

Imprisonment and Opportunity Structures: A Bayesian Hierarchical Analysis*

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Comparative sociologists mostly ignore wide differences in criminality and incarceration rates among modern western societies; with notable exceptions, students of the prison take scant notice of research comparing political economies, welfare regimes, and patterns of inequality. This article outlines an opportunity structures model of imprisonment that bridges this gap by treating incarceration trends as byproducts of the institutional organization of opportunities over the life course. Using a sample of 15 rich democracies observed over four decades, empirical attention focuses on three levels of analysis: the capacities of alternative life course paths, the distribution of political power, and institutional differences in state structures and policy regimes. Hypothesized cross-level interactions call for the specification of a hierarchical model to be estimated within a Bayesian framework. Results conform to the expectations of the opportunity structures model and support many of its specific predictions.

Introduction

Law making and law enforcement are central functions of the modern nation state, and the wide variation in crime rates and levels of incarceration among industrialized democracies presents an attractive set of puzzles for comparative analysis. But these issues are largely ignored in the literatures on comparative politics, socio-economics, and social policy. The focus of this article is on incarceration, and while the number of cross-national analyses in this area is growing, further development requires scholars to overcome two significant challenges. The first is the theoretically promiscuous quality of the imprisonment literature. Recent accounts have drawn links between punishment practices and social welfare regimes (Garland, 1985), structures of domination

and the production of criminological knowledge (Savelsberg, 1994), patterns of inequality (Jacobs and Kleban, 2003; Sutton, 2004; Western, 2006), cultural transformations (Foucault, 1979; Garland, 1992, 2001), the global diffusion of neoliberal ideology (Wacquant, 2001, 2009), and partisan politics (Sutton, 1987, 2000; Jacobs and Helms, 1996; von Hofer, 2003). The task now is to pull these strands together into a coherent theoretical and empirical account.

A second challenge to comparative research, particularly involving quantitative data, is the difficulty of comparing punishment practices across nation states. Research on welfare, education, labour markets, and macroeconomics benefits from the rough isomorphism in institutional forms in these domains, and the fact that, thanks to the homogenizing influence of IGOs like UNESCO, the ILO, the OECD, and the World

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Bank, data are reported in consistent ways across the developed democracies. In contrast, comparability across modern systems of criminal law is problematic because of their disparate and remote historical origins, the tendency of national legal institutions towards self-referentiality and inertia, the lack of internationally valid conventions for recording data, and wide cross-national variation in the structure of institutional fields assigned jurisdiction over criminal behaviour. This is not just a measurement problem. The more fundamental issue is that causal processes determining forms and rates of incarceration may vary in different institutional contexts. Given this possibility, it is reasonable to ask whether any single model can reasonably be applied across a range of societies.

This article attempts to meet both challenges. First, in a bid for theoretical synthesis, I outline and test an opportunity structures model that aims on the one hand to weave together strands from the new research on penalty, and on the other to integrate the analysis of imprisonment with recent macrosociological research on mobility regimes, life-course institutions, and social policy. A preliminary version of the opportunity structures model was described in an earlier study of five Common Law democracies (Sutton, 2000); the version presented here is considerably more detailed. The orienting assumptions of this approach are that criminality is an achieved status, not a particular form of behaviour; and that criminal punishment is one among many institutionalized means of sorting individuals into socially meaningful categories and instilling categorically appropriate identities. My argument, in brief, is that criminal punishment is a form of negative social mobility, and that punishment trends are a byproduct of the social organization of the life course and the resulting distribution of life-course opportunities.

Second, this emphasis on context suggests an analytical strategy that not only acknowledges cross-national causal heterogeneity, but also seeks to take advantage of it. I argue that social policies in different countries—including penal regimes—are influenced by historically rooted and relatively stable institutional structures that vary widely among the developed democracies. In making this argument, I borrow freely from the comparative welfare state literature, which has demonstrated that institutional differences in state structures (Evans, Rueschemeyer and Skocpol, 1985) and policy regimes (Esping-Andersen, 1990, 1999) are fateful for social policies and their outcomes. I emphasize neocorporatism and political centralization as key factors that shape the exercise of political power and ultimately the regulation of the life course.

To forecast my argument, democracies with tightly regulated labour markets and bureaucratically powerful national states are more assertive in regulating the distribution of life-course opportunities, with consequences for penal policy directly, and for the political opportunities available to non-state interest groups seeking to influence social policy. An adequate test of this argument requires both a broader range of data and a more sophisticated modelling strategy than was used in the earlier five-country study. This study uses data from 15 rich democracies observed over 40 years to capture wide variation in institutional regimes, and a multilevel modelling approach that can analyse complex interactions between relatively stable institutional structures and more fluid dimensions of the opportunity space within each country, and the consequences of both for incarceration rates. I motivate hypotheses and describe my modelling strategy in more detail in the sections that follow.

Background and Hypotheses

The opportunity structures model of punishment rests on four basic sociological insights:

1. The moral order arises from a primarily cognitive process of social classification (Durkheim and Mauss, 1963; Douglas, 1970). This process is shaped by institutions that provide naturalized schemas used by official actors to sort people into various developmental pathways, track their progress, and certify their achievement of appropriate institutionalized identities.
2. The sifting of criminals from non-criminals is a special case of this generic sorting process. The production of official criminality is, as Durkheim (1933) recognized, fundamental to the moral ordering of society, but it is not an analytically unique process. Incarceration is a punctuating event in the life course that confers a new and fateful identity. The identity of 'criminal' implies a status that is less reputable than, but otherwise not qualitatively different from, the status of welfare recipient, homeless person, factory worker, or college graduate. Thus, borrowing from Wilkins (1991) and Wilkins and Pease (1987), incarceration is a 'negative reward' that is allocated in the same ways as positive rewards like income, educational and occupational credentials, and health care.
3. Just as criminality is a particular achieved status, criminal justice agencies form a special case of a

much broader array of institutional fields that manage individuals' movement through the life course (Pettit and Western, 2004; Western, 2006). Since crime and incarceration primarily involve young males, attention focuses on institutions that govern the transition from youth to adulthood—especially labour markets, schools, the military, and social welfare. Modern societies vary widely in the arrangements they make for this crucial transition, and these differences are consequential for the production of particular reputable or disreputable selves (Meyer, 1988; Mayer, 1997; Breen and Buchmann, 2002).

