The Long-term Incarceration Consequences of Coming-of-Age in a Crime Boom

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Abstract: We examine the relationship between incarceration rates birth-year cohorts experience in their thirties and the crime conditions they experienced throughout their youth. We find that birth-year cohorts who experienced higher crime during adolescence had substantially higher incarceration rates in their thirties than birth-year cohorts in the same state who experienced lower crime during adolescence. By contrast, the crime rates birth-year cohorts experienced during their late teens and early twenties have little relationship with their incarceration rates in their thirties. Given crime peaked in the mid-1990s, our results suggest a falling prison population even in the absence of large-scale sentencing reforms.

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I - Introduction

One of the most notable trends in the United States over the last forty years has been that after a relatively long period of increasingly high crime rates across much of the country, these rates peaked in the mid-1990s, and subsequently have fallen dramatically in almost all states. Given these large changes in crime rates over time, within any given state, youth of different ages experienced very different crime conditions during childhood and early adulthood. We are interested in assessing how such differential crime conditions individuals were exposed to while growing up relates to their long-term connections to the criminal justice system.

We think there are a couple of mechanisms through which the crime environment individuals face while growing up may impact their involvement in the criminal justice system during mid-adulthood. For one, individuals who grow up during a time of high-crime may be more likely to be pulled into criminal activity via learning criminogenic skills, seeing crime as normalized behavior, and/or experiencing the trauma of themselves or loved ones being victimized, which then cause them to become more intensely involved in criminal activity throughout their lives (Hagan 1993; Glaeser et al. 1996; Loughran et al. 2013). In the language of the state-dependence literature (Heckman 1981), some youth experience different structural conditions with respect to crime growing up, which causes them to be more prone to crime themselves throughout their lives. Second, local policing and criminal justice may have become more aggressive in the wake of a high-crime period, causing youth who came of age during such periods to potentially face larger consequences for any contact with the criminal justice system throughout their life course, even after the crime boom is over (King 2019). These issues may mean that those individuals who grow up during a high-crime environment develop stronger ties to the criminal justice system, which could potentially provide obstacles to joining the legal economy during adulthood, as well as lead to more severe sentencing for any given criminal activity later in life. Overall, these mechanisms could cause such individuals to continue to maintain stronger connections to the prison system well into adulthood.

To examine these issues, we exploit the fact that different birth cohorts in the same state faced different crime conditions over the course of their youth and early adulthood. Therefore, we can assess the extent to which individuals who faced high-crime conditions in their state during adolescence, teen years, and/or early adulthood end up with higher incarceration rates

during their early thirties than individuals from the same state who grew up with lower crime conditions because they came of age at a different time.

Our results are somewhat surprising. While we find some evidence that the crime conditions cohorts face in their late twenties is related to their incarceration rates in their early thirties, these results are relatively imprecisely estimated. Interestingly, however, we find an arguably stronger, positive relationship between the crime conditions a state/birth-year cohort faced between the ages of 11 and 15 (what we refer to as *adolescence*) and incarceration rates for these cohorts throughout their early thirties. This result is robust across a variety of states and holds when controlling for the unemployment rate that prevailed while the cohort was growing up. However, we find no evidence that cohorts who faced higher crime conditions in their late teens and early twenties had higher incarceration rates in their early thirties.

This result that birth-year cohorts who faced high-crime conditions during adolescence have significantly higher incarceration rates during their early to mid-thirties appears to arise not only because individuals in these cohorts are more prone to be serving incarceration sentences that began prior to their thirties than other cohorts, but also because they are more prone to begin incarceration spells in their early thirties than other cohorts. In other words, there are both stock and flow components driving our results. Once again though, conditional on the crime experienced in adolescence, there is little evidence to suggest that those cohorts who experienced high-crime conditions in their later teens or early twenties were more prone to begin new incarceration spells in their early thirties than other cohorts.

These findings can potentially help explain two notable trends in incarceration over the past 30 years. First, the prison population has been steadily aging (Luallen and King 2014; Porter et al. 2016; Carson and Sabol 2016), and second, the number of juvenile arrests has been steadily falling (Puzzanchera 2020). Given our results, one of the underlying forces leading to both of these trends may be that individuals who were adolescents in the high crime period of early to mid-1990s have had sustained contact with the criminal justice system throughout their early to mid-adulthoods, while individuals who hit adolescence in the lower crime era of post-2000 America have become much less likely to become involved in the criminal justice system throughout their youth and early adulthood.

Finally, one of the key implications of our findings is that given the downward trend in crime rates that began in the mid-1990s, the United States should start to see decreases in

incarceration, particularly among older individuals, even in the absence of large sentencing reforms.

II - Related Literature

This paper is somewhat similar in spirit to Bell, Bindler, and Machin (2018), who look at how the labor market conditions prevalent at the beginning of an individual's working life impact later life criminal activity. They find that "young people who leave school in the midst of recessions are significantly more likely to lead a life of crime than those entering a buoyant labor market" (Bell, Bindler, and Machin 2018, p 393).

