Locking up My Generation: Cohort Differences in Prison Spells and Correctional Supervision over the Life Course

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Short Abstract

The prison population in the United States is aging, but prior demographic research has not found support for the two most common explanations – longer prison sentences and general population aging. In this paper, we explore an alternative hypothesis – that there are large, non-linear cohort effects. The dataset consists of every prison spell in North Carolina from 1972 to 2016 annually (N~1.6 million). Using APC analysis, we found larger cohort-specific changes in the rate of serving prison sentence relative to period-specific changes. From roughly 1985 to 2010, cohorts who were age 24 at those times "picked up" a much higher likelihood of being in prison or under post-release supervision—throughout their observable lifetimes—than cohorts who entered young adulthood before and after those years. We show that a birth cohort's experience in the correctional system in their early 20's has a persisting effect throughout their life course.

Expanded Abstract

In Porter *et al.* (2016) we considered the aging of the U.S. state prison population during the last quarter of the 20th century into the debut of the 21st century. This population was getting older on average, which was not too surprising to most people given two well-known developments: the first, a demographic one, the aging of the general U.S. population; the second, a criminological one, the shift toward longer sentences in conjunction with higher rates of crime, especially in the 1990s.

Neither explanation maps as neatly into aging of the prison population as it may appear on the surface. If age-specific rates of incarceration are unchanging, then indeed the age distribution of the prison population would be a direct function of the age distribution of the general population. What makes a population age? The most important factor is declining fertility. Births in the U.S. did decline greatly from the peak of the Baby Boom (4.2-4.3 million annually between 1956 and 1961) to the trough of the Baby Bust (3.1-3.2 million between 1973 and 1976). These birth cohorts reached age 20 between, respectively, 1976-1981 and 1993-1996. If nothing else were changing, then this would have been sufficient to cause the mean age of people in prison to go up notably during this interval.[1]

But things did change: the so-called crack epidemic and its sequelae, including a penchant for stiffer sentencing, began placing more people in state prisons in the middle of the 1990s, precisely when demographic factors would have otherwise diminished the number of incarcerated young adults. As for

[1] Declining mortality, especially that occurring above the mean age of a population, will also contribute to a rise in that mean age. Improvements in mortality in the U.S. have for many years been concentrated at older ages. This, in conjunction with the fact that for over a quarter of a century now, the number of births in the U.S. has stabilized at 4.0±0.1 million annually means that aging in the U.S. is increasingly a function of mortality (not fertility) declines. This more recent aging pattern will be less and less relevant to the aging of prison populations, since persons at the ages enjoying the greatest benefit of declining mortality are incarcerated at very low rates.

the stricter sentencing, the first intuition is that it would have a distorting effect on the distribution of incarceration rates within a cohort, mitigating to some degree the tendency of incarceration—like all elements associated with crime and punishment—to decline rapidly after young adulthood. Thus a 20-year-old receiving a mandatory five-year term in 1995 would still be incarcerated in, say, 1998; whereas a 20-year-old in 1985 receiving a discretionary three-year term for the same offense would not likely still have been incarcerated *for that crime* in 1988.

The problem with this intuition is that while it is true virtually by definition at the level of the individual, it is not necessarily true at the population (cohort) level. The mean sentence length of, say, 20-year-olds, is calculated not across all 20-year-olds in the population, but across those 20-year-olds who are incarcerated. These are an admix of individuals such as the one referenced above whose time in prison will have indeed been extended under harsher enforcement and sentencing regimes than existed at earlier times; plus individuals with lesser offenses who might at an earlier time not have been in prison at all at age 20, but who are there, albeit for short stays, under a more punitive regime.[2] In which case changes in the severity of sanctions can affect the size of a cohort incarcerated without greatly altering its age-specific profile.

In the current paper, we explore an alternative hypothesis of prison aging – that there are large, non-linear cohort effects. We also examine to what extent and how higher rates of incarceration at younger ages in a cohort will lead to higher rates of incarceration (relative to other cohorts) at older ages. This dependence of incarceration at later ages on incarceration at earlier ages does not operate only through sentences that start at one age and continue through a later age. Individuals who are incarcerated when they are young are more likely to come to the attention of law enforcement and the judicial system later in life, independent of whatever characteristics are associated with criminal behavior and/or detection and enforcement (Pager 2003; Cooper et al. 2014).