4. Given finite resources, institutional fields must compete for jurisdiction over the life course, and the dynamic equilibrium among fields determines societal capacities for producing different kinds of selves. The breadth of any particular life-course path depends on the allocation of resources, which in turn is influenced by higher order cultural and political dynamics. For example, the production of sociology PhDs is dependent on the encouragement of deans, the financial health of universities, the legitimacy of the discipline, and the politics of higher education, among other things. This implies that, net of the supply-side effects of actual criminal behaviour, incarceration rates should be powerfully influenced by demand-side factors—what Wilkins and Pease (1987) have called 'public demand for punishment.'

Building on this foundation, the model focuses empirical attention on three levels of social organization: on life course patterns, which indicate the flows of persons along alternative developmental pathways and opportunities for mobility; on the distribution of political power, which influences how life course opportunities are apportioned; and on institutional structures that determine the state's capacity for robust social policymaking.

The Organization of the Life-course and Inequality

A life course perspective implies that opportunities for incarceration will vary inversely with opportunities for other, more legitimate, outcomes. Attention here focuses on opportunities available to young males, who commit a disproportionate share of personal and property crimes (Hirschi and Gottfredson, 1983; Cohen and Land, 1987; Gartner and Parker, 1990;

Pampel and Gartner, 1995), and who therefore make up a preponderant share of prison inmates (Berk *et al.*, 1983). It is consistent with the literature to assume that young men in modern societies face a limited set of broad life-course alternatives: if they are not in prison, they are likely to be in school, at work, or in the military. The implication at the aggregate level is that as opportunities for legitimate attachments expand, rates of crime and incarceration will tend to decline. The first hypothesis deals with the pressure placed on the life-course system as successive male cohorts approach adulthood:

H1: The greater the proportion of young males in the population, the higher the rate of imprisonment.

Three more hypotheses predict negative associations between rates of legitimate life-course transitions and rates of incarceration:

H2: Higher unemployment rates lead to higher rates of imprisonment.

H3: Expansion in school enrolments reduces the rate of prison growth.

H4: Expansion in military enlistments lowers imprisonment rates.

The analysis of life-course patterns is supplemented with two hypotheses concerning aggregate economic opportunity. First, the effects of limited opportunity may be offset by countercyclical spending on social welfare. The close historical association between prisons and welfare, at least in the Anglo-American world, has been established by Garland (1985) and Sutton (1987, 1988). Wacquant (2009) has updated this idea by arguing that the diffusion of American-style neoliberalism—involving, among other things, more stringent restrictions on aid to the poor and unemployed—has driven the growth of prisons in many countries since the 1970s. This argument is corroborated by quantitative research on the Common Law countries (Sutton, 2000). I predict that, across the countries in the present sample, incarceration rates are inversely associated with welfare spending. Second, I predict a negative association between incarceration and inflation. This may be counterintuitive, since inflation makes people in general poorer by eroding the value of money (hence wages). In fact, however, inflation tends to reduce inequality by shifting wealth from creditors to debtors (Dornbusch, Startz and Fischer, 1998, pp. 518–521; Dimelis and Livada, 1999;

Johnson and Shipp, 1999). Conversely, *disinflation* has profound adverse consequences that hit hardest on low-income persons. This occurred, for example, in the early 1980s, when the USA and other rich countries adopted tight-money policies that brought on a deep recession. One recent study (Sutton, 2004) found a negative effect of inflation on imprisonment that was stronger and more robust than that of unemployment or economic growth. Thus:

H5: Higher welfare spending lowers imprisonment rates.

H6: Higher inflation reduces imprisonment rates.

Political Power

Life-course outcomes are proximally related to incarceration rates, but they are not exogenous. They are themselves the products of institutional arrangements that prescribe the normative sequence of life events, establish links among nodes in the sequence, and define criteria for successful transitions from one life stage to another. Western democracies vary widely in the opportunities available for individuals to pursue alternative pathways (Mayer, 1997; Breen and Buchmann, 2002) because of differences in the capacities of states to regulate the life course and manage inequality (Mayer and Schoepflin, 1989). Relevant empirical work has focused on the determinants of welfare effort and labour market performance, but it is reasonable to extend the same logic to the analysis of imprisonment. This analysis focuses on two sources of variability in the distribution of power. First, strong unions enhance the collective power of workers to influence wage-setting and conditions of work, but also other policies that are friendly to workers and their families. For example, stronger union sectors are associated with higher levels of redistributive social spending (Boreham, Hall and Leet, 1996) and lower levels of inequality (Garrett, 1998). More recent work suggests that strong unions drive down imprisonment rates as well (Sutton, 2004), presumably as a byproduct of organized labour's preference for redistributive policies over punitive ones.

A second and related factor is partisan politics. Comparative research shows that left parties encourage more redistributive social policies (Korpi, 1989; Hicks and Swank, 1992; Hicks and Misra, 1993; Garrett, 1998), tighter regulation of labour markets (Garrett, 1998; Hicks, 1988), and a preference for inflation over

unemployment (Hibbs, 1997), so there is good reason to suspect that they exert an antecedent influence on factors that are likely to affect imprisonment rates. There may be direct effects as well: comparative research has shown that dominance by right parties tends to drive imprisonment rates up, at least among the Anglo-American democracies (Sutton, 1987, 2000; Jacobs and Helms, 1996); there is also good reason to expect negative effects of left-party dominance across a broader range of countries (Sutton, 2004). This discussion yields two hypotheses:

H8: Stronger union movements are associated with lower imprisonment rates.