Like Bell, Bindler, and Machin (2018), our study also exploits panel data on year-of-birth cohorts across states and time to examine how local environmental conditions cohorts face at one point in their life may have long-term impacts on later life criminality related outcomes. Like in their paper, identification of these impacts in our paper comes from within-cohort variation in environment across states and across-cohort variation in environment within state. However, in contrast to Bell, Bindler, and Machin (2018) who look at the impact of local employment conditions faced by cohorts at the time they enter the work world and the subsequent years thereafter on later-life criminality related outcomes, this paper considers the impact of crime conditions faced by cohorts from adolescence through their twenties on later-life criminality related outcomes.

Also of import, while the criminality outcome of interest in Bell, Bindler, and Machin (2018) is arrest rates among state-birth year cohorts throughout adulthood, the criminality outcome of interest in this paper is incarceration rates among state-birth year cohorts in their early thirties. While arrest rates obviously indicate new crimes being committed, the incarceration rate of a given cohort when they are in their early thirties is a byproduct of both sentences being served for recently committed crimes, but also for crimes committed earlier in life (both through long-term sentences or a higher likelihood of incarceration for current convictions due to earlier convictions).

This paper also builds on the literature that reveals how the circumstances individuals face during adolescence and early adulthood can have long-term consequences with respect to criminal activity. Maybe most notably, in examining the results of the Moving-to-Opportunity experiment, Chetty, Hendren, and Katz (2016) show that among kids who started life in high-

poverty high-crime neighborhoods, those who moved to lower-poverty lower-crime neighborhoods (due to their family being randomly allocated a specialized housing voucher) were more likely to attend college and had higher earnings throughout their twenties than those who stayed, but only if they moved prior to adolescence. This suggests that even if individuals face a less chaotic environment in their later teen years, this may not be sufficient to overcome the influence of what they faced during childhood and adolescence.

Finally, this work also builds on the literature that examines how incarceration rates among different cohorts evolve over time. For example, Porter et al. (2016) describe how birth-cohorts with high levels of incarceration at young adult ages contributed disproportionately to the prison population at older ages as well. Similarly, Shen et al. (2020) look at how incarceration rates for different birth-year cohorts in the state of North Carolina evolve over time. They find that while incarceration rates did seem to be impacted by policy changes over time, these impacts are modest when compared to differences in incarceration rates across birth-year cohorts over the course of their adult years.

Neil and Sampson (2021) also examine cross cohort differences, but look at arrests over the life-course for a sample of three Chicago youth cohorts born in 1980, 1985, and 1995. They find notable differences in yearly arrest probabilities across cohorts, with these differences in arrest probabilities emerging around the age of 15, peaking around the age of 18, with the yearly arrest rate decreasing in cohort birth year. They also show that the neighborhood crime conditions these cohorts experienced between the ages 6 and 11 differed substantially across cohorts, with the earlier birth year cohorts being exposed to much higher neighborhood violence during these adolescent years. Similarly, Fabio et al. (2006) look at variation in self-reported violent behavior over a fourteen-year period among three cohorts of Pittsburgh public school youth who were in first, fourth, and seventh grade in 1987. These authors also find higher level of violence among the more recent birth cohort that is already noticeable at age 12 (the first age they are able to do such a comparison) and persists through age 20 (the last age they are able to look at).

This study builds on this work by not only looking at cross-cohort differences in incarceration rates across several states, but by specifically tying cohort differences in incarceration rates when these cohorts reach their early thirties to the crime conditions these cohorts faced in their states from adolescence through their twenties.

III - Data

Our incarceration data comes from the National Corrections Reporting Program (NCRP). This data is collected under the auspices of the United States Department of Justice's Bureau of Justice Statistics (United States Department of Justice 2016). The data we use covers the period from 2000-2014 (ICPSR 2016). The unit of observation in the data is individual prison terms. Each prison term record includes the key variables of prison admission date, prison release date (if applicable), state of incarceration, birth year of prisoner, and gender of prisoner. For this analysis, we analyze male prisoners only. With the above variables, we can calculate whether each prisoner is incarcerated at any given age. Therefore, we can also calculate the number of individuals of a given birth-year cohort who are incarcerated at any given age in each state. For example, we can calculate the number of individuals born in 1970 who are incarcerated at the age of 30 in New York. Given the analysis will look at incarceration rates among a state/birth year cohort at the ages of 30 to 34 (namely the number incarcerated at ages 30, 31, 32, 33, and 34 per hundred thousand births for that state/birth year cohort), and our incarceration data covers the years 2000-2014, we analyze cohorts born between 1970 and 1979.

An important issue that arises with the NCRP data is that for many states the data is not complete. Reporting is voluntary and submitted by individual state's Departments of Correction. Data for many states is clearly missing in some years, and some states it is clear that while data are reported, such data is incomplete. However, there is no variable in the NCRP indicating whether or not the data is complete for a given state.

Given these issues, we use the following criteria to determine whether a state should be included in our sample. First, we exclude any states that report fewer than 100 prisoners in any given year between 2000 and 2014, as it is clear that this implies substantial undercounting. Second, we exclude any state that experienced a greater than 10 percent increase in its prison between any two consecutive years between 2000 and 2014, as such rapid prison population growth between two consecutive years suggests some prisons are reporting data in some years but not others.

