Prop. Slave Income | 0.0003 | 0.145 | 0.002 |
| | (0.105) | (0.115) | (0.077) |
| State Fixed Effects | | | |
| 1860 Covariates | | | |
| Clustered SEs | | | |
| N | 29,944 | 29,888 | 12,213 |
| $R^2$ | | | 0.030 |
| AIC | 37,739.610 | 32,067.970 | |

*p < .1; **p < .05; ***p < .01

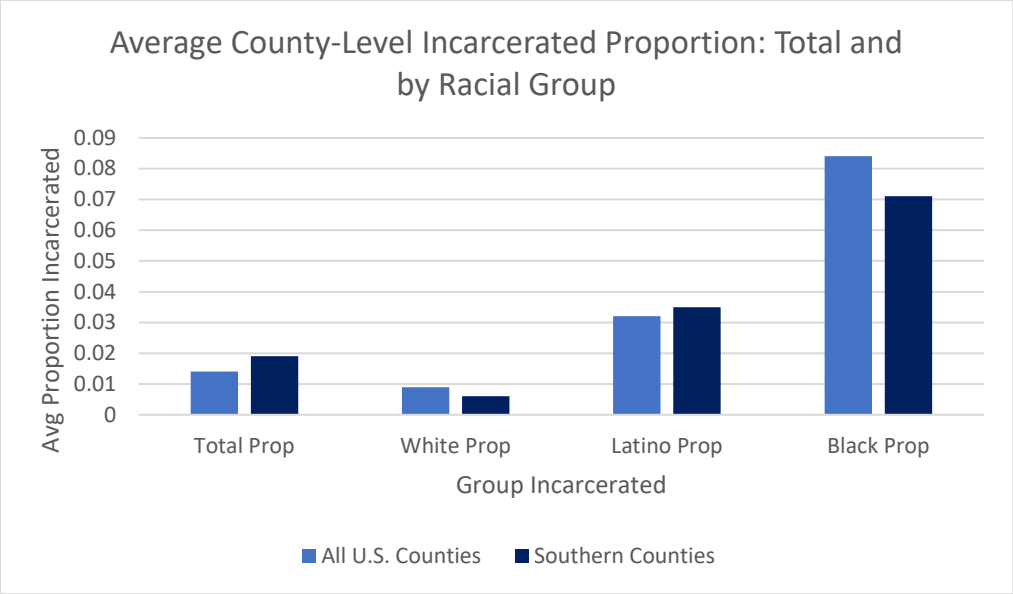
Note: Listed in origin paper: Appendix Table A.15.

## Extension Results and Discussion

The robust nature of Archaya et al's findings lead to additional questions about the reach and limitations of their behavioral path dependence theory. Does history of slavery have further explanatory power? More specifically: Does behavior path dependence extend to criminal justice outcomes?

We begin by understanding the data in the aggregate to observe any differences in outcomes by race (See Figure 2). There is a higher overall proportion of incarceration in Southern counties compared to all U.S. counties. Most pronounced is the high levels of black incarceration compared to other racial groups. It is also of note that black proportion incarcerated is lower in Southern counties than in the total county population. As noted above, this analysis was conducted on both the sample of Southern counties and the full population of counties with key findings unchanged. Therefore, the remaining analysis discusses effects in Southern counties specifically to mirror Archarya et al's approach.

**Figure 2. County-level Incarcerated Proportion.**




The results of each of the three models for the outcome variables are presented in Table 6. They defy the expectations of both hypotheses. When observing the effect of proportion of slavery in 1860 on proportion of a county incarcerated today, we actually see that as slavery increases, incarcerated proportion decreases. The effects are small as is the $R^2$ in each model, and the base regression model is not significant, while the state fixed effects and 1860 covariates models are only significant at the 0.1 level. Overall, there is a weak association between proportion of slavery in 1860 and proportion of incarceration today. Where the results get interesting and unexpected, are when we examine proportion of incarceration by race. White incarcerated proportion is positive and significant in all three models. As proportion of slavery in 1860 increases, the proportion of white people incarcerated also increases. The $R^2$ increases to 13% in the state fixed effects and 1860 covariates models. Latino proportion is also positive and significant across models with higher effects on incarceration than white but a lower $R^2$. So far these findings connect to what Gottlieb and Flynn (2021) found in their research on slavery's

impact on incarceration. However, when we examine the effect on black proportion incarcerated, the effects become negative and significant across models. As proportion of slavery increases, proportion of black residents incarcerated decreases. The effects are the largest here but the $R^2$ remains small. Even though black Americans both across the country and in the South experience higher proportion of incarceration than other racial groups, these results suggest that a lasting impact of slavery is not driving that disproportion, though it could be driving more punitive outcomes for white and Latino residents.