H9: Imprisonment rates are lower when left parties are in power than when parties of the right and centre are in power.

Institutional Foundations of Political Domination

Politics is a contest, and the distribution of power is fluid. But political contests occur in relatively stable institutional contexts that define the rules of the game, and these rules vary considerably, even among advanced democratic societies. In the social policy arena the key issue is political closure: Who has access to centres of authority? To what degree are these centres insulated from local and particularistic interests? The expectation is that where decision-making is monopolized by bureaucratic élites, the result is more universalistic, and therefore less punitive, social policies. Conversely, porous institutional structures are vulnerable to particularist groups that are inclined to frame issues in zero-sum terms; in these settings policy debates are easily politicized, leading to more invidious social policy in general and harsher responses to crime in particular (Christie, 1994; Savelsberg, 1994; Garland, 2001).

One way modern states achieve closure is through neocorporatist labour market regulation. In corporatist regimes, wage rates, work rules, and policies concerning employment security and social protection are set by negotiations among 'peak associations' comprising union federations, industry associations, and the state. In liberal democracies like the USA and the UK, social policy is deferential to the market; interest groups are powerful, but they play no formal role in social policymaking. More than just labour market policies, corporatism and neoliberalism are alternative institutional logics—one emphasizing cooperation and the

other competition—that shape social policy across a wide range of domains (Hicks and Kenworthy, 2003). Research shows that corporatism encourages higher spending on social welfare (Hicks and Swank, 1992; Hicks and Misra, 1993), and it is likely to have implications for imprisonment as well, since penal policy has historically been tied to the fate of liberal ideology (Bentham, [1789]1996; Foucault, 1979). Classical penology and liberalism were eclipsed in the mid-20th century by the rise of the Keynesian welfare state and rehabilitative penal ideology, but, as Garland (2001) and Wacquant (2009) have argued, market liberalism has roared back in the USA and the UK, this time tied to a neoconservative moral agenda and a punitive approach to crime. But corporatist institutions remain strong in many democratic societies (Garrett, 1998), and previous research suggests that they may act as a breakwater against the punitive tide (Greenberg, 1999; Jacobs and Kleban, 2003; Sutton, 2004). Thus:

H10: Imprisonment rates are lower in countries with neocorporatist bargaining regimes.

Political closure is also more likely where national governments monopolize political authority, and there are a number of reasons to think that state centralization is fateful for incarceration trends.¹ Centralized bureaucratic states are inclined to generate universalistic policies in response to problems of public welfare, and they are aided in doing so by their superior revenue-generating abilities and capacity to monopolize functional and administrative expertise. Centralization encourages ‘wholesale’ politics in which political parties and labour unions are nationally organized and cohesive, and compete for power in broad ideological terms. In contrast, politics in decentralized states is retail: the definition of public welfare is a zero-sum game in which competition is driven by demands for patronage and influence by local and single-issue constituencies. Thus social policies in centralized states tend to be more universalistic and redistributive than those in decentralized states (Orloff and Skocpol, 1984; Weir and Skocpol, 1989; Hicks and Swank, 1992; Hicks and Misra, 1993; Huber, Ragin and Stephen, 1993). It is easy to extend this argument to the case of imprisonment, perhaps the ultimate anti-distributive social policy. As Christie (1994) and Savelsberg (1994) have argued, criminal justice policy in decentralized democracies is likely to be made in the media and at the ballot box, and in more centralized democracies in under-the-radar consultations among legislators,

bureaucrats, and academic experts. The result for the former is more punitive policies:

H11: Mean imprisonment rates are lower in centralized states than in federal states.

The hypotheses so far suggest that the effects of political power and institutional structure are convergent and additive. I argue further that causal processes at the two levels interact with each other: specifically, that the influence of unions and left parties is contingent on levels of corporatism and polity centralization. Research and theory suggest two possible kinds of contingencies. First, neocorporatist bargaining arrangements and polity centralization may amplify the impacts of labour unions and left parties by buffering social policy negotiations from local influences and encouraging national-level mobilization. In contrast, neoliberal economic institutions and federalized polities encourage fissiparous politics that would likely weaken the influence of national interest groups by forcing them to accommodate diverse local constituencies. But this scenario may go too far in treating the state only as what Hicks and Swank (1992) call an ‘infreresource’ for interest groups in civil society, rather than as a collective actor with interests of its own. An alternative scenario is suggested by Weber’s (1978, pp. 212–226, 956–1005) discussion of the modern bureaucratic state. Both neocorporatism and polity centralization imply a state with robust and comprehensive bureaucratic authority. The specific strength of bureaucratic administration is that it is ‘domination through knowledge’ (1978, p. 225)—indeed, as Savelsberg (1994) argues, bureaucracies have the authority to define what is canonical knowledge. Strong bureaucracies crowd out partisan influence because, to the degree that the bureaucrat is an expert, the politician is a dilettante. From this perspective, centralized bureaucratic administration will buffer the impact of short-term changes in union strength and partisan alignments. In formal terms, this suggests a negative interaction: neocorporatist bargaining arrangements and polity centralization will tend to weaken the marginal influence of non-state political actors.

Sample and Data

The data for this study comprise time-series for 15 large, wealthy democracies observed from 1960 to 2000. The sample includes five Anglo-American liberal democracies (Australia, Canada, New Zealand, the

UK, and the USA), four Scandinavian social democracies (Denmark, Finland, Norway, and Sweden), and six conservative corporatist democracies (Austria, Belgium, France, Germany, and the Netherlands).

