

Gender, Indigeneity and Social Class: Criminal Sentencing in British Columbia, 1864-1913*

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Abstract

Using provincial prison admission ledgers, we document the sentencing behaviour of judges through an institutionally transformative period in British Columbia (BC) (1864-1913). We find systemic biases in sentencing outcomes that result in relatively lenient sentences for women, Indigenous people, and individuals of Chinese origin. We find comparatively longer sentences for workers in low-skill occupations. Over time, we find that these biases shifted for women, and for Chinese and Indigenous people, concurrent with shifting social norms and major historical events, such as the building of the Canadian Pacific Railway and the passage of the federal government's *Indian Act*. We use the probability each prisoner's predicted future recidivism to test for the presence and impact of statistical discrimination. We find evidence of significant statistical bias, but the effect on sentencing is small, and most of the leniency we document can be attributed to judge's taste-based discriminatory attitudes.

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1 Introduction

Since Gary Becker’s (1957) seminal characterization of discrimination in labour market outcomes, economists have expanded their definitions of discrimination and bias (Phelps, 1972; Arrow, 1973; Bertrand et al., 2005), and broadened their analysis of discrimination into a wide range of social, economic, and political settings (Lang and Kahn-Lang Spitzer, 2020).

One area of particular interest has been bias in the criminal justice system. Voluminous work focuses on biases with respect to race (Mustard, 2001; Blair et al., 2004; Spohn et al., 1981; Burch, 2015), gender (Godfrey et al., 2005; Starr, 2015; Sorensen et al., 2014), social and economic class (Vickers, 2016), and physical traits (Leventhal and Krate, 1977; Johnson and King, 2017). The presence and impact of bias has been studied in the context of jury composition (Anwar et al., 2012, 2019), judicial traits (Cohen and Yang, 2019; Philippe, 2017; Schanzenbach, 2005), bail decisions (Arnold et al., 2018), and prosecutor behaviour (Rehavi and Starr, 2014).

Perhaps the most prominent area of study has been bias in the sentencing decisions of judges (Levitt and Miles, 2007). In particular, researchers have explored on the extent to which legal and extralegal factors are incorporated into sentencing decisions (Shermer and Johnson, 2010; Radzinowicz and Hood, 1978; Bushway and Piehl, 2001). In this paper, we use provincial prison admission ledgers to document the sentencing behaviour of judges in late nineteenth and early twentieth century British Columbia (BC). Sentencing patterns allow us to distinguish *taste-based* (Becker, 1957) from *statistical* (Arrow, 1973) discrimination within BC’s rapidly evolving legal, institutional, and cultural environment.

We focus on three tasks. First, we document sentencing patterns between 1864 and 1913, identifying extralegal biases in sentence severity while controlling for a broad set of legal and extralegal factors. Our empirical specifications are based on sentencing equations similar to those used by Howard Bodenhorn (2009) in his analysis of late nineteenth century criminal sentencing in Pennsylvania, and they are conceptually consistent with both rational (Becker, 1968) and behavioural (Gelbach, 2021; Teichman and Zamir, 2014) sentencing models. We employ LASSO (Tibshirani, 1996) model selection criteria to determine the maximally predictive determinants of sentences. In doing so, we take a “data-driven” approach to characterizing sentencing behaviour rather than having to choose explanatory variables based on (potentially biased) *a priori* modelling assumptions. Our sentencing equations reveal systemically shorter sentences for Indigenous people and women, even after controlling for crime class and other observable characteristics. We also find that individuals of Chinese-origin received shorter sentences, unless they are railroad workers. In contrast,

individuals working in low-skilled occupations received longer sentences on average.

Next, we use our empirical specification to estimate rolling regressions through nine-year estimation windows. The time varying estimates allow us to analyze how the marginal determinants of judges' sentencing decisions changed over our period of study. When we do this, several interesting patterns emerge. The leniency judges show Indigenous prisoners is present over the entire sample period, and perhaps surprisingly, it increases after the passage of the federal *Indian Act* in 1876. The shorter sentences we observe for women are driven primarily by judicial discretion in the earlier years of our sample. Although in a modern context, it is generally accepted that women receive lesser sentences than men (Godfrey et al.; 2005; Ahola et al., 2009; Starr, 2015; Sorensen et al., 2014), we demonstrate that in BC this bias was mostly dissipated by the early twentieth century.¹ We also find that the leniency shown to individuals of Chinese origin only takes hold during the post-1886 years. Prior to this – during the construction of the Canadian Pacific Railway (CPR) – the Chinese in BC's criminal justice system faced sentences at least as harsh as the average prisoner.

Finally, we seek to determine the extent to which the discriminatory sentencing we observe can be attributed to judicial tastes or rational statistical biases. We note that in a rational choice model of criminal sentencing, such as Becker (1968), if a prisoner has observable characteristics consistent with a higher probability of re-offending in the future, then an optimal sentence for them should be harsher. We employ the panel nature of our data to predict future recidivism for all individuals based on their observable characteristics. We then include predicted future recidivism as an additional explanatory variable in our sentencing equation. This approach allows us to detect significant evidence of statistical bias, but the impact of this statistical bias on sentencing is small, and we generally cannot rule out a larger effect for taste-based bias in criminal sentencing in BC over our period of study. The illustrative example of sailors demonstrates the potential for statistical bias to have a substantive effect on sentencing – their predicted future recidivism is low because of the transient nature of their residency in BC, and only after controlling for this source of statistical bias, do we find that sailors' sentences were indistinguishable from the average prisoner. Similarly, for Chinese prisoners, sentencing leniency remains at conventional levels of statistical significance after controlling for predicted future recidivism, but the size of the bias is reduced by over 3.0 percentage points. For Indigenous prisoners the result is similar – including the probability of reoffending reduces their differential sentences by almost 5.0 percentage points. For women, on the other hand, we observe a small *increase* in bias once

¹The sentencing bias in favour of women is not universal. We note that there are other environments in which researchers have found no difference in sentencing outcomes for men and women (Kruttschnitt and Savolainen, 2009; Crew, 1991).

we control for the fact that female prisoners were very unlikely to reappear in the prison ledgers after their first offence.

