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Incarceration and Relative Poverty in Cross-National Perspective: The Moderating Roles of Female Employment and the Welfare State

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Incarceration and Relative Poverty in Cross-National Perspective: The Moderating Roles of Female Employment and the Welfare State

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Abstract: A growing body of scholarship explores how incarceration contributes to inequality. The majority of this scholarship focuses on individual-level outcomes or aggregate outcomes within the United States. Despite substantial cross-national variation in incarceration rates, we know little about whether these differences contribute to cross-national variation in inequality outcomes. Using data from the period 1971–2010 from 15 advanced democracies, this study begins to fill this gap by exploring whether cross-national differences in incarceration rates help to explain cross-national differences in relative poverty rates. Although this research finds no average association, this null association obscures the important moderating role of country context. The association between incarceration and relative poverty is contingent upon a country's female employment rate and welfare state generosity.

Introduction

Rich democratic countries vary substantially in the degree to which they successfully minimize relative poverty. Liberal democratic states (characterized by great emphasis on means-tested assistance) tend to have the highest relative poverty rates, followed by conservative democratic states (those characterized by more generous benefits than liberal democracies but with little redistribution), with social democratic states (characterized by universal benefits that greatly redistribute income) performing the best (Esping-Andersen, 1990). For instance, in the year closest to 2000 (the most recent time period for which there is poverty data for the entire sample), the relative poverty rate was 14.26 percent in liberal democratic countries, 8.06 percent in conservative democratic countries, and 5.98 percent in social democratic countries (LIS, 2014b).

A long line of research has proposed possible reasons for this variation (Brady, 2003b; Kenworthy, 1999; Moller, Huber, Stephens, Bradley, and Nielsen, 2003). Previous scholarship has pointed to the importance of institutions for understanding why some countries mitigate relative poverty better than others. Specifically, scholars have found that differences in the welfare state, unions, and the strength of left political parties all play a role in explaining cross-national variation in relative poverty (Brady, 2003b; Kenworthy, 1999; Moller et al., 2003). One commonality among the institutions emphasized is that they provide support for the disadvantaged: strong welfare states redistribute resources to the disadvantaged, left political parties fight for policies that aid the disadvantaged, and strong unions fight for policies that increase the wages of workers (Brady, 2003b; Moller et al., 2003).

However, marginalized individuals are not solely impacted by supportive institutions; they are also impacted by the criminal justice system, an institution that is designed to punish (Wacquant, 2009). Wacquant (2009) demonstrates that the criminal justice system has, over time, become an increasingly important tool used to manage the disadvantaged across a number of advanced democratic countries and that there is wide variation among advanced democracies in the degree to which they rely upon incarceration. If incarceration rates influence family incomes at the bottom of the economic distribution, then a country's criminal justice system may be an important determinant of its relative poverty rate. Therefore, a complete institutional explanation of why countries have different relative poverty rates must consider whether variations in punitive institutions, such as the criminal justice system, are an important explanatory factor.

This study builds on the cross-national relative poverty literature by incorporating the criminal justice system into the analysis. Using unbalanced panel data from 15 advanced democratic countries from 1971-2010, I demonstrate that advanced democracies vary greatly in their rates of incarceration over time. When countries have high rates of incarceration, they also tend to have high rates of relative poverty, although the relationship disappears once unobservable time-stable cross-country differences are accounted for. However, the null average association obscures the important moderating role of country context. The association between incarceration and relative poverty is contingent upon a country's female employment rate and welfare state generosity.

Incarceration as a Punitive Institution

In recent years, a growing literature has explored why incarceration rates vary across time and country. One of the key findings in this literature is that incarceration is not just a technical response to crime. Instead, incarceration is a policy decision that is influenced by a broad range of social, political, and cultural factors, such as modernization, strength of left institutions, welfare state strength, and economic performance (Garland, 2001; Jacobs & Kleban, 2003; Sutton, 2004; Sutton, 2013; Wacquant, 2009).

Scholars have long argued that state institutions play an important role in managing the lives of the disadvantaged (Fernández-Kelly, 2015; Piven & Cloward, 1993; Wacquant, 2009). From Wacquant's (2009) standpoint, incarceration is one of two ways the state manages marginalized populations in neoliberal societies, along with the welfare state. In the past, as Piven and Cloward (1993) argued, welfare state provisions were used to manage the disadvantaged. Increasingly, in countries like the U.S., Wacquant (2009) argues that policy-makers have decided to manage marginalized populations punitively through incarceration rather than generously through welfare state provisions.

Incarceration and Poverty

A growing body of literature shows that incarceration has important implications for inequality outcomes on the individual level in the United States (Geller, Garfinkel, & Western, 2011; Gottlieb, 2016; Western, 2006; Wildeman, Schnitker, & Turney, 2012). However, much less is known about whether incarceration rates have an impact on inequality outcomes in the aggregate, particularly in a cross-national context (Western &

Muller, 2013; Wildeman, 2016). In the one study that has explored the cross-national implications of incarceration, Wildeman (2016) found that countries with high rates of incarceration tended to have worse health outcomes in the aggregate, but that finding was driven solely by the United States.

Although no research has explored whether incarceration rates are associated with relative poverty rates on a cross-national level, prior scholarship provides some insight into the nature of this relationship. Existing theory and research do not, however, provide a clear indication of the direction of the average association: some evidence suggests that higher rates of incarceration may be associated with higher rates of relative poverty, while other evidence suggests the opposite. Furthermore, existing scholarship suggests that both a country's female employment rate and welfare state generosity likely moderate the association between incarceration and relative poverty rates.