The above exclusion criteria leave seventeen states. The first column of Table 1 shows these seventeen states, with the second column showing the average number of incarcerated 30 year-old males per one-hundred thousand male births for cohorts born between 1970 and 1979

(rates are very similar if we look at incarcerations of 31, 32, 33, and 34 year-olds). As can be seen, there is also a good deal of variance in these age 30 incarceration rates across states. For example, in Florida and Georgia, across the birth cohorts examined here, there is an average of over 4800 incarcerated 30 year-old individuals per 100 thousand births. By contrast, in Nebraska and Utah, there are less than 1500 incarcerated 30 year-old individuals per 100 thousand births. Accounting for these fixed differences across states will be important in the empirical work to follow.

Our second key data are state-by-year crime rates coming from Federal Bureau of Investigation's Uniform Crime Reports, specifically the estimates coming from the State Reporting System. This data contains estimated populations and crime incidence rates for Index crimes by state beginning in 1979. We use this data to calculate the average crime rate (i.e., crimes per 100,000 persons) that each state/birth-year cohort experienced over four different age ranges: 11-15, 16-20, 21-25, and 26-30. We do this for all Index crimes, as well as separately for violent crimes (murder, rape, robbery, assault) and property crimes (burglary, larceny, motor vehicle theft).

To calculate the size of each state/birth-year cohort, we use the National Vital Statistics birth records data from the Centers for Disease Control. Public versions of this data commence with the 1968 birth cohort. Obviously, the individuals born in a given year in a given state will not all stay in that state their whole life. However, we think births in a given state in a given year will give a reasonable measure of relative size of each cohort in each throughout the years.

Finally, we use data from the Bureau of Labor Statistics starting in 1980 to compute the average unemployment rates each state/birth-year cohort experienced during the four age ranges alluded to above.

IV - Methodology

Intuitively, our basic approach is to compare incarceration rates (both stock and flow) at the ages of 30, 31, 32, 33, and 34 across birth-year cohorts within each state in our sample, and analyze the extent to which variation in such rates is correlated with the crime rates each cohort experienced at different ages earlier in their lives. This means that for our methodology to have any promise there must be a reasonable amount of within state variation in the crime rates each cohort experienced while growing up.

The rightward columns of Table 1 show the minimum and the maximum crime rate (defined as crimes per 100,000 population) at each age range across the ten cohorts for each of the seventeen states in our sample. As can be seen, the dramatic changes in crime from the 1980s through the 2000s means that there is quite a bit of variation in the crime rates experienced while growing up across these ten birth cohorts within each state. For example, looking at Colorado, the crime rate experienced by 11-15 year-olds was nineteen percent higher for the cohort that experienced the most crime during those ages compared to the cohort that experienced the least during those ages. Similarly, the crime rate experienced by Colorado16-20 year-olds was thirty-four percent higher for the cohort that experienced the most crime during those ages compared to the cohort that experienced the least during those ages. For the most part, the other states show similar within age range variation across cohorts.

The particular methodology we employ is to estimate OLS regressions of the following form:

$$(1) \qquad E\left[Incarceration\ Rate\ Age\ X_{i,S}\right] = \alpha + \sum_{a=1}^{4} (\beta_a CrimeRt_{\ i,S,a} + \delta_a UnempRt_{\ i,S,a}) + \rho_S + \varphi_i,$$

where, in our primary specifications, *Incarceration Rate Age* $X_{i,s}$ is the number of male individuals from cohort *i* in state *S* incarcerated at the age of X per 100,000 male members of that cohort (as measured by the number of births associated with that cohort in that state) where X ranges from 30 to 34, $CrimeRt_{i,S,a}$ is the mean crime rate experienced by cohort *i* in state *S* while in age range *a*, $UnempRt_{i,S,a}$ is the mean unemployment rate experienced by cohort *i* in state *S* while in age range *a*, ρ_S capture state fixed-effects, and φ_i capture birth cohort fixed-effects. Age range 1 corresponds to ages 11-15, age range 2 corresponds to ages 16-20, age range 3 corresponds to ages 21-25, and age range 4 corresponds to ages 26-30.

As discussed above, controlling for state fixed-effects is important since the mean incarceration rates at the ages of 30-34 across cohorts vary substantially across states. Similarly, controlling for cohort fixed-effects is important as it is well known there were substantial aggregate changes in crime over the whole United States over the course of the early-1980s through the 2000s, which is the time in which the cohorts in our sample would be growing up.

Finally, controlling for unemployment rates experienced at different ages aims to capture the economic conditions each cohort faced in their state of birth at different ages.

We estimate equation (1) separately for each age of incarceration from 30 to 34. Also, in addition to using overall crime rates experienced during each age range as the key right-hand side variables as shown above, we separately estimate equation (1) using the violent crime rates experienced during each age range, as well as the property crime rates experienced during each age range. Finally, we estimate equation (1) using incarceration rates at each age from 30 to 34 as the dependent variable, but also new prison admission rates at each age between 30 and 34 as the dependent variable.

V – Main Results

Figure 1 reveals the main patterns of interest in a simple way. The bars in Figure 1 show the mean incarceration rate among 30 year-olds by birth-year cohort averaged across states, for cohorts born between 1970 and 1979. As can be seen, on average across states, the fraction of each birth cohort that is incarcerated at age 30 was generally higher for the more recent birth cohorts than the older birth cohorts.