The Porter et al. (2016) paper found prison aging as mostly a cohort effect, using sample data on state prisoners from across the United States, from six federal surveys done at five- to seven-year intervals between 1974 and 2004. We knew the characteristics of individual prisoners in the six survey years; and at the aggregate level we knew the *stock* of prisoners at up to six different ages within various birth cohorts. But because these were cross-sectional samples, we had no data on the in-flow and out-flow of prisoners over time within a cohort.

In the current paper, we reconsider the dynamics of incarceration within cohorts relative to a particular state, North Carolina. Using publicly available administrative records of convictions and sentences for all state inmates from 1972 to 2016, we have been able to construct an individual-level data set of time serving prison sentence (i.e. in prison or under post-release supervision) during the years of observation that reproduces quite well the state-level counts of population under such correctional supervision by year.[3] This allows us to understand the dynamics of incarceration within cohorts in a way about which, as per above, we could only speculate in Porter *et al*. (2016).

Partly to limit the growth in prison population, North Carolina had, in 1994, a well-documented shift in sentencing paradigm from indeterminate sentencing to determinate sentencing, known as the Structured Sentencing Act (SSA).[4] The Act had two explicit goals – eliminate parole release, and reduce, or at least control, the rapid growth of the North Carolina correctional system. North Carolina did in fact experience significant slowing in the growth of incarceration after the 1994 change in rules, and the SSA

[2] This argument is consistent with an observation by Pfaff (2011, 2012, 2013), that the mean length of prison sentences did not change greatly *among those in prison* even as enforcement was ramped up, sentences stiffened, and discretion reduced.

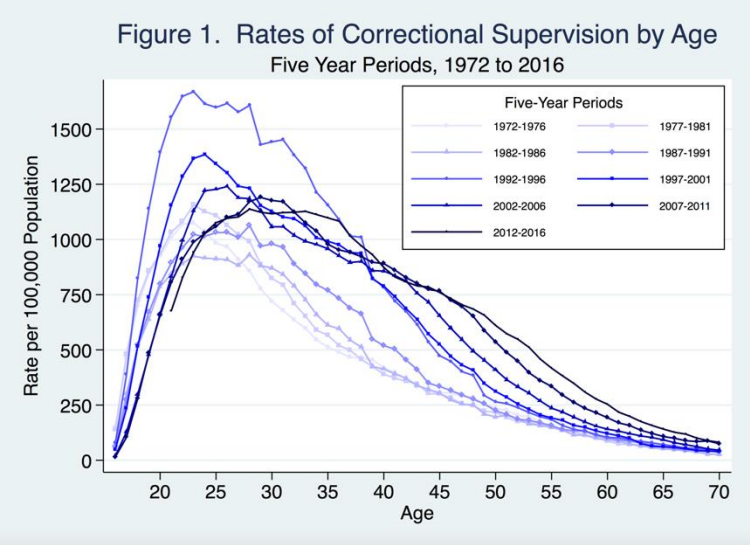
[3] In particular, North Carolina posts on a public website detailed information on all persons convicted of a crime. We scraped records from this site. The research plan has been subject to IRB approval.

[4] https://www.ncjrs.gov/pdffiles/168944.pdf

was recognized in 1997 by The Ford Foundation for Innovations in Government. Statistics from the Bureau of Justice statistics show that the US incarceration rate has increased 18% from 1994 to 2014, while North Carolina's has increased by 13%.[5] This paradigm shift allows us to show how these cohort-specific patterns of incarceration are perturbed by such events.

Age Distributions by Period and Cohort

We have a lot of data, so it is not easy to see everything on one graph. Let's look first at the age distributions of average rate of correctional supervision for 9 five-year periods from 1974 to 2016 in Figure 1 (1974-1978, 1979-1983, ….2012-2016). Not surprisingly, the 1992-1996 period is the high-water mark for incarceration, at least from ages 20 to 35. After that, things come down: 1997-2001 is still comparatively high in the early 20s, but—again, speaking about the early 20s in particular—the last two periods are quite similar to the first two periods.