In interpreting these results we note that predicted future recidivism may be only one factor driving statistical bias, but in our attempt to control for it, we can confirm the presence of both statistical and taste-based bias. A common explanation for lenient sentences for women in a modern context is ‘paternalism’ (Bindler and Hjalmarsson, 2020; Daly, 1989; Moulds, 1978; Gruhl et al., 1984; Chesney-Lind, Chesney-Lind). While we are not in a position to fully characterize judges’ lenient treatment of female prisoners in BC, we can conclude that because their sentencing differentials are insensitive to predicted future recidivism, the bias we observe toward women is likely a function of taste-based judicial paternalism. We posit a similar rationale with respect to Indigenous prisoners, although in their case statistical bias captured by predicted future recidivism does slightly reduce the leniency in their sentences. We attribute this to the fact that the *Indian Act* systematically reduced the frequency of contact between Indigenous communities and the BC criminal justice system after its introduction in 1876. Even in the presence of significant statistical bias, we cannot rule out taste-based sentencing differentials for Indigenous prisoners.

The paper proceed as follows. Section 2 describes our data and empirical strategy. Section 3 documents sentencing patterns, both for our pooled data and over time. Section 4 presents our approach to identifying statistical versus taste-based discrimination and presents our findings. Section 5 concludes.

2 Data and Empirical Strategy

In this section, we describe the source of our data, its compilation and sample selection issues, and our main variables of interest. We then describe our sentencing equations and their estimation.

2.1 British Columbia Provincial Prison Admission Ledgers

Admission records have survived and been manually digitized from the original hand written, bound ledgers for the provincial prison in Victoria from its opening in 1864 until 1914 (Inwood and Roberts, 2020).² For the provincial prison in New Westminster, records are also available from its opening in 1875 to 1914. Other ledgers have been digitized from 1911 to 1919 for smaller prisons in Nanaimo, Saanich, and Quesnel, although the evidence

²Greater detail on sample composition and construction can be found in Inwood and Keay (2021), and Inwood et al. (2022).

presented in this paper only uses entries from Victoria and New Westminster up to 1910, with a small number of entries from Nanaimo added for some specifications from 1911-1915. In total 33,296 entries have been digitized, describing 28,200 prisoners. To ensure sample consistency over time, we use only those admission records that survive the imposition of three sample restrictions: (i) we drop all records for individuals who were not found guilty of a criminal offence (approximately 12% of entries); (ii) we drop admission years after 1913 (4.5% of entries); and (iii) we drop entries that include sentences that were less than seven days or more than two years (approximately 30.5% of entries).

The first sample restriction removes records for individuals who found themselves in prison awaiting trial or bail, those being kept for safe keeping, witnesses, and “lunatics”. Over our period of study these types of entries become increasingly rare and none of these individuals received sentences for criminal offences. The second restriction is imposed because the number of prisoners admitted into BC’s provincial prisons after the start of WW1 falls sharply, and the characteristics of those admitted after the initial wave of WW1 enlistment (and later forced conscription) change abruptly.³ The third sample restriction maintains a common domain for the distribution of sentences over our period of study. Kolmogorov-Smirnov tests for common sentence distributions in consecutive years between 1864-1913 confirm that there were significant changes in the upper tail (sentences greater than 2 years) during the late 1870s, and the lower tail (sentences less than 7 days) during the mid-1880s. These shifts in the sentencing distributions coincide with the opening of a federal penitentiary in New Westminster in 1878, and the reallocation of all prisoners who were sentenced by a local Police or Provincial Court from the provincial prisons to local police lock-ups during the 1880s. The imposition of our three sample restrictions leave us with 17,586 admission records available for analysis in this study.

2.2 Hard Labour-Equivalent Sentences

86% of all admission records for BC’s provincial prisons from 1864-1913 record a “sentence”. Virtually all entries that do not include a sentence are for individuals who have not been found guilty of a crime, and they have been dropped from our restricted sample. For the entries with a sentence recorded, there is a remarkable range of information provided, including the value of costs, damages and fines, length of imprisonment, hard labour, life sentences, death by execution, and various forms of punishment, such as flogging, bread-and-water, solitary confinement, and half rations.

³There is one exception to the pre-WW1 sample restriction – the last estimation windows in our rolling regressions add entries from Nanaimo for 1914 and 1915.

To combine the sentencing details into a single consistently defined measure of sentence severity that can be compared across prisoners, crimes, and time, we convert all sentences into hard labour-equivalent days of imprisonment. To derive hard labour-equivalents we first group sentences into categories that include: costs, damages or a fine; imprisonment; hard labour; some form of punishment; and life in prison or death sentences. Within these categories, we then distinguish sentences that include more than one of these penalties (AND sentences), and sentences that include options (OR sentences).

The OR sentences gave prisoners a choice among penalties, and they reveal the relative values, in terms of equivalent severity, that judges in BC placed on the specific penalties and sentence components. Judges in BC, for example, consistently viewed one day of hard labour as approximately equivalent to two days of regular imprisonment; each stroke from the lash or whip was equivalent to about 4.5 days of hard labour; and each day of solitary confinement, bread-and-water, or half rations was worth about two days of hard labour. We consider the 41 life and death sentences recorded in the ledgers to have been equivalent to 35 years of hard labour, based on the average age at admission for those receiving life and death sentences – approximately 30 years – and an assumed average life expectancy of 65 years.

Unfortunately, using OR sentences to value costs, damages or fines in equivalent days in prison is challenging because option sentences become extremely rare during the second half of our period, and even during the 1860s and 1870s the variation in fine-per-day equivalents across crimes and years was very high. We adopt an approach to assigning hard labour equivalents to dollar values that is similar to that used to value statistical lives (Ajzenstadt, 2002; Goldin and Lewis, 1975). Specifically, we use low-skilled, semi-skilled, and high-skilled daily wages from Vancouver and Victoria to value costs, damages and fines in terms of forgone days of labour.⁴

Between 1864-1885, the average prisoner in BC’s provincial prisons was sentenced to the equivalent of 70.8 days of hard labour. This rose to 114.7 days between 1886-1913. When valued in terms of nominal, skill-specific wages, over the whole period the average sentence is equivalent to \$236.62 in forgone income, or slightly more than double GDP per capita in Canada in 1885. We also note that average sentences before 1885 are significantly lower than average sentences after 1885; there is no significant linear time trend in sentences before, or after 1885; and the annual coefficients of variation across prisoner-specific sentences are significantly higher during the years before 1885 (Inwood et al., 2022).

