Online Appendix for "How Much do Mandatory Minimums Matter?"

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A   Case type - who gets manipulated?

In this section, I consider whether cases that are manipulated to the 10-year mandatory minimum (MM) threshold share similar characteristics. I particularly look for whether manipulated cases have characteristics that correlate with higher sentence lengths outside of the MM or drug weight effects. This exercise is informative in two key ways. First, it shows that manipulation effects are likely subject to selection bias. This implies the inclusion of the richer sets of case controls is necessary for identifying the causal sentence length increase from drug weight manipulation. Second, it provides evidence that manipulation occurs from below the bunching point.

The basic motivation for this analysis is this: if prosecutors are systematically choosing defendants to get higher sentence lengths through manipulation, cases at the threshold may have similar bunching patterns across other observable factors that are highly correlated with sentence length. One way to think of this is that prosecutors might manipulate weights for the defendants with the "worst" characteristics, or those that are most likely to increase a defendant's sentence length. Thus, I consider how charging weight correlates with six factors strongly associated with higher sentences: criminal history points, whether a gun was involved in the crime, the number of counts a defendant is charged with, whether the case went to trial, whether the defendant is female, and whether the safety valve provision was applied at sentencing. I graph these factors against charging weight for the cases with the highest bunching effects - cocaine, crack, and marijuana cases for Black and Hispanic defendants.

Figure A.1 presents the results. The figure shows significant selection effects across each of these factors. The mean at the MM threshold is a significant outlier compared to other charging weights: for criminal history the bunch mean is 54.9% higher than the non-bunch mean, 158.9% higher for gun involvement, 41.3% higher for number of counts, 167.8% higher for trial, 40.3% lower for female, and 41.9% lower for safety valve. Each of these variables are positively correlated with sentence length besides female and safety valve, which are negatively correlated. Each of these bunching or dipping results suggest manipulation occurs for the cases that are already likely to receive higher sentence lengths.

Figure A.1: Factors being selected on
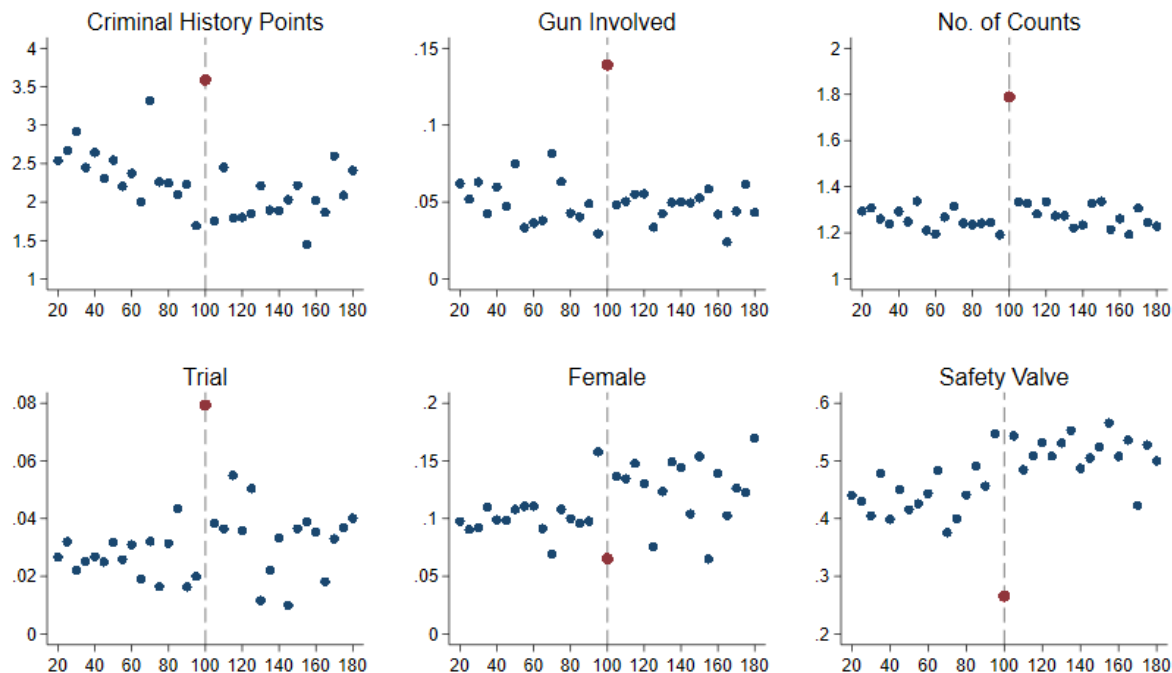
Notes: Each graph displays a different key variable measured across drug weight as a percentage of the threshold weight. These are shown in 5% bins, except at the threshold weight which only contains cases charged exactly at the threshold weight. Each variable has a strong, positive correlation with sentence length except for whether the defendant is female or receives the safety valve provision, which correlate negatively. The point at the threshold is a different color and size to highlight its difference compared to other charging weights.