Why increases in incarceration may be associated with higher poverty rates on average

Prior scholarship points to several mechanisms that suggest that higher rates of incarceration may be associated with higher rates of relative poverty. Each of these mechanisms operates primarily by harming those at the bottom of the distribution[1]. One mechanism through which higher incarceration rates may lead to higher relative poverty rates is by reducing income on the individual/family level. When a person is in prison and incapacitated, he/she is unable to meaningfully contribute to family income (DeFina & Hannon, 2013). Furthermore, even after exiting prison, a formerly incarcerated person's earnings may be reduced. Scholarship suggests that it is more difficult for people with a criminal record to find employment, and that individuals with a criminal record earn

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[1] Relative poverty increases when income levels at the bottom decrease or when income levels at the middle increase faster than those at the bottom.

lower wages when employed due to stigma, skill erosion, the weakening of social networks, and the acquisition of traits (during their incarceration spell) not conducive to good job performance (DeFina & Hannon, 2010; Pager, 2003; Western, 2006).

Additionally, incarceration may reduce the earnings of non-incarcerated family members, particularly in families where adults care for children or the elderly. If one caregiver is unable to provide care because he/she is incarcerated, the other caregivers are likely to have to take on a greater caregiving role, making it more difficult for them to find or keep a decent-paying job (DeFina & Hannon, 2013). Lastly, families who experience incarceration may, as a result, have less access to financial support (private financial transfers) from family members (Turney, Schnitker, & Wildeman, 2012). Since private financial transfers have been found to be an important source of income for low-income families, this may have a substantial impact on their risk of poverty (Edin & Lein, 1997; Gottlieb, Pilkauskas, & Garfinkel, 2014).

A second mechanism through which incarceration can lead to high rates of relative poverty is by increasing single parenthood, a factor found in prior work to be associated with relative poverty (Brady, 2006; Brady, Fullerton, & Cross, 2010). On an individual level, studies have found that current incarceration is associated with a decreased likelihood of getting married and an increase in divorce (Massoglia, Remster, & King, 2011). In the aggregate, Wilson (1987) argues that when men are less attractive as partners (have worse/no job, lower levels of education, a criminal record, etc), marriage rates decline. Empirically, evidence shows that increases in male incarceration rates have resulted in a decrease in the probability that women marry (Charles & Luoh, 2010).

<u>Why increases in incarceration may be associated with reduced poverty rates on average</u>

On the other hand, some evidence suggests that higher rates of incarceration may be associated with lower rates of relative poverty. One mechanism through which increased incarceration may be associated with reductions in poverty is by increasing the wages of low-wage workers who are not currently incarcerated. As the incarceration rate increases, the supply of low-wage workers is likely to decrease.   And as the supply of low wage workers decreases, the bargaining power of low-wage workers, and hence their wages, is likely to increase, since employers have fewer possible workers to substitute for a given job (Borjas, 2003). Moreover, this may be especially true since incarceration growth is likely to also increase the number of low/moderate wage jobs available in prisons (for those who are not incarcerated).

A second mechanism through which growing incarceration rates may reduce relative poverty is through the reduction of family size. An individual's poverty status is based not only on household income, but also on the size of the household (LIS, 2014b). As the size of the household increases, the income needed to be above the poverty threshold also increases. Thus, if incarcerated individuals tend to contribute a minimal amount of income to the household prior to incarceration, their removal may actually reduce the likelihood that members of their households will be poor.

A third mechanism through which higher rates of incarceration may be associated with lower rates of relative poverty is artificial. As Pettit (2012), Western and Beckett (1999), and Western (2006) document, people who experience incarceration are more disadvantaged on average than those who do not, even prior to their incarceration. Pettit (2012) systematically shows that incarcerated individuals are not captured in household

level surveys (such as those used to calculate poverty statistics) while incarcerated, and even after they exit prison/jail they are still often missed by surveys. Therefore, increases in the incarceration rate have the potential to reduce relative poverty not by improving standards of living, but instead by removing some of the most disadvantaged individuals from the population used to compute poverty statistics.

Contextual Moderators: Female Employment and Welfare State Generosity

Although the direction of the average association between incarceration and relative poverty is unclear, scholarship provides clear predictions about the moderating roles of female employment and welfare state generosity.

The primary reason that the female employment rate is likely to be an important moderating factor is because the criminal justice system more directly impacts men than women. Among the 15 countries in this study's sample, as of 2010, the average female share of the prison population was approximately 5.65 percent (World Prison Brief, 2016). Therefore, incarceration is likely to directly reduce the earnings and employment of males more than females. As a result, families in low female employment countries are less likely to be able to compensate for reductions in male wages (due to incarceration) and to avoid poverty through female employment than are families in high female employment countries (Bianchi, 1999; Misra, Moller, Strader, & Wemlinger, 2012). Thus, in countries with low levels of female employment, I expect that the association between incarceration and relative poverty will be more positive than in countries with high rates of female employment.

Another aspect of the country context that is likely to moderate the association between incarceration and relative poverty is welfare state generosity. The mechanisms

predicting that high rates of incarceration are likely to lead to increases in relative poverty

suggest that this will occur largely through a reduction in labor market earnings brought

into the household, rather than by reducing the amount of government benefits received.

Welfare state generosity is likely to be an important moderating factor because it

influences the degree to which countries are able to increase low market wages and

reduce market-generated poverty (Moller, Huber, Stephens, Bradley, & Nielsen, 2003;

Smeeding, 2006). As a result, families in countries with lower levels of welfare state

generosity are less likely to be able to rely on the welfare state to substantially increase

their incomes in response to reductions in market income due to incarceration. Thus, in

countries with low levels of welfare state generosity, I expect that the association

between incarceration and relative poverty will be more positive than in countries with

high rates of welfare state generosity.

Data and Methods

<u>Data</u>

The empirical analyses focus on data from 15 advanced democracies (Australia,

Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy,

Netherlands, Norway, Sweden, United Kingdom, and United States) and span 1971-2010.

The countries were chosen because they fit within Esping-Andersen's (1990) three

regime clusters, had data on relative poverty, incarceration rates, welfare state generosity,

and female employment rates over time, and have been commonly used in the cross-

national poverty scholarship. The data structure is an unbalanced panel because the

dependent variable (relative poverty) is not observed every year and is observed in

different years for different countries. A list of countries and years of observation can be found in Appendix A.