⁴Skill and city specific wages have been calculated from Emery et al. (2007); Inwood and Irwin (2002); Urquhart and Buckley (1965); Belshaw (2009); and Harris et al. (2015).

2.3 Classifying Criminal Offences

In addition to the remarkable level of granular detail in the ledger entries describing prisoners' sentences, just over 96% of these entries also provide a reason for admission. To organize the information in the ledger columns that identify an "Offence", we group prisoners into 12 broad crime classes that match the offence categories specified in the 1892 federal *Criminal Code* (Inwood and Keay, 2021; Inwood and Roberts, 2020). We include an "All Other" broad crime class to capture all offences specified in the ledgers that do not obviously fall within any of the *Code's* categories, and we group all offences that in some way specify Indigeneity (mostly related to violations of the *Indian Act*). The most common broad crime classes specified in the ledgers include offences related to "Alcohol and Drugs", which account for over 10% of the prisoners serving between seven days and two years; "Property" crimes, which account for about one quarter of entries; and crimes "Against Public Order", which make up 22.5% of our restricted sample of ledger entries.

Of course 14 broad crime classes do not come close to exploiting all the detail included in the ledgers. In our sentencing equations (described below) we further disaggregate these broad categories into 76 narrowly defined crime classes. To provide an illustrative example consider the broad category of property crimes, which are divided into six narrower classes, including: arson; attempted theft; damage to property; possession of stolen property; theft; and property crime with violence.

2.4 Prisoners' Observable Characteristics

The admission ledgers also provide us with a wealth of information about prisoners' observable characteristics. Without photographs or other means of biometric identification, detailed descriptions of prisoners' physical appearance, temperament, and occupation would have been the only source of identification available to authorities (Antonie et al., 2021).

Birthplace, nationality, or ethnicity is recorded for over 90% of all prisoners in the admission ledgers. Indigenous prisoners, for example, make up over 44% of all new admissions before 1885, but that share drops to less than 13% after 1885. The average new inmate in BC's provincial prisons was about 32 years of age, and well over 90% of the prisoners were men. There was a small decline in the proportion of female prisoners after the early 1880s that is correlated with the decline in Indigenous prisoners – a large majority of female prisoners were Indigenous.

Height in feet and inches is recorded for nearly 90% of the prisoners in our sample, and we find that on average the BC prisoners were approximately the same height as their

criminal peers in Ireland, England, and Pennsylvania (Bodenhorn et al., 2012; Steckel, 2008). Perhaps a bit surprisingly, literacy was quite high among the prisoners in BC over the late nineteenth and early twentieth centuries, averaging slightly over 60%. About half of the prisoners were identified as Protestant, 25% Catholic, and nearly 20% claimed no religious affiliation.⁵

The ledger entries often include some indicator of the prisoner’s health when admitted. The prisoners are typically described as being healthy, however, over time the entries suggest some worsening in health status – “Grey”, “Sallow”, or “Haggard”, become much more common descriptors near the end of our period. The prisoners’ skin tone, hair, and eyes are also described, and we find that the share of prisoners with a light complexion, blond hair, and blue eyes was rising, while the decline in Indigenous prisoners coincided with a drop in prisoners described as having dark skin, black eyes, and black hair.⁶

More general descriptions of the prisoners’ bodies are included in the ledgers under labels such as “Build” or “Proportion”. The prisoners’ conduct is consistently recorded as either “Temperate” or, for those prisoners who were known to be disruptive or who had problems with alcohol or drugs, “Intemperate”. The ledges list prisoners’ distinguishing marks – a category dominated by descriptions of scars and tattoos.⁷

An occupation is listed for about 80% of the admission entries. We group occupations based on the categories used in the 1901 Canadian census (Inwood and Keay, 2021), before aggregated these categories into skill or social class groups: high skilled; semi-skilled; low skilled; no occupation (Bodenhorn, 2009; Reiss, 1965). The prisoners are split fairly evenly between low-skilled and semi-skilled occupations, although the lower skilled are more common early in the period. Among the specific occupations recorded in the ledgers, the most common is “labourer”, although see a fairly sharp increase in the share of fishers, loggers, miners, manufacturing workers, and service sector workers through the post-1885 years.

A final characteristic that is only infrequently explicitly recorded in the ledgers is recidivism. We use prisoner identification numbers, names, and time invariant prisoner characteristics – including birth year, gender and ethnicity – to identify repeat offenders who appear in the ledgers more than once. In total, nearly one-quarter of all prisoners are recorded multiple times. Among the recidivists the average number of prison admissions is just over 2.6, and one prisoner – Lawrence M., an Irish-American who made a career from theft and selling

⁵“No Religion” is associated with an explicit entry in the religion field in the ledgers, typically “atheist”, “agnostic”, or “no religion”. Blank entries for all descriptive categories are coded as “NA”.

⁶We use Block (2018) to group these “colonial complexion” descriptors.

⁷We group distinguishing marks by body part, and separately as broad “sympathetic marks” and “unsympathetic marks” categories.

alcohol to Indigenous individuals, thereby violating the *Indian Act* – appears 44 times. We record how many times each prisoner appears in the ledgers in total, how many times each new entrant has already appeared (past recidivism), and how many times each new entrant will appear at a later date (future recidivism).