**Table 6. Effects of Slavery on Incarceration Proportion Total and By Race**

| | Total Incarcerated Prop | | | White Prop | | | Latino Prop | | | Black Prop | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (1) | (2) | (3) | (1) | (2) | (3) | (1) | (2) | (3) |
| Prop. Slave, 1860 | -0.001 | -0.014* | -0.014* | 0.012*** | 0.011*** | 0.009** | 0.036*** | 0.042** | 0.044** | -0.106*** | -0.085*** | -0.078*** |
| | (0.006) | (0.007) | (0.008) | (0.003) | (0.003) | (0.004) | (0.014) | (0.018) | (0.019) | (0.021) | (0.027) | (0.029) |
| State Fixed Effects | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ |
| 1860 Covariates | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| N | 1,242 | 1,242 | 1,100 | 1,242 | 1,242 | 1,100 | 1,242 | 1,242 | 1,100 | 1,242 | 1,242 | 1,100 |
| $R^2$ | 0.00002 | 0.037 | 0.052 | 0.015 | 0.139 | 0.136 | 0.005 | 0.034 | 0.050 | 0.020 | 0.054 | 0.067 |

*p < .1; **p < .05; ***p < .01

Note: Model 1: Base OLS, Model 2: State Fixed Effects, and Model 3: 1860 Covariates and State Fixed Effects.

## Next Steps

### *Methodology of This Study*

There are additional robustness checks and data explorations that could benefit these initial expansion findings. To begin, running the models with 1860 covariates separated out from fixed effects can overcome some of the limitations of modeling both fixed effects and controls simultaneously. This expansion mirrored the methodology of the original study, but using a host of covariates with fixed effects violates the underlying rationale of fixed effects. Further, there are a large number of zero values in the incarceration data. It was confirmed that there are true values of zero throughout the data, but it is also possible that zeroes are used to

communicate missing values as well. A county-by-county check in all datasets to reconcile any discrepancies is a needed next step to ensure data reliability.

### *Future Research*

Incarceration proportion may not be the best measure of county-level system effects. These numbers are impacted by where jails and prisons are located. Incorporating additional criminal justice outcomes that better isolate specific system actors may be more insightful. For example, county arrest rates can capture law enforcement practices, bond decisions and sentence lengths can connect to judicial practices, and conviction rates and assignment of the death penalty can get at jury practices. Expanding this area of study to other criminal justice outcomes could lend insight to where and if path dependence extends to criminal justice, and why some of the findings in this first-step analysis differ from Gottlieb's work (2021). Overall, further exploration is needed to explain why black disproportionality is higher in the South. It may be that more traditional explanations of ideology continue to have the most explanatory power.

## Conclusion

Archaya et al. (2016) find support for a path dependence theory that explains the lasting impact of slavery on white political beliefs and behavior today. Results from this replication mirror their findings and support their original research and theory. As proportion of slavery in 1860 goes up in a county, proportion of democratic voting and support for affirmative action go down, while racial resentment measures go up (See Table 3). These findings hold across specification models and through an instrumental variable approach (See Table 3 and Table 4). Alternative explanations of antebellum era politics and income inequality are tested and determined to not hold as alternate explanations (See Table 4 and Figure 1).

Expanding their research to criminal justice outcomes of proportion incarcerated and proportion incarcerated by race, highlight interesting differences but do not support the original authors' path dependence theory. Incarcerated proportion and black proportion incarcerated are both negatively affected by proportion of slavery, while white and Latino incarcerated proportion are positively affected by proportion of slavery (See Table 6). Additional robustness and data reliability checks, along with additional criminal justice outcome measures, are recommended to isolate the disparate outcomes we observe at state, regional, and country wide levels. This initial research suggests that is it not proportion of slavery in 1860 that is explaining these differences today.

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