The data for this paper come from several sources. The relative poverty data come from the LIS Cross-National Data Center (2014b). Following the well-established tradition in cross-national scholarship (Brady, 2003a), an individual is considered poor if he/she lives in a household with an income that is 50 percent of the median income or lower. Income is computed as the sum of market income and cash and near cash transfers (private transfers, public social insurance, and public social assistance), net of income taxes and mandatory payroll taxes (LIS, 2014a). To determine whether an individual is living in poverty, income is adjusted for family size by dividing by the square root of the number of household members (LIS, 2014b).

The data for the incarceration rates were compiled by Sutton (2014). Much of the older data were collected from country sources (such as statistical abstracts), the most recent data from the European Sourcebook of Crime and Criminal Justice Statistics (Council of Europe, 2009) and Eurostat (2013), and the data for Scandinavian countries from Von Hofer, Lappi-Seppala, and Westfelt (2012). Incarceration is measured as the number of inmates, including those under sentence and on remand, per 100,000 population (Sutton, 2013). I log transform the incarceration rate and lag it one year. I log the incarceration rate because incarceration rates are severely positively skewed (Sutton, 2004; Sutton, 2013). Following Wildeman (2016), I lag the incarceration rate one year to ensure temporal priority, while still allowing for the short-term consequences of incarceration, such as incapacitation, to have an impact.

The contextual factors that are interacted with the incarceration rate come from two different sources. The female employment rate is calculated as the number of women in civilian employment divided by the number of women between 15 and 64 years of age. The data used to create this variable were compiled by Brady, Huber, and Stephens (2014) in their Comparative Welfare States Data Set from OECD, Labor Force and Employment Statistics (2013). Welfare state generosity is measured using the summary measure from the Comparative Welfare Entitlements Dataset (Scruggs, Jahn, & Kuitto, 2014). This measure captures the generosity of sickness, unemployment, and pension benefits and is quite similar to Esping-Andersen's decommodification index (Scruggs et al., 2014).

The remaining control variables were compiled by Brady et al. (2014) and are included because prior scholarship has suggested that they are important determinants of relative poverty. I control for the strength of left institutions by including measures of union density (to capture the strength of left labor market institutions) and the strength of left political parties. Union density is measured as the percentage of wage and salary employed workers in unions, and the data come from the ICTWSS database (Visser, 2013). Left political strength is measured as the share of seats in parliament won by left parties and is taken from Mackie and Rose (1991) and the Political Data Yearbook published by the European Journal of Political Research (1992-2010) in years since 1991.

The variables measuring economic performance are GDP per capita and the male employment rate. The data for GDP per capita (measured in 2005 international dollars) come from the Penn World Table 8 (Feenstra, Inklaar, & Timmer 2013). The data for the male employment rate come from the OECD, Labor Force and Employment Statistics

(2013). The male employment rate is calculated as the number of men in civilian employment divided by the number of men between 15 and 64 years of age.

The control variables measuring the structure of the economy include the percent of civilian employees working in manufacturing (reference category)[2], service, and agricultural employment. The data used to calculate manufacturing, service, and agricultural employment come from the OECD, Labor Force and Employment Statistics (2013). The manufacturing, service, and agricultural employment variables are calculated as the number of manufacturing, service, or agricultural employees divided by the total number of civilian employees.

To capture a country's demographic structure, I include measures of the age structure and urbanization of the population. Age structure is measured using three categories: the percentage of the population that is working age (reference category), the percentage of the population under age 15, and the percentage of the population 65 and over. The data on population age structure come from the OECD, Labor Force and Employment Statistics (2013). That data on urbanization come from the World databank, World Development Indicators Database (2013). Urbanization is measured as the percentage of a country's population living in urban areas.

Analytic Strategy

In this paper, I follow much of the recent literature on cross-national variation in relative poverty and inequality and use an unbalanced panel approach (Alderson &

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[2] Even though the percent is measured continuously, this is still essentially a categorical variable (and requires a reference group) because the sum of manufacturing, service, and agricultural employment must equal 100 percent. When the percent of one sector declines, by definition the share of another sector increases. This is also true for the age structure variables (described shortly) as well.

Nielsen, 2002; Brady, 2006; Moller et al., 2003). Specifically, I present models with country and period fixed effects and robust standard errors clustered at the country level. The primary advantage of fixed effects models over common alternatives, such as random effects and ordinary least squares (OLS) models, is that they control for all time invariant variables, even if the time stable variables are unobserved (Allison, 2005; Firebaugh & Beck, 1994; Halaby, 2004). In this case, given the long observation period and variety of countries in the data set, this is crucial, since time invariant characteristics, such as aspects of a country's history, may be particularly difficult to measure, but also critically important factors in explaining why some countries have lower relative poverty rates than others (Conley & Springer, 2001; Firebaugh & Beck, 1994). In addition to this advantage, Hausman tests (1978) reveal that the key random effects assumption (that the unit effects are not correlated with explanatory variables) is violated in the analyses, indicating that fixed effects models are preferred (Halaby, 2004).

The structure of the data presents a number of challenges. First, the highly unbalanced nature of the data precludes the use of more traditional time series cross-sectional methods to address AR1 autocorrelation, such as Prais Winsten regression with panel corrected standard errors (Beck & Katz, 1995; Scruggs & Allan, 2006). This is a common challenge in this scholarship, but the inclusion of country and decade fixed effects and robust clustered standard errors addresses some of the concern about lack of independence of observations across time and country (Bradley, 2003; Scruggs & Allan, 2006).