2.5 Empirical Strategy: Sentencing Equations

To assess sentencing patterns across crime classes, prisoner characteristics, and time, we specify sentencing equations similar to those used by Bodenhorn (2009) to explore the determinants of criminal sentencing in Pennsylvania during the late nineteenth century. Our equations allow us to identify the impact of three sets of determinants on judicial decision-making. The first set of determinants include formal, codified legal factors, such as crime class, past recidivism, and indicators of sentence structure – fines, damages, punishment, or hard labour, for example. The second set of covariates includes the extralegal determinants that judges might have used as proxies or signals for future recidivism risk, danger to the public, or the denunciation and deterrence effect of their sentences. These extralegal determinants include prisoners’ ethnicity, gender, height, occupation or social class, and physical or distinguishing features. The third and final set of determinants includes time varying, system-wide factors that affect all sentences and all criminals equally in a given year. These factors are captured by admission year fixed effects. Our sentencing equations take the form:

$$\log(\text{Sentence}_{it}) = \psi_t + \beta_t Y_t + \delta_t LD_{it} + \gamma_t XLD_{it} + \epsilon_{it}$$

Where: i indicates an admission record; t indicates an admission year; Y are admission year fixed effects capturing system-wide determinants that vary over time, but (proportionately) affect all sentencing decisions in a given year equally; LD are legal determinants that include fixed effects for 76 narrow crime classes, sentence structure, and past recidivism; XLD are extra-legal determinants, including fixed effects for up to 80 observable prisoner characteristics; and ϵ represents a residual that captures unobservable idiosyncratic sentence determinants that are uncorrelated with Y , LD , or XLD . The parameters to be estimated in our sentencing equations $(\psi, \beta, \delta, \gamma)$ have time subscripts because we use rolling regressions with nine-year estimation windows ($t - 2$ to $t + 6$) when we calculate time-varying marginal sentencing effects.

All sentences are measured in hard labour-equivalent days in prison. We use the natural logarithm of sentence length for the dependent variable because even with our sample restrictions, sentences are skewed towards longer terms. All legal and extra-legal sentence determinants are categorical, taking the value 1 for prisoners with the given characteristic,

crime class, or sentence structure, 0 otherwise (Inwood et al., 2022). All sentencing equations are estimated by OLS, with standard errors clustered by (narrow crime class \times admission year) – 1,420 clusters in full estimation window.

The parameter estimates from our sentencing equations allow us to identify the marginal sentencing impact of all legal, extralegal, and system-wide determinants. Any omitted determinants are grouped into the constant ψ_t , so the estimated marginal impact of any of the included factors is measured relative to the average prisoner, as characterized by the omitted observable characteristics. This suggests, therefore, that sentencing patterns for any determinant will not depend on the inclusion of any of the more than 80 extralegal covariates that can be extracted from the admission ledgers. Of course, many of the prisoners’ observable characteristics are strongly collinear – Indigeneity, dark skin, black hair, black eyes, literacy, marital status, and occupation, for example, are all strongly correlated across prisoners. Following from these considerations, we rely on a parsimonious version of the sentencing equation that includes only the extralegal determinants that are relatively uncorrelated with the other right-hand-side variables, while still being strongly predictive of prisoner-specific sentencing outcomes.

To select covariates for inclusion in the parsimonious sentencing equation, we use a least absolute shrinkage and selection operator (LASSO) to pick out prisoner characteristics with relatively high predictive power and low covariance with the other sentencing determinants (Derenoncourt, 2019; Tibshirani, 1996). After partialling out all crime class and admission year fixed effects, our LASSO estimates guide us in the selection of just six legal determinants and 20 extralegal determinants for our preferred parsimonious specification. Again, we emphasize that the parsimonious specification groups many more prisoner characteristics into the omitted category captured by the constant term in the regression. For our purposes, aggregating characteristics in this way expands the characterization of the ‘average prisoner’, but it does not affect any of the qualitative conclusions related to the marginal sentencing effects we document.

3 Sentencing Patterns

We turn now to the results from our estimation of the parsimonious sentencing equation specified in Equation (1). The parameters reported in Table 1 represent fixed marginal sentencing effects, estimated over all 1864-1913 admission years. In terms of magnitude, these parameters illustrate several noteworthy instances of bias in criminal sentencing, even after controlling for narrowly defined crime classes, other legal determinants, and prisoners’

observable characteristics.

First, we note that Indigenous prisoners received much shorter sentences on average, relative to the average prisoner. The marginal sentencing coefficient associated with being Indigenous, approximately -0.26 log points of hard labour-equivalent days, reflects a reduction in sentence length for a given crime class of about 23.0 percent. The marginal sentencing effect associated with being of Chinese-origin reveals another interesting pattern. While these individuals also received shorter sentences on average, (about 13.7 percent fewer days), during the building the Canadian Pacific Railway when temporary migration of Chinese railway workers into BC was very high, Chinese-origin prisoners received sentences that were more than 28.0 percent longer than the average prisoner.

An empirical regularity that has been identified in both historical and modern sentencing data is the relatively lenient sentences that women receive. We also find this result in BC during the late nineteenth and early twentieth centuries, with female prisoners receiving sentences that were 14.0 percent shorter on average for a given crime. In modern settings, this gender-based leniency is typically interpreted as evidence of paternalism in sentencing (Bindler and Hjalmarsson, 2020; Daly, 1989; Moulds, 1978; Gruhl et al., 1984; Chesney-Lind, Chesney-Lind) – consistent with the notion that women are somehow viewed as weaker than men, and as such in need of protection from the hardship of prison time. A related notion found in the literature is that single men should receive relatively harsh sentences because they have no wives or families to support, and we also observe this form of paternalism in the parameters reported in Table 1 – unmarried prisoners received sentences 4.1 percent longer than the average prisoner.

Other possible instances of paternalism in the sentencing patterns revealed in Table 1 include significantly shorter sentences for prisoners described in the ledgers as small or thin, and for prisoners who were balding. These marginal sentence effects could be consistent with leniency directed towards those who were, or at least appeared to be, older. Also consistent with the typical life-cycle profile of criminality (Bindler and Hjalmarsson, 2017), we find that prisoners in their 20s received sentences that were significantly longer than the average prisoner in all other age groups.

Turning to measures of occupation skill, which we interpret as a proxy for social class, we find that prisoners who reported the least skilled occupations received sentences that are 5.3 percent longer than the average prisoner for a given crime. It seems that judicial paternalism did not extend into the labour market or social hierarchy at the end of the nineteenth and beginning of the twentieth centuries in British Columbia. To foreshadow an

interesting illustrative example we will be describing in more detail below, we note that after controlling for crime class, legal determinants, and other observable characteristics, sailors received sentences that were 6.4 percent lower than the average prisoner.