The dependent variable is imprisonment rates, measured as a ratio of the number of inmates per 100,000 population. This measure combines inmates who are remanded pending trial and those who are serving sentences. Given ideal data, we might prefer to distinguish between these groups; there are two justifications for the aggregate measure used here. The first is data availability: separate counts of remand populations are not available at all for Canada, and are only partial for two other countries. Second, even if the data could be gathered, the distinction between sentenced and remand populations would be meaningless, and probably fatally biased, because of differences in national legal conventions. Unlike Common Law systems, continental European countries count convicted prisoners as being on remand until all of their appeals are exhausted, making cross-national distinctions between sentenced and remand populations impossible (Pease, 1994).² Wilkins (1991), whose ‘market model’ of imprisonment informs my own approach, uncomplicates the issue nicely: ‘The incarceration rate represents the proportion of individuals who have lost their liberty by reason of the deployment of the criminal law. The incarceration rate is an excellent proxy for many other measures of societies’ responses to acts defined as crimes; moreover it is generally available, simple, and highly variable’ (Wilkins and Pease, 1987, p. 20).

Independent variables are measured in standard ways and come from standard international sources, country yearbooks, and specialized data sets.³ Taking first the life-course indicators, the relative size of the young male population is calculated as the number of males age 15–24 years as a percentage of the population; unemployment is the percentage of the labour force that is unemployed; the male school enrolment rate is the number of males enrolled in secondary and tertiary education as a percentage of males age 15–24 years; and military enlistments are measured as the number of persons in active military service as a percentage of the population. The indicator of welfare effort is total spending on social benefits as a percentage of GDP. Inflation is calculated as the proportional annual change in within-country GDP deflators. Union strength is measured in terms of union density, the number of members as a percentage of the active labour force; and left-party dominance is the proportion of cabinet seats held by social democratic and labour parties in each year. The indicator of

neocorporatism used here is taken from a composite measure compiled by Hicks and Kenworthy (2002). In its original form, this is a time-varying measure; I treat it as time-invariant by taking country means. This entails an inconsequential loss of sensitivity, since with the present sample 97 per cent of the variance is cross-national. As an indicator of state centralization, I use the factor scale derived by Hicks and Swank (1992). This is a synthetic measure that combines revenue centralization, unitary rather than federal government, and early consolidation of key social welfare policies. A scatterplot showing country scores on neocorporatism and state centralization appears in Figure 1, with lines in the graph showing means on each axis. Clearly these are independent measures ($r = -0.20$), and the present sample captures a good range of high and low values on both axes.

Two additional variables complete the model. I use homicide rates, measured as the number of homicides per 100,000 population, to control for the effect of crime on imprisonment. Homicide is a far from perfect indicator of crime in general, but there are no better alternatives. The virtues of homicide data are that they are reliably recorded (Monkkonen, 1989), and because of their conspicuousness they are likely to have an exaggerated influence on public perceptions of crime and thus on crime-control policies (Zimring and Hawkins, 1997). A second issue to be dealt with is race and interracial conflict. The ‘racial threat’ hypothesis—which originated with Blalock (1967) and was developed in a somewhat different direction by Blau and Blau (1982)—holds that the larger the minority population, the greater is the potential for conflict in the form of violent crime and legal repression. It has

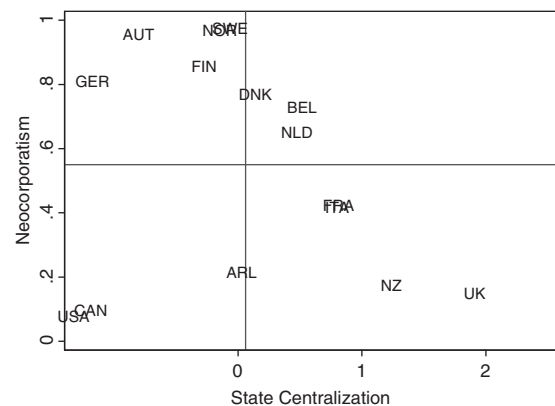


Figure 1 Countries in the sample by neocorporatism and state centralization.

received support from several studies, mostly using local-level data from the USA, and more recently Jacobs and Kleban's (2003) analysis of cross-national data showed minority threat effects on incarceration trends. It is reasonable to suspect that if minority presence influences criminal punishment, it is also likely to affect other aspects of the opportunity structure that are of interest here, especially employment, access to education, and the extent of welfare support. If so, models that exclude it may yield spurious results. There are two caveats to keep in mind, however. First, the best available indicator of minority presence, from the Minorities at Risk data (2005), varies across countries but is constant over time for the countries in this sample; thus it is insensitive to changes due to differential fertility and patterns of migration. Second, this indicator is highly (inversely) correlated with the measure of neocorporatism ($r = -0.82$), requiring separate models to gauge their effects, and raising interesting problems of interpretation.

Some variables include missing observations, and missing data are dealt with in different ways. A very small number of missing values on the dependent variable are filled in with linear interpolation, as are occasionally missing counts of male secondary and tertiary students. Counts of young males in the population are available only at 5- or 10-year census intervals, depending on the country; estimates for intervening years are interpolated as well. More serious problems arise with welfare spending, which is missing for Austria prior to 1970, and union density, which is missing for New Zealand prior to 1978. For these observations, I impute values as part of the estimation routine. This strategy is described more fully below.