The first takeaway from this analysis is not particularly surprising - that the manipulation effect is likely biased upward. Indeed, in the main paper I note the presence of missing sentence lengths in several of the discontinuity analyses[1]. This provides evidence that prosecutors manipulate cases with relatively high average sentences. These significant deviations in sentence trends only appear for cases in which the manipulation effect is present and large. Specifically, the regression analysis for heroin cases and for Black and Hispanic cases, given respectively in Figure A.3 and Figure 4 in the main text, show significantly lower sentence lengths for cases between 95% and 99% of the threshold weight. The above graphs corroborate this idea and suggest the raw manipulation effect is not to be interpreted as causal. It

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[1]Here, missing sentence length refers to dips in sentence lengths that are obviously outside of the trend. This is analogous to a missing mass in a traditional bunching design

is worth noting that the manipulation effect shrinks, but is still significantly positive, when controlling for these six factors.

The second takeaway from Figure A.1 is the direction of manipulation. The bunching (dipping) of these high (low) sentence factors is consistent with the idea that prosecutors or other legal actors manipulate cases from below the 10-year MM threshold to the threshold weight to secure a higher sentence length. If bunching was due purely to round number convenience, these factors would exhibit bunching at other round numbers in the distribution, which they do not. Upward manipulation is further evidenced by the presence of missing sentence lengths below the threshold weight, as shown in Figure 3 in the main text. This direction of manipulation is important for identification, as it suggests that extrapolation from the right-hand side is not necessarily[2]. It also suggests that if selection bias is mitigated with controls, the right-hand side sentence lengths serve as a reasonable counterfactual for sentence without manipulation.

The mechanism driving these types of cases to the bunching point is not entirely clear. If manipulation is driven by prosecutor discretion as suggested in Lynch (2016), and prosecutors are selecting cases to be manipulated upward, the cases most likely to be manipulated are those that either have low cost to manipulation, or high benefit for achieving the 10-year MM threshold (likely through higher sentence lengths).[3] Each of these channels are plausible. Cooper (2023) provides evidence that prosecutors tend to bunch more when costs to bunching are reduced. Likewise, high sentence factors may correlate with manipulation costs, such that these defendants are easier to connect to a criminal conspiracy. Indeed, a simple OLS regression finds that each of these factors correlate strongly with conspiracy except for gun use, which moves in the opposite direction. However, the presence of the manipulation effect, which survives controls, suggests there is an expected sentence length premium to prosecutors for manipulating a marginal case. Without more granular data on evidence and case connection, disentangling these two mechanisms is difficult.

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[2]This is why in the main intensive margin analysis, extrapolation from the right-hand side is only across 5 percentage points compared to 30 percentage points from the left

[3]Note that this assumes that prosecutors generally prefer higher sentence lengths to lower ones. This may not be true in every case, but it is not inconsistent with proposed models, whether prosecutors seek to minimize errors, maximize convictions, maximize sentence lengths, or some combination of these. See Landes (1971), Grossman and Katz (1983), and Silveira (2017).