Our period of study covers admission years from 1864 to 1913. During this era British Columbia experienced institutional and cultural changes that transformed the legal and social environments in the province (Inwood et al., 2022). It is reasonable to expect that the sentencing patterns we observe by pooling our data over the late nineteenth and early twentieth centuries, may not have been fixed over the entire period. Certain sub-periods characterized by exceptional episodes of change may drive the average marginal sentencing effects reported in Table 1. Our sentencing equations include admission year fixed effects, but they can not account for the possibility that judges' marginal sentencing behaviour may have shifted in response to the changes that were occurring in BC's institutional and cultural environment. To assess how judicial decision-making may have changed over the 1864-1913 period, we again estimate Equation (1), but rather than pooling all admission years, we estimate a series of rolling regressions through 9-year estimation windows. The key time-varying parameter estimates are presented in Figure 1.

From Figure 1 we can immediately see that, to varying degrees, the marginal sentencing effects were not constant over our period of study. In some cases, such as that of sailors, they fluctuate but are generally close to the pooled result reported in Table 1. Similarly, for prisoners with low-skilled occupations, there is a limited difference between the fixed and rolling marginal effects.

For Indigenous prisoners, Figure 1 demonstrates that their sentences were relatively short over the entire period. However, it is interesting to note that the Indigenous inmates experienced a slow decline in sentence severity after the passage of the *Indian Act* in 1876 and its amendments in the early 1880s, followed by a sharp rise in marginal sentence length during the decade just prior to WW1.

For female prisoners a very distinct pattern in sentencing emerges. While the fixed marginal effect associated with female prisoners indicates that women received much shorter sentences than men for a given crime, our rolling marginal effects demonstrate that this leniency is driven by much lower, and sharply falling sentences, hitting a minimum around 1880. Over the post-1880 admission years, female prisoners' marginal sentences rose steeply, such that they were higher than the average prisoner for a few years around 1900. When we dig deeper into the crime specific data, we find that the marginal sentencing effect associated with being female moved closely with the share of women being incarcerated in BC's

Table 1: Sentencing Patterns, 1864-1913

Dep. Variable = ln(Hard Labour-Equivalent Days)		
Sentence Determinant	Parameter Est.	Std. Error
Past Recidivism	0.1918***	(0.020)
Incl. HL	0.5024***	(0.029)
Incl. Cost or Fine	-0.4644***	(0.080)
AND Sentence	0.4850***	(0.051)
Victoria Gaol	-0.0606**	(0.031)
Fall Admission	0.0466**	(0.020)
Cdn Non-Indigenous	0.0452**	(0.022)
Indigenous	-0.2601***	(0.032)
Chinese-Origin	-0.1369***	(0.040)
Chinese x RR Building	0.2460***	(0.095)
Age 20-29	0.0409***	(0.015)
Q1 Height	0.0520***	(0.016)
Q4 Height	-0.0593**	(0.028)
Female	-0.1492***	(0.037)
Uses Alias	0.1072***	(0.037)
Single	0.0401**	(0.020)
Other Religion	0.1757***	(0.043)
Unhealthy Complexion	0.1030***	(0.029)
Stout Proportion	-0.0520**	(0.024)
Small or Thin	-0.0401*	(0.021)
Balding	-0.1168**	(0.055)
Intemperate	-0.1083***	(0.019)
Unflattering Marks	0.0464**	(0.018)
Low Skilled	0.0518**	(0.021)
Military or Police	-0.3629***	(0.126)
Sailor	-0.0660**	(0.031)
Constant	3.821***	(0.041)
Narrow Crime Class FE		Yes
Admission Year FE		Yes

$N = 17,584$. $R^2 = 0.378$. Restricted sample — sentences less than 7 days and more than 2 years are omitted. Standard errors in parentheses and clustered by (narrow crime class x admission year). * indicates statistical significance with 90% confidence; ** indicates statistical significance with 95% confidence; *** indicates statistical significance with 99% confidence.

provincial prisons for drug and alcohol offences.

The marginal sentencing trends for prisoners of Chinese origin also exhibit large fluctuations over our period study. The fixed marginal sentencing effect reported in Table 1 indicates that prisoners of Chinese origin received comparatively short sentences relative to the average prisoner. The rolling marginal effects depicted in Figure 1 illustrate that this is driven mainly by increasing leniency through the 1890s and first years of the twentieth century. Prior to the 1890, there is no discernible sentencing effect (or possibly a small positive effect) associated with being Chinese in BC’s provincial prison ledgers. Recalling the harsh sentences imposed on those of Chinese origin during the railway building boom, as reported in Table 1, it is noteworthy that once the CPR was completed in 1886, and temporary migration from China slowed to a trickle, sentences for individuals of Chinese origin fell to be significantly lower than the average prisoner. During the decade before WW1, sentences for Chinese prisoners began to increase again, coincident with an era of rising anti-Asian sentiment in British Columbia.