Second, the cross-national nature of my data does not allow me to address the possible simultaneous relationship between incarceration and relative poverty through the

use of an instrumental variable approach. This is important because reverse causality is of theoretical concern. Since incarceration is used to manage marginalized populations, it is possible that, rather than countries with high incarceration rates having higher poverty rates because incarceration reduces the income of marginalized people, countries with higher poverty rates have higher incarceration rates because they have more people that the state feels the need to manage punitively.   To address temporal ordering, I lag the key independent variable, the incarceration rate, one year, a strategy that is common in much of the cross-national literature (Brady, Beckfield, & Seeleib-Kaiser, 2005; Jacobs & Kleban, 2003; Sutton, 2004; Wildeman, 2016). In robustness analyses, I test the plausibility of reverse causality further by conducting analyses with the incarceration rate as the outcome of interest, lagged relative poverty as an independent variable, and key interactions between lagged relative poverty and welfare generosity and lagged relative poverty and the female employment rate. These results, described in greater detail in the additional analyses section of this chapter, do not provide evidence suggesting that reverse causality is driving the findings.

All country-years with complete data on the key variables in the study (the relative poverty rate, the incarceration rate, the female employment rate, and welfare state generosity) are included in the analyses. In the one case with missing data on control variables (service and manufacturing employment data from France in 2010), the missing values were filled in through linear interpolation. Excluding this case does not alter the results. Overall, the main analyses use 126 cases from 15 countries covering the years 1971-2010.

Results

<u>Descriptive Results</u>

Table 1 below describes relative poverty rates by country over time. Countries are grouped in Esping-Andersen's (1990) three regime clusters. Although there is substantial within country and within regime variation in relative poverty, regime differences in poverty performance remain relatively stable over time. Regardless of time period, liberal democratic countries tend to have the highest poverty rates. For instance, in 1990, each liberal democratic country had a higher poverty rate than even the worst performing social or conservative democratic country. Additionally, social democratic countries tended to reduce poverty more successfully than conservative democracies, particularly in recent decades. For example, in 2000 and 2010, all conservative democratic countries (except the Netherlands) had higher poverty rates than the worst performing social democratic country.

[Table 1 About Here]

Table 2 below describes trends in incarceration rates across countries over time. First, as with poverty rates, liberal democratic countries tend to have the highest rates, although this has become increasingly pronounced over time. For instance, in the year 2000, the four countries with the highest incarceration rates were all liberal democracies. Second, both liberal and conservative democracies have tended to experience significant increases in incarceration over time, while social democratic countries experienced little to no growth and in the case of Finland a large decline. Third, although conservative and social democracies had similar incarceration rates in the 1970s, the much larger growth

over time among conservative democracies has resulted in social democracies currently having the lowest rates.

[Table 2 About Here]

Regression Results: The Association between Incarceration and Poverty

Table 3 presents results from four nested regression models that explore the association between a country's incarceration rate and its relative poverty rate and whether the association varies depending upon a country's female employment rate and welfare state generosity. To interpret the coefficients from these models in terms of a one percent change, I use the following approximation: when $p = 1$, $\beta/\hat{\ }100$ represents approximately the expected increase in Y from a one percent increase in X (Benoit, 2011). It is important to note that this approximation only holds for small values; therefore, one cannot extrapolate for larger values by multiplying the coefficient associated with a one percent change by a larger value (a 100 percent change cannot be estimated by multiplying the estimate for one percent by 100, for instance).

In Model 1, I test the bivariate association between the incarceration rate and the relative poverty rate. Without controlling for confounding factors, a one percent increase in the incarceration rate is associated with approximately a 0.0435 percentage point increase in the relative poverty rate ($p<0.01$). This confirms what the descriptive statistics documented: countries with higher incarceration rates tend to also have higher poverty rates. However, these countries differ in many other ways, so multivariate models are crucial for isolating the association.

In Model 2, I add controls for left institutions, economic performance, economic structure, demographic structure, and decade fixed effects. After including these

covariates, the association is reduced substantially, although it remains statistically significant: A one percent increase in the incarceration rate is associated with a 0.0165 percentage point increase in the relative poverty rate. In Model 3, I control for all time stable country factors by adding country fixed effects. Once country fixed effects are accounted for, there is no longer a significant association between incarceration and relative poverty. Therefore, the results from Model 3 suggest that there is no evidence of an average association between a country's incarceration and relative poverty rates.

In Model 4, I add two interactions to examine whether the association between incarceration and relative poverty varies depending upon a country's female employment rate and the generosity of its welfare state. The results provide support for the view that there is contextual heterogeneity in the association. For every percentage point increase in the female employment rate, the association between a one percent increase in the incarceration rate and the relative poverty rate becomes more negative by 0.0014 percentage points (P<0.01). Moreover, for every unit increase in welfare generosity, the association between a one percent increase in the incarceration rate and the relative poverty rate becomes more negative by 0.0018 percentage points (P<0.05).

A few important observations are worth noting about the other independent variables from Model 4. First, there is some support for the perspective that strong left institutions influence a country's relative poverty rate, since an increase in welfare state generosity is associated with a marginally significant reduction in a country's relative poverty rate. Second, the results suggest that economic structure also influences poverty, as an increase in the female employment rate is associated with a marginally significant reduction in relative poverty. Third, demographic structure appears to be important, as an

increase in the share of the population that is elderly (compared to working age) is associated with a statistically significant increase in relative poverty. Lastly, economic performance appears to have some impact on a country's relative poverty rate. An increase in GDP per capita is associated with an increase in a country's relative poverty rate, suggesting that the middle of the economic distribution may benefit more than the bottom of the distribution from GDP growth.

[Table 3 About Here]

Although Model 4 demonstrates that the association between incarceration and relative poverty varies depending upon country context, the results do not demonstrate whether incarceration actually impacts relative poverty at any of the levels of female employment and welfare generosity experienced by countries in the sample. In Table 4, I further explore the implications of these interactions for the main association between incarceration and relative poverty in different country contexts. The coefficients in the table represent the association between incarceration and relative poverty at the average levels of female employment and welfare generosity experienced from 1971 to 2010 for each of the countries in the sample.