Model Specification and Estimation

Regression analysis of data from a sample of countries observed over time requires attention to the problem of non-homogeneity, the biasing effect of stable but unmeasured differences between countries. Conventional fixed- and random-effects estimators correct for non-homogeneity by allowing either the intercept or the error term to vary cross-sectionally (Greene, 1997; Halaby, 2004). Both approaches treat heterogeneity as a nuisance to be swept out of the model. Thus they beg the question of why the intercept or the error varies, and they ignore the issue of causal heterogeneity—that is, variability in the effects coefficients—entirely. Following Western (1998, 1999) and Beck and Katz

(2007), I use the hierarchical model (HM) as a means to rescue information that FE and RE models throw away. The HM estimates causal heterogeneity explicitly by partitioning the variance into two (or more) levels: the micro level comprises individual observations (in this case, annual observations of countries), and the macro level comprises the contexts in which those observations occur (in this case, countries that vary on neocorporatism, state centralization, and minority populations). The micro-level model used in this analysis can be written as:

$$y_{jt} = \beta_{jk} \mathbf{x}'_{jkt} + \varepsilon_{jt},$$

where y is the incarceration rate in country j at year t , β_{jk} is a matrix of coefficients for variable k in country j , \mathbf{x} is a matrix of predictors with ones in the first column but otherwise varying over time and space, and ε is a matrix of random disturbances. The feature that distinguishes the HM from standard time series cross-section estimators is that the β_{jk} —the intercept and the effects estimates—are allowed to vary cross-sectionally, opening up the opportunity to model them as outcomes. I model the intercept and the coefficients for union density and left party strength with two country-level predictors:

$$\hat{\beta}_k = \gamma_{k0} + \gamma_{k1}z_1 + \gamma_{k2}z_2 + \eta_k, \text{ for } k = 0, 1, 2.$$

In the macro-model for the intercept, z_1 is either neocorporatism or minority population share, and z_2 is state centralization; the models for union density and left party strength include corporatism and centralization only. Other effects are treated as random, with no systematic macro-level influence:

$$\hat{\beta}_k = \gamma_k + \eta_k, \text{ for } k = 3, \dots, 9.$$

The model is estimated within a Bayesian framework, for several reasons. Classical methods assume that data are generated by a repeatable mechanism with a known probability process (Western and Jackman, 1994; Berk, Western and Weiss, 1995). This is inappropriate in this case because the present sample of countries is not random, and the post-World War II period is not likely to recur; standard test statistics such as confidence intervals are therefore meaningless. Bayesian methods assume that the coefficients—not the data—are drawn from a shared distribution, and yield probabilistic inferences about their true values (Western, 1999). Further, because complex HMs require estimation of numerous coefficients—in this analysis, 125 β -coefficients and 16 γ -hyperparameters, plus country and parameter variances—they can easily overwhelm small data sets (Seltzer, Wong and Bryk, 1996). In a

Bayesian framework, it is the coefficients, not the data, which are sampled. Modern Bayesian methods use Markov chain Monte Carlo (MCMC) simulation, usually implemented using the Gibbs sampler, to draw parameter estimates randomly from some more-or-less restrictively defined parameter space, compare it to the observed data, then update the estimates (Seltzer, Wong and Bryk, 1996; Western, 1998; Gelman and Hill, 2007, ch. 18). These iterations can be repeated as many times as necessary to allow the sampler to explore the parameter space and converge on a stable set of estimates. Finally, classical methods applied to multilevel models may underestimate parameter variances. Bayesian estimates are more conservative because they explicitly incorporate prior uncertainty about the distribution of the hyperparameters (Western, 1999, p. 23).

Estimation requires clear statements of distributional assumptions. At the micro level, I assume that y_{jt} is normally distributed with heteroskedastic variance σ_j^2 , and that it is linearly dependent on a set of predictors X_{jt} :

$$y_{jt} \sim N(\hat{y}_{jt}, \sigma_j^2),$$

$$\hat{y}_{jt} = \mathbf{x}'_{jt} \boldsymbol{\beta}_j.$$

In the macro model, the micro-level β coefficients are normally distributed across countries:

$$\beta_j \sim N(\hat{\beta}_j, \tau^2).$$

The γ -coefficients are normally distributed with zero means and large variances: $\gamma \sim N(0, 1000)$. These 'skeptical priors' (Weiss *et al.*, 1999), so-called because they tug against the data to yield conservative estimates. The country-level variances σ_j^2 and the coefficient variances τ^2 are given uniform distributions with a generous range (0,50): $\sigma_j^2 \sim U(0,50)$, $\tau^2 \sim U(0,50)$. Covariates were centred at their grand means and divided by two standard deviations. This form of centering has several advantages: it aids convergence by lowering correlations among the β_j ; the posterior estimate of γ_{00} , the mean of the cross-sectional intercepts, can be interpreted as the estimate of the adjusted mean (log) imprisonment rate; and effects estimates can be read conveniently as the percentage change in incarceration rates associated with a 2 SD shift in the independent variable.⁴

Bayesian estimation offers a convenient method for imputing missing values for welfare spending and union density (Gelman and Hill, 2007, ch. 25). The only necessary assumption is that the data are missing at random. Randomness here has the very specific interpretation that observations are missing for reasons

that are unrelated to the variable's value—or more concretely, for example, that the OECD did not neglect to record welfare spending in Austria for some years because spending was especially high or low. Based on this assumption, fully Bayesian imputation proceeds by specifying a distribution based on non-missing values, contingent on other variables from the model of interest. In this case, preliminary analysis showed that welfare spending is reasonably well estimated by per cent young males, unemployment rates, school enrolments, and left party dominance; and union density by young males, inflation, left party dominance, and homicide rates (note that the goal is not causal inference, but accurate prediction). Likelihoods for welfare spending, union density, and incarceration rates are then estimated jointly and iteratively.