B   Additional tables

Table A.1: US Attorney Data - Summary Statistics

	mean	sd
number of US attorneys per district	3.168	(0.905)
months served	48.28	(26.40)
number of cases	134.2	(150.9)
bunching propensity measure	9.750	(12.84)
max bunching propensity within district	16.41	(15.05)
min bunching propensity within district	2.752	(2.822)
# of Attorneys		282

Notes: This table considers characteristics of the US Attorneys data set. Note that number of cases only includes drug trafficking cases with weights between 50% and 150% of the threshold weight; many more cases are prosecuted during an Attorney's tenure. The propensity measures are residualized on district and year, and can be thought of as the proportion of cases during an Attorney's tenure that are charged at the threshold weight.

Table A.2: Intensive margin effects - drug type comparison

	(1) cocaine	(2) crack	(3) heroin	(4) marijuana	(5) meth
legal effect	15.00	9.873	15.65	12.51	15.51
left side 95% CI	[-6.26, 1.90]	[3.86, 18.28]	[-8.02, 4.08]	[7.87, 14.99]	[-8.05, 1.89]
right side 95% CI	[8.98, 17.02]	[13.42, 29.02]	[8.26, 19.30]	[18.19, 30.16]	[7.74, 17.33]
manip. effect	14.43	2.181	15.19	5.430	-1.474
fitted mean at 99%	-0.157	12.56	-1.276	14.57	-1.716
fit value	70%	70%	70%	70%	70%
N of obs fit on	5865	5233	3035	5256	4272

Notes: The dependant variable is sentence length residualized against criminal history points and race. All specifications are discontinuities based on local linear fits. 95% confidence intervals are presented for each fit regression on either side of the cutoff. These are calculated using the standard error of the predicted expected value, and significance is determined as no overlaps between these two intervals. The legal effect is the regression discontinuity between the two extrapolated fits at the 10-year MM cutoff. The manipulation effect is the difference between the right-hand regression fit and the actual sentence length at the threshold weight. Fit value represents the cutoff for where extrapolation begins. In this case, all specifications have left-hand regressions fit on cases with weights between 20% and 70% of the threshold weight, with extrapolation occurring from 71% up to the cutoff.

Table A.3: Intensive margin effects - criminal history and safety valve

	(1) no prior history	(2) low history	(3) no safety valve	(4) yes safety valve
legal effect	6.708	10.46	16.11	5.397
left side 95% CI	[1.41, 7.12]	[-2.16, 3.53]	[-3.79, 2.88]	[0.84, 3.43]
right side 95% CI	[8.11, 14.16]	[8.38, 14.25]	[13.01, 18.69]	[6.30, 9.04]
bunch effect	9.830	11.21	11.93	-5.984
fitted mean at 99%	4.26	0.68	2.14	2.61
fit value	70%	70%	70%	70%
N of obs fit on	3395	6828	16314	7197

Notes: The dependant variable is sentence length residualized against criminal history points and race. All specifications are discontinuities based on local linear fits. 95% confidence intervals are presented for each fit regression on either side of the cutoff. These are calculated using the standard error of the predicted expected value, and significance is determined as no overlaps between these two intervals. The legal effect is the regression discontinuity between the two extrapolated fits at the 10-year MM cutoff. The manipulation effect is the difference between the right-hand regression fit and the actual sentence length at the threshold weight. Fit value represents the cutoff for where extrapolation begins. In this case, all specifications have left-hand regressions fit on cases with weights between 20% and 70% of the threshold weight, with extrapolation occurring from 71% up to the cutoff.