In addition, we note the existence of a "hinge" that occurs at approximately age 38. For the four five-year periods preceding 1992 (1972-1976, 1977-1981, 1982-1986, and 1987-1991), rates of correctional supervision are in the neighborhood of 500 per 100,000 and decline together at succeeding ages. For the five five-year periods beginning with 1992 (1992-96, 1997-2001, 2002-2006, 2007-2011, and 2012-2016), incarceration rates in the late 30s are approximately double those occurring prior to 1992 (circa 1,000 per 100,000), and strikingly similar. The "hinge" metaphor comes from the fact that at successively later ages, the more recent the period, the higher the correctional supervision rate. It is higher from the late 40s on in 2012-2016 than it is in 2007-2011; and both are higher starting in the early 40s and onward than was the case in 2002-2006. The "policy change period" of 1992-1996, which has such high rates among young adults, falls off sharply in comparison post age-38.

How does this happen? It seems unlikely that judges, police, and correction officials started to ratchet up year after year the rates of supervision of older individuals, as if making up for a short-fall of younger inmates and parolees. (And, remember, these are *rates*, so we don't really know from these figures how many actual persons are involved at each age.) Rather, these higher rates at later-ages are precisely what one would expect from the legacy of earlier periods of high sanctioning, be it because (a) the same individuals are still being supervised for the same earlier offenses; (b) having been sanctioned earlier in life makes one more likely to be sanctioned later in life; (c) the type of folks who get sanctioned a lot early in life have characteristics that predispose them to be in sanctioning situations later in life; or (d) some combination of the three. All are, in a word (two words, really), *cohort effects*.

[5] https://www.vera.org/projects/incarceration-trends
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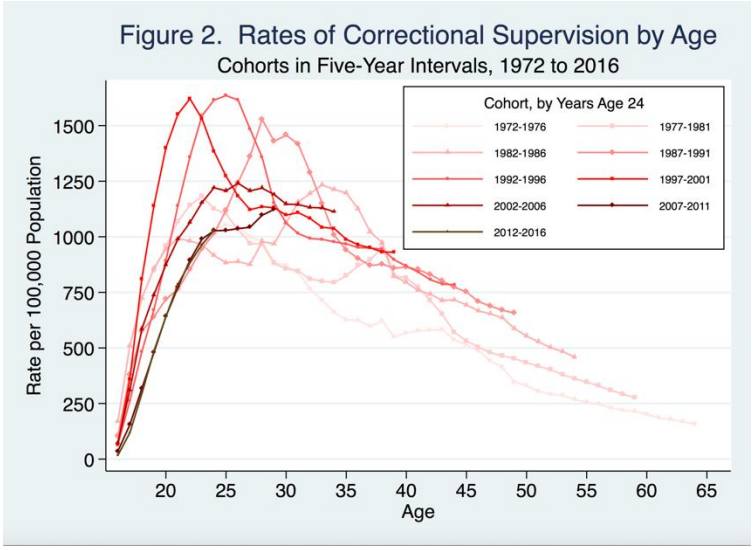
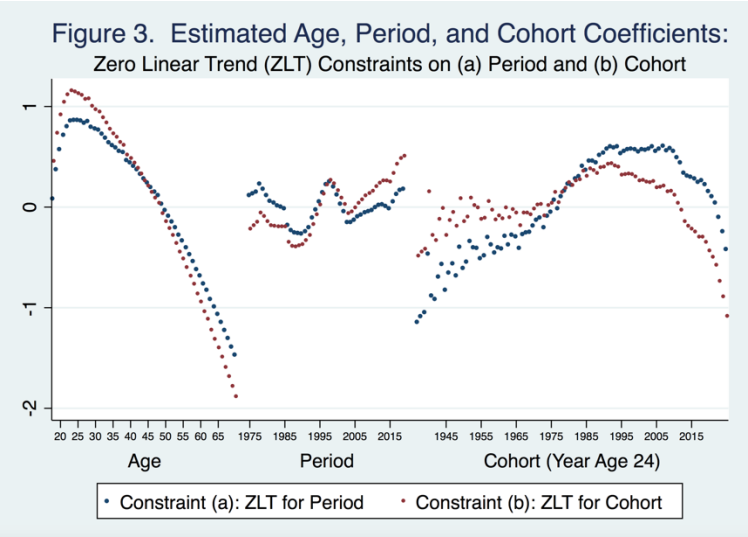