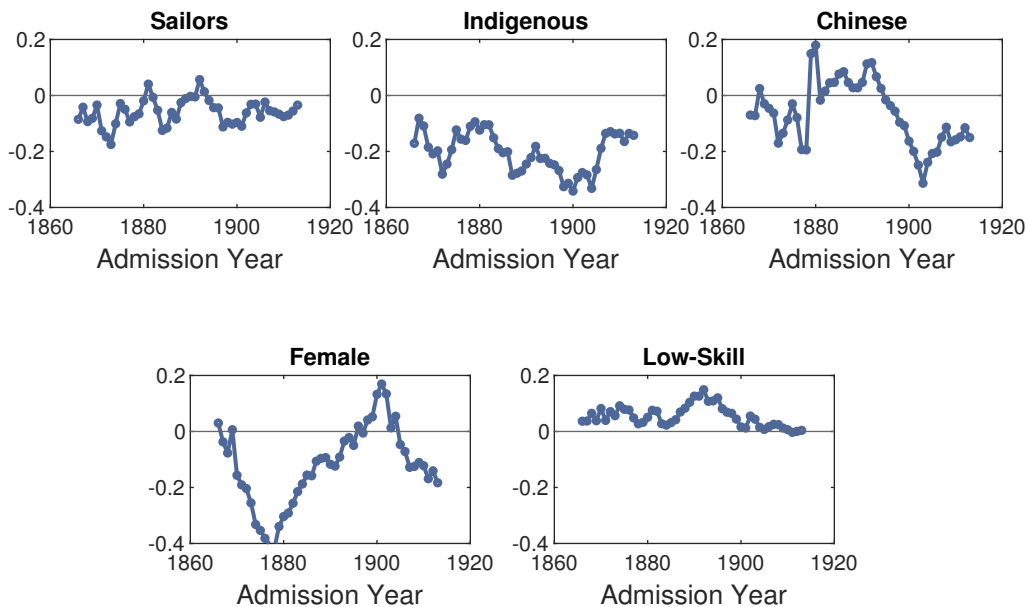


Figure 1: Sentencing Trends for Selected Groups

4 Taste-Based Versus Statistical Discrimination

Our sentencing equations reveal evidence of both positive and negative biases in criminal sentencing in BC during the late nineteenth and early twentieth centuries. We turn now to the task of developing a deeper understanding of these biases through the opposing, but non-mutually exclusive lenses of *taste-based* (Becker, 1957) and *statistical* discrimination

(Arrow, 1973; Phelps, 1972). Originally conceived as an explanation for unequal labour market outcomes between groups, we map these alternate explanations for discrimination into the criminal justice space in an effort to document the presence of, and relative salience of each factor in determining the sentencing patterns reported in Table 1 and Figure 1.

Bias in criminal sentencing could plausibly be explained by taste-based discrimination because judges, as conduits for cultural norms, might simply exhibit animus towards individuals of Chinese-origin or low-skilled workers, for example. It could also be that judges have a favourable impression of sailors, and correspondingly levy short sentences on them. The notion of paternalism is another example, which in our case, could explain the shorter sentences we observe for women, and potentially, Indigenous prisoners.

As an alternative explanation, statistical discrimination could also explain at least part of the patterns of bias we observe. For instance, it may be that the factors determining a women’s decision to commit a particular class of crime, such as their probability of apprehension, payoffs, or the disutility of imprisonment, could differ from men in such a way that socially optimal sentences as characterized by Becker (1968) should be different between the two genders. For low-skilled workers, it could be that the opportunity cost of crime is lower because they earn relatively low wages in legal activities, and as a result, the probability that they reoffend might be unusually high. Or perhaps the denunciation value of punishment for those with low-skilled occupations is lower because the media only report on the most sensational trials and the most severe penalties for these individuals. In either case, it would be rational for the optimal punishment for a prisoner with a low-skilled occupation to be higher.

For Indigenous communities in BC, the *Indian Act* – and particularly a series of amendments during the early 1880s – drastically limited geographic mobility, thereby reducing the opportunity for interaction between those deemed to be ‘Indian’ by the Canadian government and the colonial criminal justice system. A rational judge, therefore, might reasonably expect the likelihood of re-offending for Indigenous prisoners to have been significantly reduced after these amendments came into effect, and optimal sentence severity would then be reduced.⁸

⁸To be more precise, the 1876 *Indian Act* introduced the reserve system, after which most Indigenous people came to live on what were typically geographically remote reserves. An 1881 amendment to the *Act* introduced Indian agents – state officials that served as liaisons to the reserve population and acted as magistrates for a variety of legal matters or disputes. Following other amendments in 1884 and 1885, Indigenous individuals’ freedom to leave their home reserve without the written permission of their local Indian agent was severely curtailed.

4.1 One Dimension of Statistical Discrimination: Predicted Future Recidivism

Sailors provide us with a clear, intuitively satisfying illustrative example of the impact of one key dimension of statistical discrimination in our historical and geographic context – the probability of re-offending. *A priori* we might expect sailors to be viewed rather negatively in the BC criminal justice system – they comprise the second most common occupation recorded in the admission ledgers, they were overwhelmingly young men, they tended to be heavily tattooed and scarred, and their crimes were often both socially disruptive and violent (drunk and disorderly, or property crimes with violence, for example). However, from Table 1 we see that after controlling for observable characteristics, the sailors in BC’s provincial prisons were serving shorter sentences than the average inmate. This finding is inconsistent with our expectations with respect to taste-based bias in sentencing. To explain this inconsistency we must recall that Victoria and Vancouver (New Westminster) were important transport hubs around the turn of the twentieth century, and Victoria was home to a large and active naval base. While this helps to explain why so many sailors appear in the admission ledgers, it also means that most of these sailors would not have been permanent BC residents – they were transient workers in Victoria and New Westminster. As such, they would have left BC upon their release from prison, and their probability of re-offending (in BC at least) would be low. Thus, an optimal sentence structured in part to reduce the probability of future recidivism, should be lower, holding all else constant. Identifying the marginal sentencing impact of statistical discrimination due to predicted future recidivism also allows us to confirm the presence of (residual) taste-based discrimination.

Although sailors are a nice example to show how our methodological approach works, our main focus in this paper is on discriminatory sentencing in late nineteenth and early twentieth century BC based on gender, Indigeneity and social class. We continue our investigation by predicting and controlling for future recidivism in our sentencing equations, and testing for the impact of this additional control on differences in sentence severity. This approach allows us to distinguish between statistical and taste-based biases in sentencing in our historical and geographic context.⁹

To quantify prisoner-specific re-offending risk, we exploit a useful feature of our data – the repeat admissions of a sizeable portion of the prisoners listed in the ledgers. We observe approximately 24.5 percent of the prisoners more than once, and 2.4 percent of

⁹An alternative approach to test for taste-based preferences is the rank-order test developed by Anwar and Fang (2006) and employed by Park (2017). Unfortunately, because we cannot identify the race of judges in BC, and because there was almost certainly no racial variation available for identification, we cannot adopt this approach. This limitation also rules out applying the tests described by Knowles et al. (2001) and Antonovics and Knight (2009).

the prisoners appear more than five times. This means that we can observe both past and future recidivism for each prisoner. Using an indicator of future recidivism for each admission entry, we can estimate the probability of re-offending based on the individual’s observable characteristics. We can then use this predicted likelihood of future recidivism as an additional sentencing determinant in Equation 1. The size and statistical strength of predicted future recidivism in our sentencing equations provides us with an estimate of the impact of statistical discrimination (at least with respect to the likelihood of re-offending), while any remaining effect due to the prisoners’ observable characteristics confirms that taste-based discrimination played a role in the observed marginal sentencing differentials.