Results

Summaries of the posterior distributions from two models of imprisonment rates appear in Table 1. Model 1 includes neocorporatism in the macro-equation for the intercept, and Model 2 substitutes the minority population share. For each model, the table shows the means of the posterior distributions and the proportion of the posterior that falls above or below zero. This proportion is a precise estimate of how much confidence is warranted in a true, i.e. non-zero, association.

First compare the models for the intercept. The mean intercepts are of course almost identical, showing that the adjusted mean incarceration rate overall is $e^{4.23} \simeq 68.7$ per 100,000 population. Model 1 shows, as expected, a negative impact of neocorporatism: for countries that are 2 SDs above the mean on the neocorporatism measure, predicted incarceration rates are $\simeq 10$ per cent below average, or $e^{4.23-0.105} \simeq 61.9$. In Model 2, the mean estimate for minority population share is positive, also as expected. For countries that are 2 SDs above the mean, incarceration rates are predicted to rise by $\simeq 12$ per cent, to $e^{4.23+0.12} \simeq 77.3$. These estimates warrant only moderately low certainty—below 70 per cent in both cases. State centralization shows the anticipated negative effect in both models, with fairly strong certainty.

Remaining results are almost identical across models. Observed mean effects of the political influence variables (γ_{10} and γ_{20}) are consistent with the respective hypotheses, and the associations are credible: countries with stronger labour movements and stronger left parties experience lower rates of imprisonment. However these effects differ in strength and in how

Table 1 Hierarchical model results: Bayesian estimates of the effects of selected variables on imprisonment rates

		Model 1		Model 2	
		Mean	$p \gamma > 0$	Mean	$p \gamma > 0$
γ_{00}	Intercept	4.226	1.000	4.227	1.000
γ_{01}	Neocorporatism	-0.105	0.670		
	Minority population share			0.118	0.690
γ_{02}	State centralization	-0.192	0.780	-0.183	0.780
γ_{10}	Union density	-0.372	0.980	-0.376	0.980
γ_{11}	Neocorporatism	0.696	0.960	0.669	0.950
γ_{12}	State centralization	0.426	0.870	0.396	0.850
γ_{20}	Left party cabinet share	-0.008	0.730	-0.007	0.720
γ_{21}	Neocorporatism	-0.047	0.940	-0.051	0.940
γ_{22}	State centralization	-0.005	0.530	-0.010	0.590
γ_3	Per cent young males	-0.081	0.900	-0.082	0.920
γ_4	Unemployment rate	0.121	0.990	0.119	1.000
γ_5	Male 2 ^o and 3 ^o enrolment rate	0.011	0.570	0.013	0.600
γ_6	Military enlistments	-0.143	0.980	-0.148	0.980
γ_7	Welfare effort	-0.065	0.930	-0.063	0.890
γ_8	Inflation	-0.026	0.940	-0.026	0.940
γ_9	Homicide rate	0.024	0.600	0.029	0.610

they interact with fixed institutional factors. The impact of union density is substantial. In Sweden, for example, union membership peaked at ≈ 87 per cent of the workforce in 1993 and 1994, or 2.28 SDs above the mean; this corresponds to a predicted drop of 35 per cent in incarceration rates. In contrast, France's union density in 2000 was 8.3 per cent, the lowest in the sample; the prediction here is incarceration rates 44 per cent higher than the norm.⁵ The negative effect of left party cabinet share is substantively weaker. In countries and years where left parties hold 100 per cent of cabinet seats—say, Denmark in 1978—the predicted impact on incarceration is about -0.07 per cent.

The models yield interesting results concerning the interactions of political power with institutional structures. Recall that hypotheses in this regard are two-sided: one scenario predicts that the effects of union and left party strength will be *amplified* when structural arrangements encourage political closure; the other predicts that political closure will *reduce* the influence of interest groups by strengthening the national state's bureaucratic authority over social policy. Results regarding the union density effect emphatically support the second scenario. The distributions of the neocorporatism and centralization parameters γ_{11} and γ_{12} lean strongly positive, counteracting the negative influence of union strength. Contingencies involving left party dominance are quite

different. The posterior mean for neocorporatism (γ_{21}) is negative, indicating that left party effects are amplified in countries with highly regulated labour markets. The posterior mean for state centralization (γ_{22}) lies close to zero, indicating no effect. These findings leave a bit of a puzzle. It is reasonable to find that unions, which are nonstate actors, are crowded out by the concentration and centralization of political authority, and that left parties, as direct auxiliaries of the state, become more potent under the same conditions. But it is surprising that left party influence is independent of polity centralization.

Estimates for life-course effects are mostly as anticipated, but the models contain a few surprises. One surprise is the unequivocally negative impact of young male populations. Furthermore male school enrolments and homicide rates appear unrelated to incarceration rates. Effects of unemployment rates are positive, showing as expected that incarceration grows in recessionary economies. Confidence in this association is 99–100 per cent. Evidence is also strong that higher rates of military enlistment discourage incarceration: when enlistment rates are 2 SDs above the mean, incarceration rates are reduced on average by ≈ 14 per cent. Welfare effort and inflation have negative impacts, and while these effects may be substantively small they are between 89 and 94 per cent certain.