The lines in Figure 1 then show what is of interest for this study, which is how crime conditions at each age differed across these cohorts. Specifically, the lines in Figure 1 show the average (index) crime rates each cohort faced at the four different age rages: 11-15, 16-20, 21-25, and 26-30. Not surprisingly given the fall in crime over the 1990s and 2000s, more recent birth cohorts actually faced lower crime rates during their twenties than the older cohorts. But notably, it is also the case that these more recent cohorts faced significantly higher crime rates during adolescence (ages 11-15) than did the older cohorts.

These results shown in Figure 1 are suggestive of the arguably counter-intuitive hypothesis that part of the reason the younger cohorts have higher incarceration rates when in their thirties is because they faced higher crime conditions during adolescence than did the older cohorts. The analysis that follows attempts to assess the degree to which the above relationship is robust to controlling for unemployment rates experienced at different ages, as well as nationwide trends and general cross-state differences in incarceration rates.

The top panel of Table 2 shows the results of five separate regressions estimating β_1 though β_4 from equation (1), where each specification uses incarceration rates at a different age

between 30 and 34 as the dependent variable. As discussed earlier with respect to equation (1), all regressions also control for the unemployment rates each cohort faced during the four different age ranges, as well as state and cohort fixed-effects. The middle and bottom panels of Table 2 each show the results of five analogous regressions to those shown in the top panel, but using property crime rate experienced at different ages, and the violent crime rate experienced at different ages, as the key explanatory variables respectively.

As can be seen in the top panel of Table 2, only the crime rates experienced during the ages of 11-15 have a positive and statistically significant relationship (at the 5 percent level) with incarceration rates for cohorts when they reach their early to mid-30s (significance calculated using heteroskedastic robust standard errors clustered by state, which are shown in parentheses below coefficients). The magnitude of these coefficients are not trivial. For example, they suggest that if a cohort *A* experienced crime rates with on average 1000 more index crimes per 100,000 people during the ages 11-15 than another cohort *B* in the same state (roughly the average maximum difference across cohorts within a state as can be seen in Table 1), cohort *A* would have over 600 more incarcerated individuals per 100,000 births at each age between 30 and 34 than cohort *B*.

By contrast, the coefficients on crime rates experienced at ages 16-20 and at ages 21-25 are small in magnitude and not statistically significant at standard levels of significance. However, the magnitude of the coefficients on the crime rates experienced at the ages of 26-30 are similar in magnitude to those on the crime rates experienced at the ages of 11-16, but they are more imprecisely estimated and do not achieve standard levels of statistical significance.

The middle panel shows what happens if we just use the property crime rates experienced during different ages as the key explanatory variables rather than overall index crime rates. As can be seen, the basic relationship stays the same. The coefficient on the variable capturing the property crime rates a cohort experiences during the ages 11-15 is positive and significant at the ten percent level or higher in each specification, with the analogous coefficients on variables capturing the property crime rates experienced during ages 16-20 and 21-25 smaller in magnitude and never statistically significant. Again, the coefficients on property crimes experienced during ages 26-30 are similar in magnitude to those on property crimes experienced during ages 11-15, but never statistically significant at standard levels of significance.

Finally, the bottom panel of Table 2 looks at what happens if we use the violent crime rates experienced during different ages as the key explanatory variables rather than overall index crime rates. As can be seen, the basic relationship stays the same as those discussed above, but is much stronger in magnitude. The coefficients suggest that if a cohort *A* experienced an average of 1000 more violent crimes per 100,000 people during the ages 11-15 than another cohort *B* in the same state, cohort *A* would have roughly 5000-6000 more incarcerated individuals per 100,000 at the ages of 30, 31, 32, 33, and 34 than cohort *B*. And again, this bottom panel shows that while a cohort's incarceration rate in early middle-age is correlated with the violent crime that cohort experienced during adolescence, such incarceration rates are not correlated with the violent crime rates that cohort experienced throughout the ages 16-25. However, again there is some evidence that the violent crime rates that a cohort experienced during the second half of their 20s is related to their incarceration rates in their early thirties, though again this relationship is relatively imprecisely estimated.

VI – Robustness of Results

This section attempts to assesses the robustness of the above results. The first thing we consider is what would happen if we loosened our criteria regarding which states we use in our sample. As discussed above, because of concerns about the completeness of the NCRP data, we excluded states if they showed a greater than ten percent swing in the reported prison population between any two adjacent years. It turns out we could loosen this criterion quite substantially and it wouldn't change our sample very much. For example, if we only excluded states that showed a greater than 35 percent swing in prison population between any two adjacent years, that would only increase our sample by two states (AZ and MN). Our results change little when these states are included (results available upon request).

While our main results appear to be quite robust to alterations in sample, one still might be worried that they are driven by a particular state. To evaluate this concern, we estimate a series of regressions corresponding to the specification shown in column (1) in the top panel of Table 2, where in each successive regression we drop a different state from the sample. We show the distribution of the coefficients on the variables capturing the crime rate experienced at different ages in each iteration in Figure 2.