Table A.4: Prosecutor analysis - racial disparity in sentence length

	(1)	(2)	(3)	(4)	(5)	(6)
Black	14.35***	13.73***	14.35***	15.18***	14.37***	12.84***
	(2.698)	(2.954)	(3.684)	(2.451)	(2.520)	(3.026)
Hispanic	4.454***	4.919***	6.063***	6.080***	6.433***	6.416***
	(1.577)	(1.758)	(2.065)	(1.610)	(1.799)	(2.094)
bunching propensity	-0.0807	0.548	1.179	0.226	0.847	1.232
	(1.033)	(1.244)	(1.245)	(1.111)	(1.361)	(1.393)
Black*bunching propensity	0.424**	0.411**	0.400**	0.0829	0.0965	0.455**
	(0.163)	(0.184)	(0.187)	(0.162)	(0.160)	(0.182)
Hispanic*bunching propensity	0.321***	0.283***	0.385***	-0.0424	-0.0498	0.200
	(0.0817)	(0.0935)	(0.140)	(0.113)	(0.126)	(0.176)
Includes Bunching Point	yes	yes	yes	no	no	no
Attorney # of Cases	All	≥ 25	≥ 50	All	≥ 25	≥ 50
R Squared	0.309	0.314	0.316	0.347	0.353	0.355
N	12210	10927	8553	11040	9889	7825

Notes: The dependant variable is sentence length at disposition. All specifications include the full set of controls; defendant characteristics, the percentage of cases with a White defendant per US Attorney, and time and district fixed effects. The first three specifications include the bunching point while columns 4-6 omit all cases at the bunching point. This tests whether disparities in sentence length between races is driven by drug weight manipulation. Standard errors are clustered at the district level.

Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Discontinuity analysis with multiple drug weight controls

	(1) All cases	(2) Black	(3) Hispanic	(4) White
legal effect	9.520	11.86	10.18	11.02
left side 95% CI	[1.63, 5.64]	[2.60, 11.07]	[0.54, 4.97]	[-6.01, 2.01]
right side 95% CI	[11.65, 15.11]	[14.72, 23.23]	[10.89, 15.16]	[6.09, 12.42]
manip. effect	5.573	3.665	3.856	-2.249
fit value	70%	70%	70%	70%
N of obs on fit	33691	11205	15296	7190

Notes: The dependant variable is residual sentence length. All specifications include controls for defendant characteristics, time and district fixed effects, and the new other drug type weight controls. These are weight as a percent of the 10-year mandatory minimum threshold for up to 4 other drug types other than the primary type. Each specification is fit at 70%.

Table A.6: Discontinuity analysis with weight range observations included

	(1) sentence length	(2) resid sent 1	(3) resid sent 2	(4) resid sent 3
Panel A: Minimum of Weight Range				
legal effect	9.467	13.00	9.192	11.02
left side 95% CI	[71.70, 76.97]	[-4.43, 0.11]	[-5.05, -0.84]	[-1.84, 2.19]
right side 95% CI	[81.55, 86.20]	[8.86, 12.96]	[4.37, 8.09]	[9.52, 13.03]
	{33911}	{33911}	{33911}	{33911}
manip. effect	15.20	7.156	12.38	5.319
Panel B: Median of Weight Range				
legal effect	13.69	11.68	10.91	11.09
left side 95% CI	[68.19, 73.37]	[-1.40, 3.077]	[-5.90, -1.76]	[-0.67, 3.26]
right side 95% CI	[82.19, 86.81]	[10.56, 14.64]	[5.15, 8.86]	[10.71, 14.21]
	{33546}	{33546}	{33546}	{33546}
manip. effect	16.02	14.79	5.372	8.309
Panel C: Maximum of Weight Range				
legal effect	13.22	16.93	9.799	12.06
left side 95% CI	[67.44, 72.39]	[-6.69, -2.42]	[-6.32, -2.40]	[-1.78, 1.94]
right side 95% CI	[80.86, 85.51]	[10.37, 14.47]	[3.52, 7.25]	[10.44, 13.97]
	{33546}	{33546}	{33546}	{33546}
manip. effect	11.37	6.788	6.706	3.471
fit value	70%	70%	70%	70%
baseline controls	no	yes	yes	yes
additional controls	no	no	yes	yes
fixed effects	no	no	no	yes

Notes: This table gives the regression discontinuity results for the full sample of cases including cases with imprecise weight measures. For each measure, I use the precise weight for cases where it is available and then vary how the range measure is considered. In Panel A, I use the minimum value of the range as the drug weight measure. In Panel B, I use the median of the drug weight range. And in Panel C, I use the maximum weight in the drug range. The four specifications use the same control schemes as used in the main analysis. All regressions are fit at 70% of the threshold weight and use a linear fit. Sample size is given in curly braces.