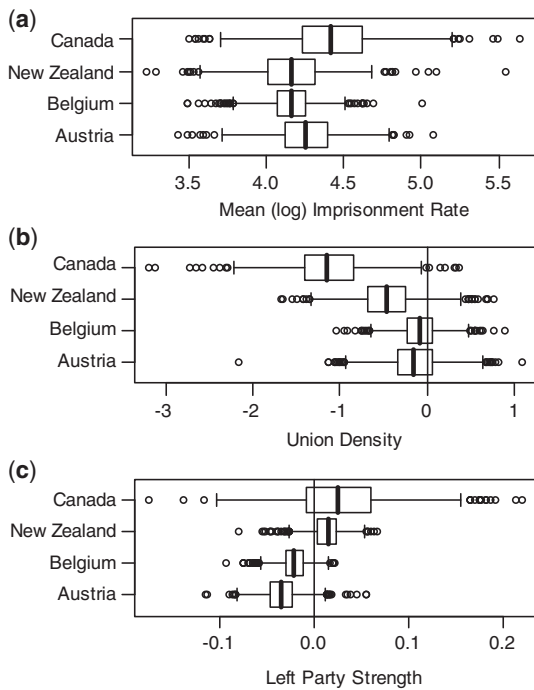


Figure 2 Predicted mean imprisonment rates (a) and effects of union density (b) and left party strength (c) for four countries, conditional on neocorporatism and state centralization.

We can use the posterior summaries to draw out the substantive implications of the macro-level effects. Drawing on Model 1 in Table 1, thus setting aside for the moment the possible influence of minority populations, Figure 2 shows predicted mean (log) rates of imprisonment (country intercepts) and effects of union density and left party strength for four countries. These countries are chosen to represent the quadrants in Figure 1: in Belgium, labour market regulation and state centralization are both above their means; New Zealand has unregulated labour markets and a highly centralized polity; Austria scores high on neocorporatism, but has a federalized polity; and Canada is low on both dimensions. The first panel shows that both macro-variables influence country means to some degree, but the impact of polity centralization dominates: net of other measured covariates, countries in the low/low quadrant (Canada) have the highest predicted rates of incarceration, and those in the low/high quadrant (New Zealand) or the high/high quadrant (Belgium) yield notably lower predicted rates. The second panel shows that the union density effect is contingent primarily on neocorporatism. The strongest

negative effects of union membership are found in New Zealand and Canada, which share very weakly regulated labour markets but have widely differing polities. The predicted effects for Belgium and Austria are nil. Effects of left party strength, shown in the third panel, are clearly contingent on neocorporatism. A negative effect appears both powerful and credible in Austria and Belgium, the more corporatist countries; the plot suggests net positive effects in most liberal market economies, but that is hard to credit. Referring back to Figure 1, a safer conclusion is that left party dominance inhibits incarceration everywhere but in the Anglo-American democracies.

Sensitivity Analyses

In further tests, I explored the sensitivity of these results to distributional assumptions and alternative measures.⁶ In one such test, I estimated a model that is otherwise identical to Model 1 in Table 1, but under the prior expectation that the β_j are Student's t distributed, $\beta_j \sim t(\hat{\beta}_j, \tau^2, 5)$. Compared to the normal model, the model using the fatter-tailed t distribution may yield more robust estimates by downweighting the contribution of countries with extreme parameter values (Seltzer, Wong and Bryk, 1996). This respecification made no difference in the results. In a cruder attempt to address the same issue, I omitted all observations from the USA, which are most likely to have idiosyncratic influences. Again, results were consistent with those reported above.

Other models tested additional hypotheses that have been of interest in previous cross-national research. One set of tests attempted to push farther on the minority conflict argument by using two indicators of political discrimination against minority groups, one from the Minorities at Risk data and the other from Wimmer and Minn (2006).⁷ These measures are arguably more germane than the simple measure of minority population size, and because they are time-varying they are also more sensitive. Both show clear associations with incarceration rates, but the associations are negative, suggesting that higher degrees of minority oppression yield lower levels of imprisonment. This is surely not a causal association; more likely it is an artefact of coincidental time trends: formal political discrimination declined in the latter half of the 20th century (Asal and Pate, 2005), even as incarceration rates rose in several countries in the sample. In any event, these findings cast doubt on whether the minority population variable used here is a valid indicator of intergroup conflict. A final test involved partisan political effects. Some analyses of

welfare spending suggest that centre parties—particularly Christian Democratic parties that are prominent in European countries with substantial Catholic populations—may play an important ancillary role to left parties in shaping a wide range of social policies (Wilensky, 1981; Esping-Andersen, 1990; Hicks and Swank, 1992; Hicks and Misra, 1993; Huber, Ragin and Stephens, 1993). I tested an indicator of the share of cabinet seats held by Christian Democratic parties (from Swank, 2002), and found no effect on imprisonment rates.

Summary and Discussion

The central theme of the opportunity structures model of imprisonment is that punishment practices are embedded in a wider array of institutional mechanisms that structure the allocation of life-course opportunities in modern societies. More specifically and substantively, I have argued that incarceration, like education and employment, is both a product of inequality and a means by which inequality is reproduced. Incarceration rates will therefore vary in accordance with the breadth and range of legitimate life-course opportunities, and more generally with societal capacities for managing inequality.

Empirical results support most, but not all, of the model's predictions. Of the life-course variables, unemployment and military enlistments show strong effects, supporting the expectation that legitimate and illegitimate opportunities are inversely related. That argument is undercut somewhat by the finding that educational opportunity—arguably the most important source of mobility and legitimate identities—is unrelated to incarceration. The negative effects of welfare spending and inflation give added evidence that prisons are embedded in webs of social and macro-economic policy. Given these demonstrated influences, it is interesting that the two supply-side variables in the model—the size of the young male population and homicide rates—show in one case a counter-hypothetical effect, and in the other no association at all. The negative coefficient estimate for young males can probably be accounted for in terms of within-country demographic trends: with the maturation of the post-WWII baby boom cohort, countries in the sample grew on average older at the same time prison populations were stable or rising. The null effect of homicide rates is not the last nail in the coffin of realist accounts of prison expansion, since it is always possible that better crime data would show different results. Still, to the degree that prison expansion is

fueled by harsher punishment of victimless crimes, particularly drug offenses—as it surely has been in the USA and the Netherlands, two countries where growth has been most conspicuous—we should look to changing policies rather than changing criminal behaviour for an explanation.