Each dot in each panel of Figure 2 corresponds to a regression, where the sample used to estimate each regression differs by one state each time. Figure 2a shows the coefficients on crime rate experiences during the ages 11-15, Figure 2b show the coefficients on crime rate experiences during the ages 16-20, Figure 2c show the coefficients on crime rate experiences during the ages 20-25, and Figure 2d show the coefficients on crime rate experiences during the ages 26-30.[1]

As can be seen in Figure 2a, the coefficients on the crime rate experienced during the ages 11-15 range from about 0.4 to about 0.8. By contrast, Figures 2b and 2c show that the coefficients on the crime rate experienced during the ages 16-20 and ages 21-25 almost never exceed 0.2. Figure 2d shows that the coefficients on the crime rate experienced during the ages 26-30 mostly stay in the range of 0.4 to 0.8, but they reach as high as almost 1.2 and as low as 0.27. In general, these figures reveal that the results in Table 2, particularly those with respect to the crime experiences during the ages of 11-15, are robust to small changes in the sample.

VII – Examining New Prison Admission Rates

A variety of questions arise regarding why individuals who were adolescents during high crime periods have higher incarceration rates in their thirties (see also Shen et al. 2020). Many of these questions we cannot answer at this point. However, one question we can look at is whether the higher incarceration rates experienced during their thirties among cohorts who faced higher crime rates during adolescence are simply due to such individuals serving long sentences for convictions that occurred in their teens and twenties, or whether this result is also due to such cohorts being more likely to commence new sentences in their early thirties. In other words, we can examine the extent to which the results discussed in the previous sections reflect a just a stock or also a flow issue.

To examine this, we perform a similar analysis to that done before, but instead of using incarceration rates of different birth-year cohorts during their early thirties as the dependent variable, we use new prison admission rates of different cohorts at ages during their early thirties as the dependent variable. As before, in addition to the key explanatory variables of the crime rates experienced at different ages, in all specifications we also include state and cohort fixed-effects, as well as unemployment rates experienced at different ages.

[1] This approach is similar in spirit, if not exact method, to Dugan (2002).

Table 3 shows the results from this analysis. Looking at the top panel of Table 3, we can see that the crime rates a birth cohort experienced during the ages of 11-15 is positively correlated with the new prison admission rates they experience at each different age over their early thirties, though this relationship is somewhat imprecisely estimated and seems to start to wane by the mid-thirties. Again though, there does not appear to be any significant relationship between the crime rates a cohort experienced during the late teens and early twenties and the fraction of the cohort that is admitted to a new prison sentence in their early thirties. Once again though, the coefficients on the crime rates experienced in the late twenties are similar in size to those corresponding to the crime rates experienced during adolescence, but again are quite imprecisely estimated.

The middle panel of Table 3 shows that the results are arguably quite similar when looking at the relationship between property crime rates experienced while growing up and new prison admission rates among 30 to 34 year-olds, albeit estimated with even less precision. Finally, as can be seen in the bottom panel of Table 3, the results with respect to violent crimes experienced while growing up are similar in spirit to those above, but again quite a bit more pronounced. The coefficients on the violent crime rate experienced during the ages of 11-15 and 26-30 are all positive and quite large in magnitude, though again the coefficients on the violent crime rate experienced during the ages of 11-15 are notably more precisely estimated. By contrast, the coefficients on violent crime rates experienced during late teens and early twenties are small in magnitude and rarely meet the bar for any standard levels of statistical significance.

In general, these results suggest that those cohorts who experienced higher crime rates during their adolescent years are more likely to be admitted to prison while in their early thirties than cohorts from the same state who experienced lower crime rates during adolescence. While this could be because these cohorts who experienced higher crime rates during adolescence engaged in more criminal activity in their early thirties, it could also be that these cohorts are more likely to be incarcerated for any given amount of criminal activity they engaged in during their early thirties due to more extensive criminal histories (King 2019; Shen et al. 2020).

Overall though, comparing the results shown in Table 3 to those shown in Table 2 suggests that about one-third of the relationship between the crime rates a cohort experienced while in adolescence and the cohort's subsequent incarceration rate while in their early thirties is

due to new prison admissions, implying the remaining two-thirds of this relationship arise due to sentences that commenced prior to reaching their thirties.

VIII - Conclusion

The findings of this study reveal that growing up in a high-crime environment can have long-term consequences with respect to incarceration. However, the ages at which youth are exposed to the high-crime environment are crucial and maybe not in the way one would suspect. Our results show that cohorts who faced a high-crime environment during the ages of 11-15 have substantially higher incarceration rates in their early thirties than cohorts from the same state who faced a lower-crime environment during these ages. However, maybe surprisingly, those who faced higher crime rates when they were in their later teens and early twenties do not appear to have higher incarceration rates in their early 30s than individuals from the same state who experienced lower crime rates at those ages.

Obviously, one of the big implications of these findings is that the overall criminal environment a cohort faces during adolescence can have long-run implications with respect to the connection with the criminal just system that cohort through adulthood, and indeed seems to have a much stronger impact than the criminal environment individuals face in their late teens and early twenties.

Given the large declines in crime rates in essentially every U.S. state since the mid-1990s, these results provide some optimism. Namely, they suggest that the birth cohorts that have come through adolescence throughout the 2000s may be less prone to incarceration later in life than earlier cohorts. This is important with respect to thinking about the evolution of the imprisoned population going forward. As discussed at length by Pfaff (2017), the rise in incarceration in the United States that occurred through the late 1990s and 2000s was not primarily driven by increasingly harsh punishments handed out to those convicted for non-violent drug offenses. Rather, it principally reflected more individuals convicted for violent crimes getting harsher sentences for those crimes. Hence, he suggests that more complicated and politically difficult sentencing reforms might be necessary to decrease the prison population going forward. While this may be true, the results in this paper suggest that even without such large and politically difficult reforms, the U.S. might see some notable declines in the prison population as younger cohorts who hit adolescence in a lower crime environment of the 2000s

and later might be more able to avoid incarceration later in life better than the older generations who came of age in the high-crime early 1990s.