Following Dawinder Sidu (2015), we execute our empirical strategy by first predicting the probability of future recidivism with a probit regression that includes an indicator for future recidivism as the dependent variable, and prisoners’ observable characteristics (as selected by our LASSO criteria for inclusion in Equation 1) as the explanatory variables.¹⁰ Of course, if we only included our sentencing equation determinants in the first stage probit, the impact of predicted future recidivism could not be separately identified when included as an additional regressor in Equation 1. At least one determinant of future recidivism, that is not directly correlated with sentence severity, is needed to identify the impact of the likelihood of re-offending on sentencing.

LASSO does not pick natural resource employment (fishing, logging, mining) for inclusion in our sentencing equations because (conditional on other observable characteristics) these occupations were not significantly related to sentence severity – an indicator for natural resource employment has a statistically insignificant estimated coefficient of -0.051 in Equation 1, with a standard error of 0.035 (see Table 3). However, because the semi-skilled occupations in the rapidly growing natural resource sector in BC in the years around 1900 were relatively well-paid, and located in geographically remote regions, we can reasonably expect that the probability of re-offending for fishers, loggers, and miners would be relatively low. As a result of these considerations, we include an indicator for natural resource employment as an additional explanatory variable in our probit predicting future recidivism.

4.2 Results

The impact of the prisoners’ observable characteristics, including an indicator for natural resource employment, on predicted future recidivism are shown in Table 2. Here, we find intuitively satisfying results, and importantly, some results that are conducive to our empir-

¹⁰We note that the qualitative results when we use a linear probability model rather than a probit are very similar to those reported in this section.

ical strategy. First, we note that past recidivism (meaning those who were already repeat offenders) was a strong predictor of future recidivism. This result is analogous to results from Anna Bindler and Randi Hjalmarsson (2019), who find path dependence in jury decisions from London’s *Old Bailey* during the same historical period. We also find that sailors were much less likely to re-offend than the average prisoner, as were Indigenous prisoners and prisoners of Chinese-origin. A key for identification with our approach is the impact of natural resource employment on the probability of future recidivism, which we find to be statistically distinguishable from 0 and, as expected, fairly large and negative. Interestingly, gender and occupational skill-level have only small, and statistically insignificant effects on the likelihood of re-offending.

Turning to the main focus of our study, the first columns in Table 3 include the baseline marginal sentencing effects for the key observable characteristics (as reported in Table 1) – Indigeneity, Chinese-origin, female, and low-skilled. We also replicate the results for sailors and the average prisoner (the constant ψ), and we include the marginal sentencing effect for natural resource occupations.¹¹ In the next columns in Table 3 we report the estimated coefficients for the same key characteristics from a sentencing equation specification that includes predicted future recidivism as an additional regressor. The final column reports the results from a chi-squared test of the null hypothesis that the coefficients are the same in both specifications.

First, we note that the results confirm that after controlling for other observable characteristics, natural resource employment does not significantly affect sentence length. Predicted recidivism, on the other hand, has a very large and strongly statistically significant effect on sentencing – if a judge was certain that a particular prisoner would re-offend in the future, their sentence would be 0.74 log-points, or approximately 70% longer than the average prisoner for a given crime.

Again, we report the results for sailors as an illustration of the impact that controlling for predicted future recidivism can have on marginal sentencing. From Table 2 we see that sailors were significantly less likely to re-offend, and from Table 3 we see that when we control for this fact, the negative sentencing differential enjoyed by sailors in our baseline specification drops by more than half, and becomes statistically indistinguishable from 0. In short, the favourable sentencing bias BC judges showed towards sailors during the late nineteenth and early twentieth centuries appears to have been due to statistical discrimination – sailors were much less likely to re-offend in BC, so it was rational to sentence them to shorter terms

¹¹For ease of exposition, we do not present the estimates for the other observables picked for inclusion by our LASSO criteria. Complete estimates for all specifications are available upon request from the authors.

Table 2: Determinants of Future Recidivism

Dep. Variable = 1 for Future Recidivists, 0 Otherwise		
Recidivism Determinant	Probit	
	Parameter Est.	Std. Error
Past Recidivist	0.7937***	(0.039)
Incl. HL	0.1174***	(0.036)
Incl. Cost or Fine	0.0156	(0.096)
AND Sentence	0.0702	(0.069)
Victoria Gao	0.1707***	(0.040)
Fall Admission	0.0472	(0.037)
Cdn Non-Indigenous	-0.0317	(0.036)
Indigenous	-0.2190***	(0.041)
Chinese-Origin	-0.2070***	(0.063)
Chinese x RR Building	-0.0105	(0.120)
Age 20-29	-0.0749***	(0.029)
Q1 Height	-0.0285	(0.027)
Q4 Height	-0.0492	(0.066)
Female	0.0468	(0.065)
Uses Alias	-0.0684	(0.071)
Single	0.0133	(0.036)
Other Religion	-0.0592	(0.073)
Unhealthy Complexion	0.0271	(0.047)
Stout Proportion	-0.0361	(0.039)
Small or Thin	-0.0161	(0.041)
Balding	-0.0644	(0.126)
Intemperate	0.1006***	(0.032)
Unflattering Marks	-0.0430	(0.037)
Low Skilled	-0.0442	(0.028)
Military or Police	0.3491**	(0.141)
Sailor	-0.2742***	(0.052)
Natural Resource Occupations	-0.1160*	(0.060)
Constant	-4.337***	(0.313)
Narrow Crime Class FE	Yes	
Admission Year FE	Yes	

$N = 17,470$. $R^2 = 0.131$. Restricted sample — sentences less than 7 days and more than 2 years are omitted. Standard errors in parentheses and clustered by (narrow crime class x admission year). * indicates statistical significance with 90% confidence; ** indicates statistical significance with 95% confidence; *** indicates statistical significance with 99% confidence.