The results from Table 4 lead to a number of conclusions. First, at the average levels of female employment and welfare generosity experienced in liberal democratic countries (with the exception of the United Kingdom), increases in incarceration are associated with increases in relative poverty. Specifically, a one percent increase in incarceration is associated with a 0.0341, 0.0289, 0.0231, and 0.0178 percentage point increase in relative poverty at the average levels of female employment and welfare generosity experienced in Ireland, Australia, the U.S, and Canada, respectively. In all

cases with the exception of Ireland, these associations are driven largely by low levels of welfare generosity, rather than by low levels of female employment.

Among social democratic countries, incarceration rates are only significantly associated with relative poverty at the average female employment and welfare generosity levels found in Sweden. Specifically, a one percent increase in incarceration is associated with a 0.0303 percentage point decrease in relative poverty. This association is driven by Sweden's high levels of both female employment and welfare generosity. Lastly, among conservative democratic countries, incarceration rates are only significantly associated with relative poverty rates at the female employment and welfare generosity levels experienced by Italy: A one percent increase in incarceration is associated with a 0.0434 percentage point increase in relative poverty. In this instance, the association is driven by low levels of both welfare generosity and female employment.

[Table 4 About Here]

The results from Table 4 suggest that incarceration rates are associated with poverty rates in certain country contexts. In Table 5, I conduct simulations to explore how large a role incarceration may have had in shaping poverty rates in these country contexts. To do so, I predict each country's poverty rate in two different scenarios. In both scenarios, all control variables are held constant at the mean country value from 1971 to 2010. The only difference between the scenarios is that the incarceration rate is set at the country mean (from 1971-2010) in the first scenario, while in the second scenario the incarceration rate is set at the country minimum.

Given the small sample size (126 country-years), confidence intervals are often wide, so it is important to view these estimates cautiously. Not surprisingly, incarceration is estimated to be most important in the U.S. context. At the country mean incarceration rate, the predicted relative poverty rate is 17.53 percent compared to 15.19 percent at the country minimum. Even with a conservative prediction (the high end of the confidence interval at the incarceration minimum), the poverty rate is estimated to be 0.73 percentage points lower at the incarceration minimum (16.80 percent) than at the incarceration mean.

In Sweden's context (the one instance in which increases in incarceration are associated with reductions in poverty), the practical significance of incarceration appears more modest. At the incarceration mean, the predicted poverty rate in Sweden is 6.53 percent compared to 7.17 at the country minimum. With the conservative prediction (at the bottom of the incarceration minimum confidence interval), the estimated poverty rate at the incarceration minimum (6.57 percent) is only 0.04 percentage points higher than at the country mean.

[Table 5 About Here]

Additional Analyses

To test the robustness of the findings described above, I conducted a number of additional analyses. First, I explored the possibility that reverse causality explains the results by conducting the main analyses in Table 3, but this time with incarceration as the outcome, poverty lagged one year, and key interactions between welfare generosity and poverty and female employment and poverty. The results from these analyses (which can

be found in Appendix B) do not support the view that reverse causality explains the results, since the interactions suggest that there is no evidence that poverty's association with incarceration varies depending upon a country's welfare generosity and female employment levels (P<0.76 and P<0.73, respectively).

Second, I explored whether the results were driven by any one country in the analysis. To do so, I systematically excluded one country at a time (a jackknifed analysis) from the final model in Table 3, and found that the pattern of the interactions were quite similar regardless of the country that was dropped (See Appendix C).

Third, each of the mechanisms through which incarceration is expected to be associated with relative poverty are predicated on the view that incarceration rates influence relative poverty by impacting incomes at the bottom, rather than at the middle, of the distribution. Therefore, for the associations I found to be plausible, one would expect to observe the same patterns in analyses in which the absolute well-being of the bottom 10 percent of the population is the outcome of interest. As can be seen in Appendix D, using data from the LIS Cross-National Data Center/New York Times (2014), I find this to be the case: the association between incarceration and the material well-being of the bottom 10 percent becomes more positive when female employment and welfare generosity are high.

Lastly, I explored whether the interaction observed between female employment and incarceration is actually an interaction between incarceration and economic context more generally by adding an interaction between the male employment rate and the incarceration rate to Model 4 in Table 3. I do not find evidence that this is the case. As can be seen in Appendix E, the interactions between female employment and

incarceration and welfare generosity and incarceration remained statistically significant, while I found no significant interaction between male employment and incarceration rates.

Discussion

This paper explores the association between incarceration rates and relative poverty rates in advanced democratic countries from 1971-2010. Three key findings emerge from this study. First, bivariate regressions demonstrate that countries with high rates of incarceration also tend to have high relative poverty rates. Second, the bivariate association disappears once a full set of covariates are accounted for, suggesting that the bivariate association is likely spurious. Lastly, the null average association obscures important heterogeneity in the association between incarceration and relative poverty: the association varies depending upon a country's female employment and welfare state generosity levels. At low levels of female employment or welfare state generosity (at levels experienced in Australia, Canada, Ireland, Italy, and the US), increases in incarceration are associated with higher levels of relative poverty, while at high levels of female employment and welfare state generosity (at levels experienced in Sweden), increases in incarceration are associated with reductions in relative poverty.

These findings make a number of important contributions to existing scholarship. First, despite substantial variation in incarceration rates across countries, scholarship has only minimally explored whether this variation helps to explain cross-national differences in inequality outcomes (Wildeman, 2016). This is a crucial oversight because of the importance placed upon institutions in the cross-national literature on inequality outcomes. Much of the prior research seeking to explain cross-national variation in

relative poverty has found that institutions play an important role (Brady, 2003b; Kenworthy, 1999; Moller et. al., 2003). However, this research does not provide a complete exploration of the role of institutions because it tends to focus exclusively on institutions, like the welfare state, that provide support to individuals. However, marginalized individuals are impacted by more than just generous state institutions; they are also affected by the criminal justice system, an institution that punishes the disadvantaged. Given the finding that incarceration rates are associated with relative poverty rates in certain contexts, I argue that incarceration may be an important factor for understanding cross-national variation in other inequality outcomes as well.