IX – References

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Table 1 - Average Age 30 Incarceration Rate and Differences in Experienced Crime Rates Across Cohorts, by State

	Avg. Incarc.	Cohort Differencess in Annual Index Crimes/100k Population at Different Ages											
	30 yr olds per	Ages 11-14			Ages 16-20			Ages 21-25			Ages 26-30		
State	100K male births	Min	Max	%diff	Min	Max	%diff	Min	Max	%diff	Min	Max	%diff
CA	4316	6537	6908	6%	4810	6691	39%	3880	6383	65%	3556	4392	24%
CO	4120	5786	6890	19%	4743	6351	34%	4181	5655	35%	3561	4460	25%
FL	5977	7335	8721	19%	7112	8721	23%	5357	8242	54%	4704	6711	43%
GA	4804	4957	6612	33%	5743	6612	15%	4658	6221	34%	4384	5493	25%
IL	2740	5428	5818	7%	5058	5818	15%	3986	5719	43%	3473	4815	39%
KY	3291	3081	3316	8%	3143	3326	6%	2865	3326	16%	2810	3064	9%
MI	2603	5728	6608	15%	4845	6199	28%	3882	5566	43%	3570	4630	30%
MO	3829	4511	5207	15%	4885	5207	7%	4573	5207	14%	4251	4766	12%
NC	4180	4245	5691	34%	4917	5722	16%	4782	5722	20%	4453	5287	19%
NE	1399	3757	4323	15%	4086	4422	8%	4109	4422	8%	3415	4266	25%
NY	2219	5758	6233	8%	3894	6233	60%	2834	5457	93%	2431	3602	48%
OK	3921	5061	5746	14%	5286	5746	9%	4681	5522	18%	4168	5079	22%
SC	4239	4915	6004	22%	5475	6063	11%	5339	6063	14%	4964	5759	16%
SD	2256	2632	3010	14%	2714	3067	13%	2241	3067	37%	1989	2761	39%
TN	3962	4159	5183	25%	4647	5337	15%	4958	5337	8%	4801	5116	7%
UT	1240	5203	5637	8%	5493	5776	5%	4385	5776	32%	3734	5388	44%
WA	2533	6136	6826	11%	5846	6765	16%	5131	6145	20%	4527	5613	24%

Sample includes 1970-1979 birth cohorts for all states shown above.

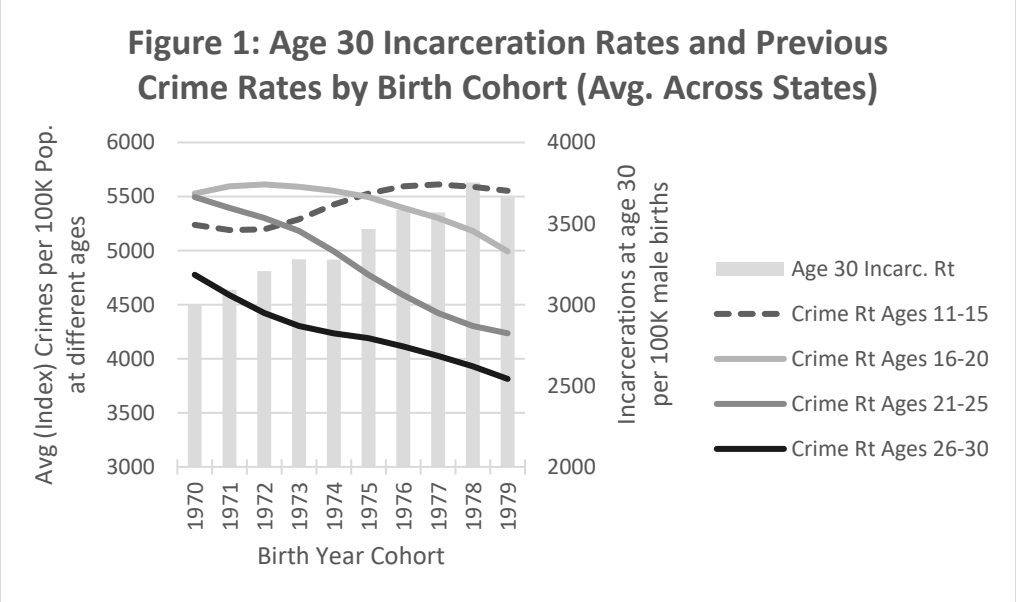
Figure 1: Age 30 Incarceration Rates and Previous Crime Rates by Birth Cohort (Avg. Across States)
Avg (Index) Crimes per 100K Pop. at different ages
6000
5500
5000
4500
4000
3500
3000
4000
3500
3000
2500
2000
Incarcerations at age 30 per 100K male births
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
Birth Year Cohort
Age 30 Incarc. Rt
Crime Rt Ages 11-15
Crime Rt Ages 16-20
Crime Rt Ages 21-25
Crime Rt Ages 26-30