Table 3: Impact of Statistical Bias: Controlling for Future Recidivism

	Baseline		Include Predicted		H_0 Equal Marginal
	Sentencing Equation		Recidivism		Effects (P-Value)
Indigenous	-0.2601***	(0.032)	-0.2184***	(0.037)	0.048**
Chinese-Origin	-0.1369***	(0.040)	-0.1060**	(0.043)	0.069*
Female	-0.1492***	(0.037)	-0.1575***	(0.037)	0.084*
Low Skilled	0.0518**	(0.021)	0.0547***	(0.021)	0.076*
Sailor	-0.0660**	(0.031)	-0.0256	(0.037)	0.042**
Natural Resource Occupations	-0.0511	(0.035)			
Predicted Recidivism			0.7396**	(0.366)	
Constant	3.821***	(0.041)	3.748***	(0.052)	
Narrow Crime Class FE	Yes		Yes		
Admission Year FE	Yes		Yes		
N	17,584		17,470		
R^2	0.378		0.378		

Restricted sample — sentences less than 7 days and more than 2 years are omitted. Standard errors in parentheses and clustered by (narrow crime class x admission year). $H_0 = \chi^2$ test for equal marginal sentencing effects. * indicates statistical significance with 90% confidence; ** indicates statistical significance with 95% confidence; *** indicates statistical significance with 99% confidence.

in prison. After controlling for sailors’ low predicted future recidivism, there is no evidence of additional taste-based bias in their favour – sailors’ sentences become indistinguishable from the average prisoner.

Although less extreme, we find similar effects for Indigenous and Chinese-origin prisoners, both of whom were significantly less likely to re-offend than the average prisoner. In the case of Indigenous prisoners, controlling for their predicted future recidivism reduces the positive bias in their sentencing by almost 5.0 percentage points. For individuals of Chinese origin, we estimate a reduction in bias of over 3.0 percentage points. In contrast, for women and low-skilled workers, controlling for predicted recidivism actually raises the estimated sentencing bias. Women were slightly more likely to re-offend than the average prisoner, and after controlling for this tendency, the residual taste-based bias grows. For the low-skilled, who were slightly less likely to re-offend, removing the effect of predicted recidivism raises their marginal sentence length.

The large attenuation of bias for Indigenous persons once we control for predicted future recidivism is consistent with the hypothesis that as Indigenous individuals interacted less with the settler population in BC over our period of study, the probability of their

re-offending, or perhaps the expected harm of their re-offending dropped. Rational judges would take this statistical regularity into account when assigning them shorter sentences. We emphasize that the taste-based component of bias for the Indigenous prisoners remains large and significant, and we can interpret this as evidence of persistent paternalistic attitudes towards Indigenous prisoners. Similarly, with respect to individuals of Chinese origin, we still observe weaker, but statistically significant taste-based bias once we control for predicted future recidivism. For women and low-skill workers, the absence of any strong connection to predicted recidivism means that our measure of statistical discrimination is small, and the residual taste-based bias is revealed to have been slightly more severe than the aggregate marginal sentencing effect suggests once we remove its influence.

We interpret our findings as evidence that the bias we observe in criminal sentencing in BC between 1864-1913 came from both taste-based and statistical sources. In general, the aggregate marginal sentencing effects associated with the prisoner characteristics that we focus on in this study are large, and although they are reduced when remove the effect of predicted future recidivism, the taste-based residual effects remain large. This suggests that paternalism and taste-based discrimination did clearly play some role in the differential sentences we observe between groups. However, because the magnitudes of these effects are significantly altered when we control for predicted future recidivism, we can also conclude that the rational calculus of optimal sentencing was also playing a role in BC around the turn of the twentieth century.

5 Concluding Remarks

In this paper, we study bias in criminal sentencing in British Columbia between 1864 and 1913. We first document bias across the dimensions of gender, ethnicity and social class. We find shorter sentences for women, Indigenous prisoners, and prisoners of Chinese origin, but longer sentences for those working in low-skilled occupations. We then track trends in these marginal sentencing effects over time, finding that Indigenous prisoners received shorter sentences over our entire period of study, and this bias deepened after the passage of the *Indian Act* in 1876. Low-skill workers consistently received longer sentences over 1864-1913 period. For women, the bias we observe when pooling our data is driven mainly by the years prior to the nineteenth century. By the year 1900, the bias in sentencing for women has become small but volatile. Individuals of Chinese origin also receive lower sentences on average, but this is driven by later years – specifically, after the building of the CPR. During BC’s railway building boom we observe longer sentences for Chinese prisoners.

We then employ a simple empirical test to distinguish between bias that is *taste-based* from bias that is *statistical*. Drawing on rational theories of optimal criminal sentencing, we posit that the probability of any particular prisoner re-offending in the future, their *future predicted recidivism*, should be a determinant of sentence length, and may be correlated with the prisoner’s observable characteristics. Without conditioning on this factor, we may mistakenly attribute observed aggregate sentencing bias entirely to taste-based discrimination.

When we predict future recidivism and include it as a regressor in our sentencing equations, we detect evidence of statistical discrimination, but in many cases, the initial bias we observe remains. This exercise attenuates the bias for Indigenous persons by almost 5.0 percentage points and for individuals of Chinese origin by over 3.0 percentage points. Including predicted future recidivism in our main specification exacerbates the bias we observe for both women and low-skilled workers, suggesting that taste-based and statistical discrimination worked in opposite directions.

We interpret our findings in terms of distinct incarnations of taste-based discrimination. We propose that the persistent bias we observe for women and Indigenous persons reflect paternalistic attitudes within the late nineteenth and early twentieth century judiciary in BC. In studying the trend in the sentencing bias for individuals of Chinese origin, we consider the role of racial animus, consistent with anti-Asian attitudes in British Columbia at the time. Somewhat inconsistent with previous studies, we detect taste-based bias against low-skilled workers.

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