Finally, macro-level institutional effects operate in multiple ways. Neocorporatist labour market regulation and political centralization encourage political closure, enhancing the state's ability to balance competing interests and resist populist demands for harsher and more exclusionary social policies. Results yield weak evidence of a negative main effect of neocorporatism, but stronger evidence that more centralized polities incarcerate their citizens at lower rates. Contrary to arguments that see the state primarily as a resource for non-state actors, political closure seems not to amplify the voices of labour unions; on the contrary, it reduces their leverage on social matters by strengthening the state's policy monopoly. Findings are the opposite with regard to left parties: their influence seems to reach critical mass only under some degree of neocorporatist labour-market regulation.

This article began by identifying two challenges to research on incarceration trends in modern societies: the first is to synthesize a diverse array of arguments, many of which speak past each other, into a coherent theoretical account; the second is to apply an analytical model that attends to the profound cross-national differences among polities and criminal justice institutions, but is nonetheless capable of yielding general inferences. My theoretical strategy was to locate criminal punishment in the *n*-dimensional opportunity space through which individuals wend their lives, and to offer hypotheses about how the relative distribution of legitimate and illegitimate opportunities within that space affects rates of punishment. The result is not, except in this application, a model of punishment; it is rather a model of social organization that is animated by quite general ideas about the interplay of demography, institutions, and social policy. Because the model emphasizes the reciprocal interdependence of institutional fields and of the life paths under their jurisdiction, it also implies that criminal punishment is consequential for education and labour markets. If that is so, comparative research on inequality and the life course ignores the prison at its peril.

The analysis conforms to the expectations of the opportunity structures model and supports many of its specific predictions. But important questions remain, and here I will mention two that seem most pressing. First, it is important to ask whether changes in the

global political economy have led to a temporal shift in the causal logic of imprisonment. Many scholars have argued that globalization has undermined Keynesian regimes of economic regulation and social protection (see Garrett, 1998, for a review and critique), and some research finds epochal social policy realignments after the 1973–1974 oil shock (Hicks and Swank, 1992; Hicks and Misra, 1993). Wacquant (2001, 2009) has argued more specifically that, since the 1970s, globalization has encouraged the export of American-style penal policy. These arguments imply shifts in penal regimes—causal heterogeneity operating over time rather than across countries—a problem that can be addressed using Bayesian change point methods (Western and Kleykamp, 2004). A second question is whether the status of subaltern groups—immigrants, native populations, and other racial–ethnic minorities—affects incarceration trends in ways that are not apparent from the rough measures used here. Available evidence suggests that such groups are overrepresented among prison inmates in all Western countries.⁸ Blau's (1994) theory of opportunity structures suggests that majority–minority relations are more likely to lead to conflict—including, perhaps, higher incarceration rates—when outsider status is coincident with high levels of segregation and concentrated disadvantage. Presently available cross-national data do not permit systematic comparative analysis of this issue, but detailed analysis within one or a few countries would likely be fruitful.

Notes

1. The following argument draws from a number of sources in both the pluralist and 'state-centred' traditions. See, in particular, Dahl (1982), Lijphart (1984), Orloff and Skocpol (1984), Skocpol (1989), and Weir and Skocpol (1989).
2. Prison admission rates provide a more sensitive measure than population rates, but are wholly unavailable for five of the countries in the sample and only spottily available for three more.
3. For descriptions and source citations see Appendix Table A1.
4. Models were estimated with the WinBUGS program (Lunn *et al.*, 2000), using the R2WinBUGS interface in R (Sturtz, Ligges and Gelman, 2005). I ran two parallel sequences of simulations for a burn-in of 45,000 samples, followed by an additional 5,000

samples, of which 1,000 were retained for analysis. Convergence was monitored using the \hat{R} -statistic (Gelman *et al.*, 2004, pp. 269–297), and all reported coefficients were at the optimal 1.0 level.

5. These predictions are only illustrative, since they assume that all other variables in the equation are set at their means, which for any particular country they are not.
6. Tables showing unreported results are available from the author.
7. I am grateful to Brian Min for sharing a copy of the Wimmer and Min data with me, and to Victor H. Asal for his advice on using the MAR data.
8. This is based partly on my own reading of published statistics. See Wacquant (1999) for a more systematic discussion.

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Appendix A

Table A1 Variable, descriptions, and sources

Variable	Description	Source
Imprisonment rates	Inmates per 100,000 population	Various (see text)
Per cent young males	Males aged 15–24 years as per cent of total population	United Nations Statistical Office (1948–2006)
Unemployment rates	Unemployed persons as per cent of total working population	OECD (1999, 2001)
Welfare effort	Social expenditure as per cent of GDP	OECD (2004)
Inflation	Proportional change (from $t-1$ to t) in GDP deflator	Heston, Summers and Aten (2006)
Male school enrolments	Males enrolled in secondary and tertiary schools as per cent of male population 15–24	UNESCO (1955–1999), UNESCO Institute for Statistics Data Centre (2009)
Military enlistments	Active-duty military personnel as per cent of total population	Faber (1989), IISS (1983–2001)
Union density	Union members as per cent of total labour force	Visser (2009)
Left party dominance	Proportion of total cabinet seats held by left parties (average from $t-2$ to $t-1$)	Swank (2002)
Neocorporatism	Hicks-Kenworthy wage coordination measure	Hicks and Kenworthy (2002)
State Centralization	Hicks-Swank factor scale	Hicks and Swank (1992)
Minority population share	Per cent minority	Minorities at Risk Project (2005)
Homicide rates	Number of homicides per 100,000 population	World Health Organization (1951–1964, 1962–1988), WHO Regional Office for Europe (2009)