Table 2: Regression Results - Later life Incarceration Rates on Early Life Crime Rates

	Dep Var: Incarcerations per 100k Male Births				
Regressors	**(1) Age 30**	**(2) Age 31**	**(3) Age 32**	**(4) Age 33**	**(5) Age 34**
Index Crimes/100k Ages 11-15	0.61**	0.66**	0.76**	0.76**	0.71**
	(0.25)	(0.27)	(0.28)	(0.30)	(0.31)
Index Crimes/100k Ages 16-20	-0.13	-0.19	-0.30	-0.35	-0.33
	(0.33)	(0.32)	(0.36)	(0.43)	(0.46)
Index Crimes/100k Ages 21-25	-0.01	-0.12	-0.22	-0.23	-0.26
	(0.37)	(0.32)	(0.26)	(0.21)	(0.24)
Index Crimes/100k Ages 26-30	0.60	0.71	0.80	0.85	0.76
	(0.42)	(0.50)	(0.55)	(0.58)	(0.60)
Prop. Crimes/100k Ages 11-15	0.58*	0.65**	0.76**	0.76**	0.71*
	(0.28)	(0.30)	(0.31)	(0.33)	(0.33)
Prop. Crimes/100k Ages 16-20	-0.07	-0.15	-0.28	-0.33	-0.29
	(0.38)	(0.37)	(0.42)	(0.50)	(0.52)
Prop. Crimes/100k Ages 21-25	0.05	-0.06	-0.17	-0.19	-0.23
	(0.45)	(0.40)	(0.33)	(0.25)	(0.26)
Prop. Crimes/100k Ages 26-30	0.54	0.66	0.80	0.86	0.76
	(0.46)	(0.54)	(0.59)	(0.62)	(0.64)
Violent Crimes/100k Ages 11-15	6.10**	5.87**	5.65**	5.03**	4.93**
	(2.11)	(2.11)	(2.12)	(1.99)	(1.73)
Violent Crimes/100k Ages 16-20	-1.35	-1.46	-1.67	-1.88	-2.29
	(1.20)	(1.16)	(1.11)	(1.32)	(1.76)
Violent Crimes/100k Ages 21-25	-0.42	-0.95	-1.13	-1.09	-1.15
	(1.10)	(1.22)	(1.44)	(1.64)	(1.72)
Violent Crimes/100k Ages 26-30	5.56**	5.30*	4.22	3.89	3.61
	(2.27)	(2.55)	(2.67)	(2.74)	(2.49)
State Fixed-Effects	yes	yes	yes	yes	yes
Birth Cohort Fixed-Effects	yes	yes	yes	yes	yes
Unemployment Rates by Age	yes	yes	yes	yes	yes
States/Obs	17/170	17/170	17/170	17/170	17/170

Robust standard errors clustered by state shown in parentheses. ***indicates significance at 1% level, ** indicates significance at 5% level, * indicates significance at 10% level.

Figure 2a: Coefficient on Crime Rt During Ages 11-15 (Omitting One State Each Time)

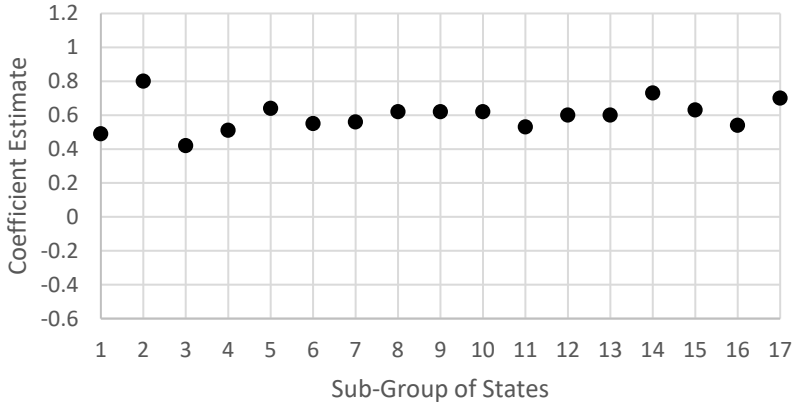

Figure 2b: Coefficient on Crime Rt During Ages 16-20 (Omitting One State Each Time)

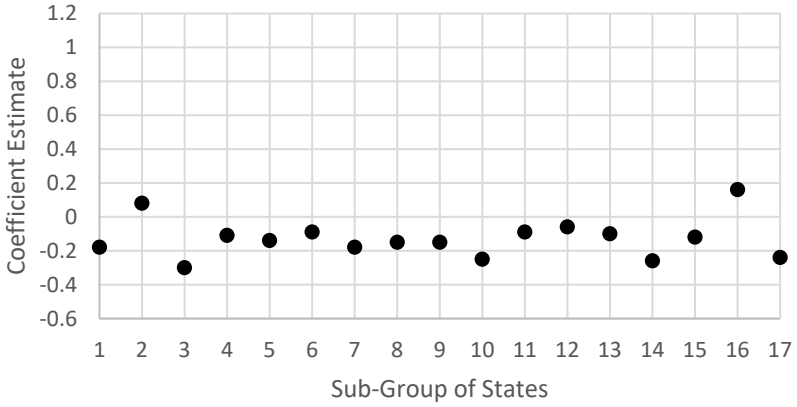

Figure 2c: Coefficient on Crime Rt During Ages 21-25 (Omitting One State Each Time)