Table A.7: Prosecutor Analysis - Omitting High and Low Case-per-month Attorneys

	(1) bunch	(2) sent. length	(3) bunch	(4) sent. length
Black	-0.0244*	14.82***	-0.0194	14.48***
	(0.0123)	(2.857)	(0.0124)	(2.569)
Hispanic	-0.0194**	4.270**	-0.0171*	4.525**
	(0.00961)	(1.900)	(0.00932)	(1.895)
bunch_score	-0.00119	-0.292*	0.000389	-0.172
	(0.00146)	(0.148)	(0.00147)	(0.115)
Black*bunch_score	0.00369***	0.303**	0.00296**	0.276**
	(0.00116)	(0.138)	(0.00123)	(0.120)
Hispanic*bunch_score	0.00156**	0.294***	0.00115	0.213**
	(0.000769)	(0.0942)	(0.000767)	(0.0857)
Attorney Cases per Month	≥ 0.5	≥ 0.5	≤ 9	≤ 9
R Squared	0.191	0.316	0.192	0.311
N	11190	11190	10701	10701

Notes: All specifications include the full set of controls; defendant characteristics and time and district fixed effects. The first two specifications omit US Attorney spell cases with the bottom 10 percent of cases per month. Columns 3 and 4 omit the top 10 percent. Note that this is different than the sample restrictions in the main specifications - there I omit attorneys who see very few cases total which removes several attorneys who only served for a short amount of time. In this analysis I omit attorneys on a cases-per-month basis which may keep short-term attorneys if they fall within the assigned ranges.
Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table A.8:** Racial Disparity in Sentence Length using a Binary Measure

	(1)	(2)	(3)	(4)	(5)	(6)
Black	12.82**	13.10**	16.73*	15.55***	14.63***	13.86***
	(5.100)	(5.737)	(8.715)	(2.411)	(2.554)	(3.166)
Hispanic	2.189	2.024	2.627	4.495***	5.127***	5.186***
	(2.450)	(2.347)	(2.545)	(1.483)	(1.575)	(1.845)
bunching binary	-4.588	-5.023	-6.645	-3.871	-2.920	-6.103
	(5.102)	(5.875)	(8.668)	(3.277)	(3.660)	(4.514)
Black*bunching binary	6.140	5.148	1.185	5.355	5.560	7.776*
	(5.102)	(5.875)	(8.668)	(3.606)	(3.821)	(4.597)
Hispanic*bunching binary	5.476**	5.860**	7.424**	5.243*	4.166	8.176**
	(2.734)	(2.714)	(2.998)	(2.991)	(3.296)	(3.950)
Binary Measure Used	1	1	1	2	2	2
Attorney # of Cases	All	≥ 25	≥ 50	All	≥ 25	≥ 50
R Squared	0.309	0.314	0.316	0.347	0.353	0.354
N	12,210	10,927	8,553	11,040	9,889	7,825