Second, these results highlight the importance of heterogeneity in understanding the impact of incarceration and institutions more generally. Institutions, such as the criminal justice system, do not operate in a vacuum and are likely to differentially impact individuals depending upon country context. As a result, I argue that future work exploring the implications of incarceration for inequality outcomes should be conscious of possible factors that may exacerbate or mitigate incarceration's impact.

The contributions of these findings must be considered alongside their limitations. Most critically, the models and results are based on observational data at the country level. Despite the use of models that include country and period fixed effects, it is not possible to eliminate the possibility that a time-varying and unobserved factor accounts for the significant interactions between female employment and incarceration and welfare state generosity and incarceration. Moreover, even though the incarceration rate is lagged, the lack of an effective instrument means that I cannot entirely rule out that the findings are driven by reverse causality entirely. However, the fact that interactions

between the female employment rate and the lagged poverty rate and welfare generosity and the lagged poverty rate are not significant predictors of a country's incarceration rate limits this concern. Third, the data only capture one aspect of the criminal justice system: jail and imprisonment. As Brayne (2014) has shown, even more minor criminal justice involvement, such as contact with the police, has negative implications for individuals.

Notwithstanding these issues, this study makes a number of important contributions to existing scholarship. First, despite substantial variation in incarceration rates across countries, scholarship has only minimally explored whether this variation helps to explain cross-national differences in inequality outcomes (Wildeman 2016). This is a crucial oversight because of the importance placed upon institutions in the cross-national literature on inequality outcomes. Much of the prior research seeking to explain cross-national variation in relative poverty finds that institutions play an important role (Kenworthy 1999; Brady 2003a; Moller et. al. 2003). However, this research does not provide a complete exploration of the role of institutions because it tends to focus exclusively on institutions, like the welfare state, that provide support to individuals. Marginalized individuals are affected by more than just generous state institutions; they are also affected by the criminal justice system, an institution that punishes the disadvantaged. Given the finding that incarceration rates are associated with relative poverty rates in certain contexts, I argue that incarceration may be an important factor for understanding cross-national variation in other inequality outcomes as well.

Second, these results highlight the importance of heterogeneity in understanding the influence of incarceration and institutions more generally. Institutions, such as the

criminal justice system, do not operate in a vacuum and are likely to differentially affect

individuals depending upon country context. As a result, I argue that future work

exploring the implications of incarceration for inequality outcomes should be conscious

of possible factors that may exacerbate or mitigate incarceration's affect.

Finally, the findings from this study have potentially important implications for

policy. As the results demonstrate, incarceration has likely had the greatest influence on

relative poverty in liberal democracies. This is primarily because liberal democratic

governments have made two important policy decisions: they have decided to provide

less generous welfare benefits and to punish criminal offenses more harshly than

governments in social and conservative democracies (Wacquant 2009).

In the United States, the advanced democracy with perhaps the least generous

welfare state and far and away the highest rate of incarceration, the implications appear to

be particularly important for poverty reduction (Garland 2001; Wacquant 2009). In recent

years, the United States has begun to slowly reduce its incarceration rate for the first time

in decades, and some states, like California, have taken more dramatic steps (Lofstrom

and Raphael 2016; Pickett 2016). Although declines in incarceration have, on balance,

been modest, there has been a substantial increase in public support for criminal justice

reform (Ramirez 2013; Wozniak 2016; Gottlieb 2017). Moreover, political elites on both

sides of the aisle are increasingly voicing their support for further reform (Aviram 2015;

Percival 2015).

Currently, activists and politicians who support criminal justice reform tend to

justify their position by emphasizing fiscal savings, the ineffectiveness of prison as a

crime reduction tool, and the racial disparities in incarceration (Aviram 2015; Percival

2015; Gottschalk 2016). This study provides another reason for policy makers and the public to support criminal justice reform. Given the lack of generosity of the US welfare state, further reductions in incarceration may help the United States reduce its poverty rate, which is currently far higher than that of most other advanced democracies.

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Tables

Table 1: Relative Poverty Rate by Country and Decade

	~1970	~1980	~1990	~2000	~2010
Liberal Democracies					
USA	15.49	14.98	17.55	16.57	16.94
Australia	N/A	11.29	12.17	13.01	13.94
Canada	16.12	12.42	10.96	12.37	12.55
Ireland	N/A	N/A	12.55	16.15	9.40
United Kingdom	9.08	8.95	14.60	13.19	15.36
Social Democracies					
Denmark	N/A	N/A	7.16	5.39	6.32
Finland	N/A	N/A	5.51	5.47	7.46
Norway	N/A	4.97	6.44	6.45	7.43
Sweden	6.48	5.32	6.67	6.61	5.60
Conservative Democracies					
Austria	N/A	N/A	6.65	7.74	N/A
Belgium	N/A	4.46	5.14	8.08	N/A
France	N/A	10.29	8.94	7.33	9.12
Germany	6.75	5.30	5.62	7.63	9.55
Italy	N/A	N/A	9.65	12.71	12.48
Netherlands	N/A	6.26	6.33	4.91	5.19

Table 2: Incarceration Rate by Country and Decade

	1970	1980	1990	2000	2010
Liberal Democracies					
USA	170.57	217.54	453.42	685.84	731.40
Australia	78.75	66.25	83.67	113.30	133.37
Canada	89.18	89.03	105.23	102.56	109.70
Ireland	25.28	35.55	59.70	75.90	79.55
United Kingdom	80.78	89.62	91.14	123.22	152.05
Social Democracies					
Denmark	70.16	63.24	66.62	63.34	71.44
Finland	111.59	106.45	69.01	55.19	61.35
Norway	43.64	43.98	56.09	57.05	74.21
Sweden	65.28	54.92	58.15	60.11	73.58
Conservative Democracies					
Austria	110.77	107.38	83.31	87.61	102.42
Belgium	67.60	57.65	65.83	85.38	102.39
France	55.91	64.70	75.47	80.37	102.78
Germany	59.39	65.21	56.05	85.31	86.36
Italy	41.48	54.02	46.01	94.83	112.24
Netherlands	18.77	22.78	44.25	80.06	86.01