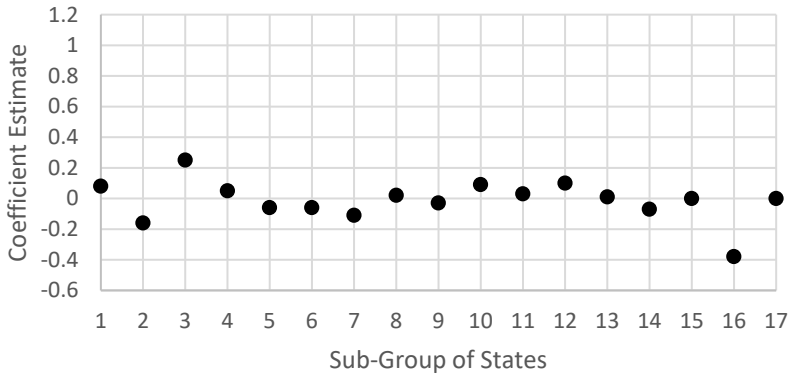

Figure 2d: Coefficient on Crime Rt During Ages 26-30 (Omitting One State Each Time)

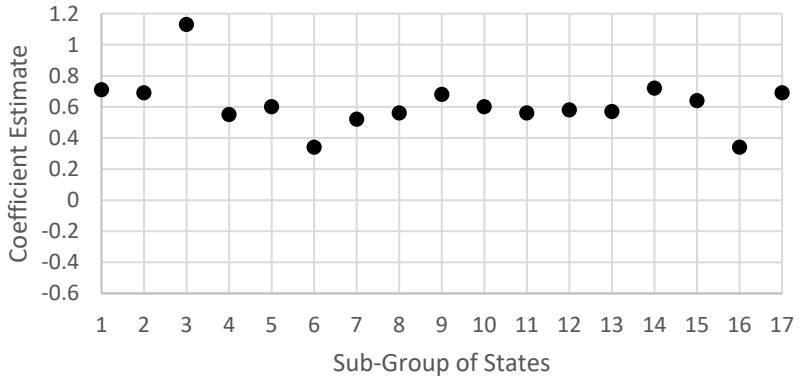

Table 3: Regression Results - New Prison Admission Rates on Early Life Crime Rates

	Dep Var: New Prison Admissions per 100k Male Births				
Regressors	**(1) Age 30**	**(2) Age 31**	**(3) Age 32**	**(4) Age 33**	**(5) Age 34**
Index Crimes/100k Ages 11-15	0.21*	0.24*	0.29**	0.22	0.18
	(0.11)	(0.13)	(0.13)	(0.13)	(0.12)
Index Crimes/100k Ages 16-20	-0.14	-0.16	-0.18	-0.13	-0.13
	(0.16)	(0.16)	(0.19)	(0.21)	(0.19)
Index Crimes/100k Ages 21-25	0.11	-0.01	-0.10	-0.08	-0.06
	(0.15)	(0.10)	(0.09)	(0.10)	(0.13)
Index Crimes/100k Ages 26-30	0.21	0.33	0.44	0.42	0.27
	(0.23)	(0.26)	(0.27)	(0.26)	(0.26)
Prop. Crimes/100k Ages 11-15	0.20	0.23	0.29*	0.22	0.17
	(0.12)	(0.14)	(0.14)	(0.14)	(0.13)
Prop. Crimes/100k Ages 16-20	-0.13	-0.15	-0.17	-0.10	-0.09
	(0.19)	(0.18)	(0.22)	(0.23)	(0.21)
Prop. Crimes/100k Ages 21-25	0.15	0.03	-0.08	-0.08	-0.06
	(0.18)	(0.13)	(0.11)	(0.10)	(0.13)
Prop. Crimes/100k Ages 26-30	0.18	0.31	0.45	0.42	0.26
	(0.24)	(0.28)	(0.29)	(0.27)	(0.27)
Violent Crimes/100k Ages 11-15	2.13*	2.19**	2.06**	1.51*	1.66**
	(1.05)	(0.89)	(0.93)	(0.76)	(0.77)
Violent Crimes/100k Ages 16-20	-0.80	-0.90*	-1.08*	-1.17	-1.34
	(0.50)	(0.47)	(0.56)	(0.77)	(0.85)
Violent Crimes/100k Ages 21-25	-0.17	-0.69	-0.60	-0.21	-0.14
	(0.52)	(0.67)	(0.78)	(0.86)	(0.85)
Violent Crimes/100k Ages 26-30	1.94	2.39*	2.04	2.27*	1.33
	(1.15)	(1.19)	(1.31)	(1.22)	(1.03)
State Fixed-Effects	yes	yes	yes	yes	yes
Birth Cohort Fixed-Effects	yes	yes	yes	yes	yes
Unemployment Rates by Age	yes	yes	yes	yes	yes
States/Obs	17/170	17/170	17/170	17/170	17/170

Robust standard errors clustered by state shown in parentheses. ***indicates significance at 1% level, ** indicates significance at 5% level, * indicates significance at 10% level.