Notes: The dependent variable is sentence length in months. The key difference from Table A.4 is the bunching propensity score measure is now a binary variable rather than a continuous one. I also only consider the case where the bunching point is included (versions with excluded bunching point available upon request). I use two different measures to determine which US Attorney spells count as a bunching spell - one which follows a simplified version of Frandsen (2017) and one which simply takes the top 50% of spells according to the main continuous measure used. All specifications contain the full set of controls. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
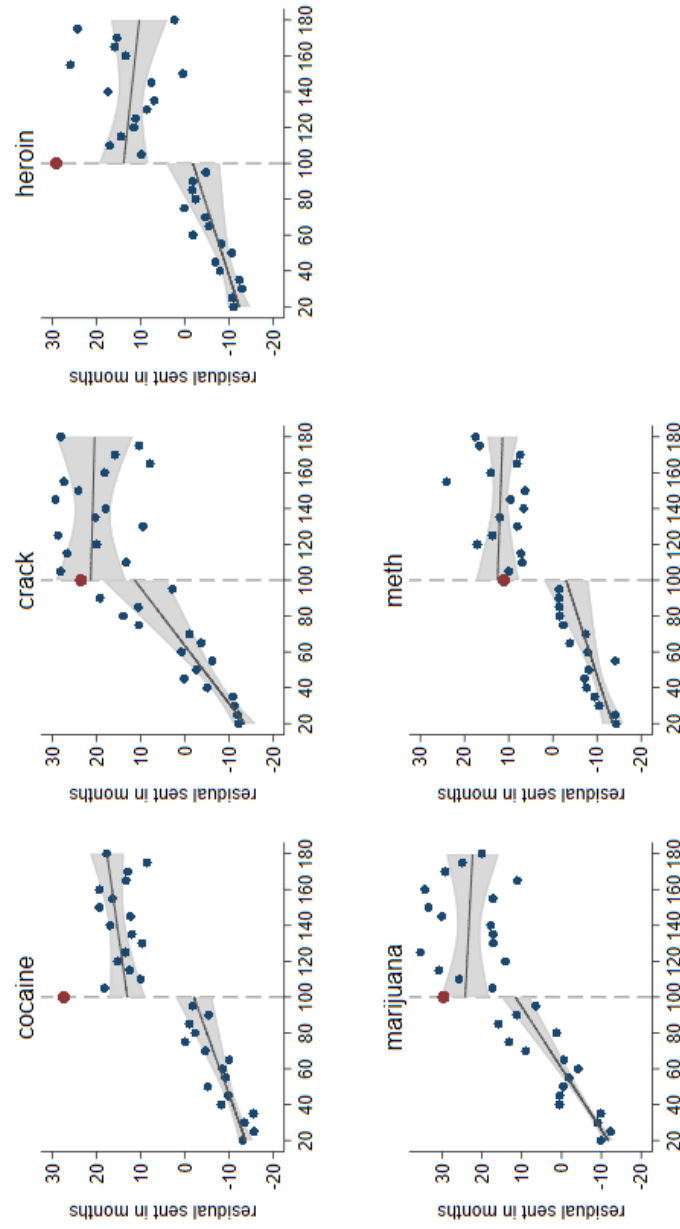
C   Additional figures

**Figure A.2:** Percent of Cases Bunched by District
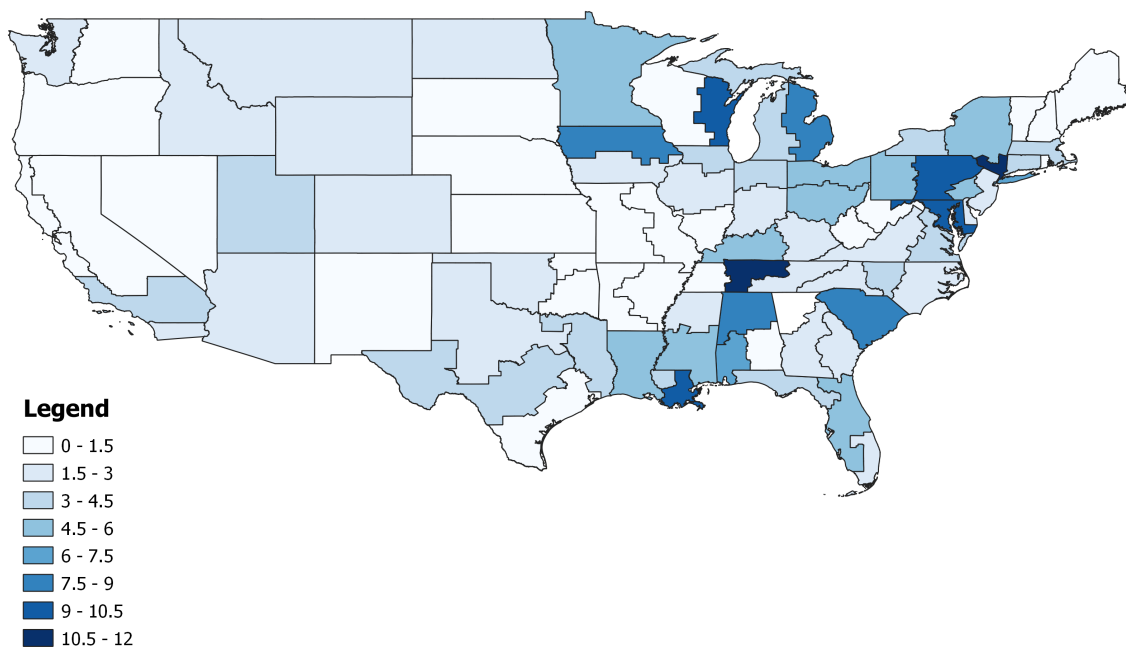
Notes: This figure shows variation in bunching propensity across district. It presents the percent of cases bunched for all cases before December of 2018 across each district.