Table 3: Regression Models Estimating Association between Incarceration and Relative Poverty

Incarceration Rate (Logged)	4.35 (0.48)**	1.65(0.50)**	1.20(1.12)	0.81(0.82)
Welfare Generosity		-0.31(0.06)**	-0.14(0.06)*	-0.13(0.07)+
Female Employment Rate (Percent)		-0.05(0.06)	-0.13(0.09)	-0.17(0.08)+
Welfare Generosity*Incarceration				-0.18(0.07)*
Female Employment*Incarceration				-0.14(0.04)**
Union Density		0.00 (0.02)	-0.09(0.05)	-0.06(0.06)
Left Party strength		-0.00 (0.00)	-0.00(0.00)	-0.00(0.00)
GDP per capita (In Thousands)		0.12(0.05)*	0.17(0.06)*	0.22(0.06)**
Male employment rate (Percent)		-0.00(0.11)	0.11(0.16)	0.15(0.15)
Service Employment Share (Reference=Manufacturing)		0.03(0.11)	-0.10(0.19)	-0.02(0.19)
Agricultural Employment Share (Reference=Manufacturing)		-0.15(0.16)	0.07(0.28)	0.35(0.29)
Urban		-0.08(0.03)**	-0.13(0.13)	-0.14(0.14)
Percent <15 years old (Reference =Percent 15-64)		0.36(0.17)*	0.02(0.18)	-0.01(0.15)
Percent age 65 and over (Reference=Percent 15-64)		0.31(0.24)	0.39(0.19)+	0.37(0.16)*
1980s (Reference=1970s)		0.57(0.70)	1.05(0.65)	1.43(0.69)+
1990s (Reference=1970s)		0.44(1.11)	1.71(1.03)	2.23(1.04)*
2000s (Reference=1970s)		-0.46(1.54)	0.77(1.34)	1.46(1.37)
Constant	-9.70(2.43)**	5.95(11.91)	19.06(11.87)	12.10(10.89)
Country Fixed Effects	No	No	Yes	Yes
Country-years	126	126	126	126

Note: Robust standard errors in parentheses clustered at the country level. The interactions are centered at mean values. +P<0.10, *P<0.05, **P<0.01 (two-tailed tests)

Table 4: The Impact of Incarceration on Relative Poverty at Country Averages for Female Employment Rate and Welfare Generosity

	Coefficient
Liberal Democracies	
Australia	2.89 (0.98)*
Canada	1.78 (0.80)*
Ireland	3.41 (1.11)**
United States	2.31 (0.89)*
United Kingdom	1.13 (0.75)
Social Democracies	
Denmark	-1.55 (1.01)
Finland	-0.78 (0.86)
Norway	-2.07 (1.21)
Sweden	-3.03 (1.37)*
Conservative Democracies	
Austria	1.02 (0.84)
Belgium	0.89 (1.12)
France	0.31 (0.98)
Germany	0.59 (0.90)
Italy	4.34 (1.29)**
Netherlands	0.72 (1.01)

Note: Robust standard errors in parentheses clustered at the country level.
+$P<0.10$, *$P<0.05$, **$P<0.01$ (two-tailed tests)

Table 5: Simulated Poverty Rates at Country Averages for Independent Variables with Incarceration Rate at Country Mean Compared to Country Minimum

	Mean	Minimum
Liberal Democracies		
USA	17.53 (17.11-17.95)	15.19 (13.58-16.80)
Australia	14.39(12.90-15.87)	13.27(12.21-14.33)
Canada	12.51(12.33-12.69)	12.18(11.98-12.39)
Ireland	13.11(11.65-14.57)	11.24(9.76-12.72)
Social Democracies		
Sweden	6.53(6.08-6.98)	7.17 (6.57-7.78)
Conservative Democracies		
Italy	12.24(11.44-13.03)	10.33(9.21-11.46)

Note: Confidence Intervals for Predictions are in Parentheses

Appendix A

List of countries, welfare state regime, and years in sample

Country	Welfare Regime	Years
United States	Liberal	1974, 1979, 1986, 1991, 1994, 1997, 2000, 2004, 2007, 2010
Australia	Liberal	1981, 1985, 1989, 1995, 2001, 2003, 2008, 2010
Canada	Liberal	1971, 1975, 1981, 1987, 1991, 1994, 1997, 1998, 2000, 2004, 2007, 2010
Ireland	Liberal	1987, 1994, 1995, 1996, 2000, 2004, 2007, 2010
United Kingdom	Liberal	1974, 1979, 1986, 1991, 1994, 1995, 1999, 2004, 2007, 2010
Denmark	Social	1987, 1992, 1995, 2000, 2004, 2007, 2010
Finland	Social	1987, 1991, 1995, 2000, 2004, 2007, 2010
Norway	Social	1979, 1986, 1991, 1995, 2000, 2004, 2007, 2010
Sweden	Social	1975, 1981, 1987, 1992, 1995, 2000, 2005
Austria	Conservative	1987, 1994, 1995, 1997, 2000, 2004
Belgium	Conservative	1985, 1988, 1992, 1995, 1997, 2000
France	Conservative	1978, 1984, 1989, 1994, 2000, 2005, 2010
Germany	Conservative	1973, 1978, 1981, 1983, 1984, 1989, 1994, 2000, 2004, 2007, 2010
Italy	Conservative	1986, 1987, 1989, 1991, 1993, 1995, 1998, 2000, 2004, 2008, 2010
Netherlands	Conservative	1983, 1987, 1990, 1993, 1999, 2004, 2007, 2010

Appendix B:

Regression Models Testing for Reverse Causality (Incarceration is Outcome Variable)

	Model 1	Model 2
Poverty Rate (Lagged)	0.02 (0.01)+	0.02 (0.01)+
Welfare Generosity	0.03 (0.02)	0.03 (0.03)
Female Employment Rate (Percent)	0.01 (0.02)	0.01 (0.02)
Welfare Generosity*Incarceration		-0.00 (0.00)
Female Employment*Incarceration		0.00 (0.00)
Union Density	-0.02 (0.01)**	-0.02 (0.00)**
Left Party strength	0.00 (0.00)	0.00 (0.00)
GDP per capita (In Thousands)	0.01 (0.01)	0.01 (0.01)
Male employment rate (Percent)	-0.01 (0.01)	-0.01 (0.01)
Service Employment Share (Reference=Manufacturing)	-0.01 (0.02)	-0.01 (0.02)
Agricultural Employment Share (Reference=Manufacturing)	0.02 (0.04)	0.02 (0.03)
Urban	0.05 (0.02)*	0.05 (0.02)*
Percent <15 years old (Reference =Percent 15-64)	0.06 (0.03)*	0.06 (0.03)+
Percent age 65 and over (Reference=Percent 15-64)	0.05 (0.03)	0.04 (0.04)
1980s (Reference=1970s)	0.22 (0.15)	0.21 (0.12)+
1990s (Reference=1970s)	0.24 (0.22)	0.23 (0.18)
2000s (Reference=1970s)	0.20 (0.21)	0.19 (0.19)
Constant	3.09 (4.23)	2.80 (4.29)
Fixed Effects	Yes	Yes
Number of Observations	112	112

Note: Robust standard errors in parentheses clustered at the country level. The interactions are centered at mean values. $+P<0.10$, $*P<0.05$, $**P<0.01$ (two-tailed tests)

Appendix C

Jackknifed Coefficients for Key Interactions

| Country Dropped | Coefficient of Interaction With Incarceration | |
	Welfare Generosity	Female Employment
Australia	-0.20	-0.15
Austria	-0.16	-0.14
Belgium	-0.18	-0.13
Canada	-0.13	-0.12
Denmark	-0.19	-0.14
Finland	-0.19	-0.14
France	-0.19	-0.14
Germany	-0.20	-0.14
Ireland	-0.16	-0.12
Italy	-0.17	-0.11
Netherlands	-0.12	-0.19
Norway	-0.22	-0.15
Sweden	-0.13	-0.12
United Kingdom	-0.14	-0.10
United States	-0.28	-0.11

Note: The Interactions are Centered at Mean Values. Fifteen Analyses were Conducted, each Dropping a Different Country

Appendix D

Regression Models Estimating Association between Incarceration and Income of the Bottom 10%

	Model 1	Model 2
Incarceration Rate (Logged)	-422.76 (651.63)	70.34(445.17)
Welfare Generosity	-72.10(74.08)	3.98(74.18)
Female Employment Rate (Percent)	-7.79(47.02)	-24.84(29.65)
Welfare Generosity*Incarceration		198.59(54.73)**
Female Employment*Incarceration		61.60(18.00)**
Union Density	32.96(47.30)	-8.01(52.39)
Left Party strength	1.39(2.79)	0.43(2.77)
GDP per capita (In Thousands)	-74.15(63.01)	-58.47(55.04)
Male employment rate (Percent)	163.10(60.67)*	137.20(52.83)*
Service Employment Share (Reference=Manufacturing)	241.76(95.27)*	157.44(101.02)
Agricultural Employment Share (Reference=Manufacturing)	-386.83(161.77)*	-424.58(125.71)**
Urban	17.08(85.30)	
Percent <15 years old (Reference =Percent 15-64)	86.14(139.64)	54.54(121.35)
Percent age 65 and over (Reference=Percent 15-64)	-427.06(114.52)**	-318.90(117.58)*
1980s (Reference=1970s)	226.95(474.90)	454.45(551.84)
1990s (Reference=1970s)	232.04(535.58)	504.18(542.26)
2000s (Reference=1970s)	332.57(638.65)	512.98(697.67)
Constant	-15415.10(6745.64)*	-9782.95(5124.92)+
Fixed Effects	Yes	Yes
Number of Observations	112	112

Note: Robust standard errors in parentheses clustered at the country level. The interactions are centered at mean values. +$P<0.10$, *$P<0.05$, **$P<0.01$ (two-tailed tests)

Appendix E

Regression Model With Interaction Between Male Employment and Incarceration

	Model 1
Incarceration Rate (Logged)	1.00(0.85)
Welfare Generosity	-0.12(0.07)+
Female Employment Rate (Percent)	-0.19(0.08)*
Male employment rate (Percent)	-0.20(0.36)
Welfare Generosity*Incarceration	-0.21(0.08)*
Female Employment*Incarceration	-0.16(0.05)
Male Employment*Incarceration	0.08(0.07)
Union Density	-0.05(0.06)
Left Party strength	-0.00(0.00)
GDP per capita (In Thousands)	0.22(0.06)**
Service Employment Share (Reference=Manufacturing)	-0.00(0.18)
Agricultural Employment Share (Reference=Manufacturing)	0.40(0.29)
Urban	-0.13(0.14)
Percent <15 years old (Reference =Percent 15-64)	-0.04(0.14)
Percent age 65 and over (Reference=Percent 15-64)	0.37(0.17)*
1980s (Reference=1970s)	1.32(0.70)+
1990s (Reference=1970s)	2.13(1.03)+
2000s (Reference=1970s)	1.36(1.33)
Constant	36.22(25.11)
Fixed Effects	Yes
Number of Observations	126

Note: Robust standard errors in parentheses clustered at the country level. The interactions are centered at mean values. +P<0.10, *P<0.05, **P<0.01 (two-tailed tests)