Figure A.3: Main results by drug type

Notes: This figure illustrates the regression discontinuity design controlling for race and criminal history points, fit at 70% for each drug type. Data at the bunching point is larger and with a different color simply to emphasize differences in manipulation effects between drug types.

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Figure A.4: Main results by criminal history group
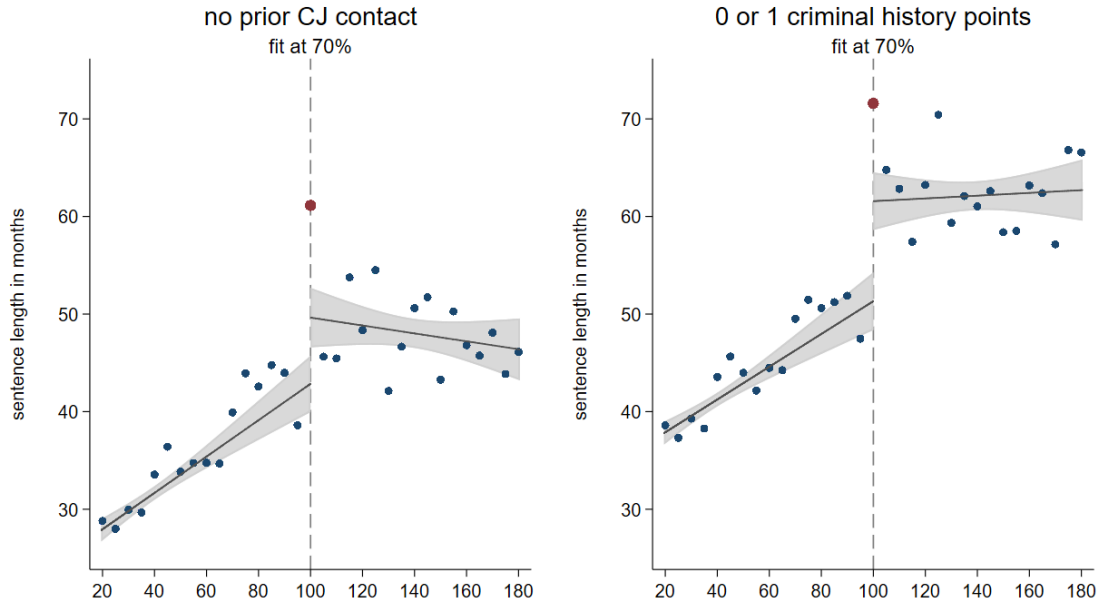
Notes: These are the main regression discontinuity results for cases in the first two criminal history categories, generally considered low-history defendants. Group 1 includes only defendants who have had no previous encounters with the criminal justice system, including events that would lead to zero criminal history points, such as arrest. Group 2 includes individuals who have no points but have had some encounters with the justice system, and individuals with one point. Both discontinuities are fit using the 70% cutoff for extrapolation and use linear fits.

Online Appendix References

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