Figure 2 is the cohort-specific analogue to Figure 1. Cohorts are again aggregated across five-year intervals and are indexed so that the years conform to the year in which the cohorts obtained age 24. Thus, the line for the cohorts indexed as 1972-1976 reflects the *birth cohorts* of 1948 to 1952, the cohorts indexed as 1977-1981 are those born 1953-1957, and so on. The advantage is that the indexes match the *periods* in which these cohort were hitting young adulthood.

Once again, we can see how the "classic" age-crime curve within cohorts is perturbed by the 1990s policy shift—but maybe other things as well. For example, the cohorts that reached age 24 from 1972-1976 had peak age rates at ages 25 and 26. The cohorts that reached age 24 from 1977 to 1981 peaked at age 23. And the cohorts that reached age 24 between 1982 and 1986 had peak rates at age 21. At least until the 1990s: Then these latter cohorts had their highest incarceration rates, 1,250 per 100,000 at age 34, versus 1,000 per 100,000 at the earlier (age 21) peak. The high peaks (≥1,500 per 100,000) for cohorts obtaining age 24 in 1987-1991, 1992-1996, and 1997-2001 similarly drift earlier in age, from the late to the early 20s, reflecting the great increase in correctional supervision during the 1990s.

These curves are so influenced by period-specific events that it is difficult to pick out not only a "typical" age pattern, but also their relative scale, since their respective heights are in large measure a function of the amount of time they spent at younger adult ages during the 1990s. Yet, as it turns out, there is a fairly clear pattern of cohort change that is in many ways greater than that which is evident for period. To see this, we turn to an age-period-cohort model, estimated for rates at single years of age across single years over the period 1972 to 2016.



Assuming that policy shifts have no linear trend, we estimate an APC model with zero linear trend constraint on period effects. This untestable identifying assumption, and its implications for the trend in coefficients, is the backdrop for Figure 3, which plots age, period, and cohort effects on the same scale. These are the blue data points. The policy change period effect is there, centered around 1995. But what is striking is how comparatively small these period-specific changes are relative to

those captured in the cohort coefficients.[6]

For a quarter of a century, from roughly 1985 to 2010, cohorts who were age 24 at those times "picked up" a much higher likelihood of correctional supervision—throughout their observable lifetimes—than those cohorts who entered young adulthood prior to those years or since. As per the argument adduced in the Porter et al. (2016) paper, the heritage of incarceration and adjudication that constitutes a cohort effect is very much the transmission of climates for crime and punishment that weigh in the first instance on younger adults, who are most prone to crime. But the sentencing shocks that are evident in the middle of Figure 3 make for a great deal of variability in the functional life course of the cohorts whose general level of exposure to prison and correctional supervision are governed by the long-term secular pattern on the right-hand side of the figure (*i.e*., cohort effects, as interpreted above). The challenge now is to use the micro data on careers to flesh out how this process plays out over the life course. We have already been using the micro data to consider cohort differences in sub-populations—it turns out that the sentencing shocks have been felt most acutely among the African-American population. More to come!

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[6] Also depicted in Figure 3 are the respective age, period, and cohort effects (in red), under an alternative identifying restriction: That there is no linear trend *in cohort*. We think that the no-linear-trend-in-period assumption is easier to justify, but what is important here is that a comparison between the linear restraints on period and those on cohort do not much change things: There is simply not much *trend* in historical time, even if there is substantial non-linear variation. Age patterns, in contrast, trend downwards at a high rate after the early 20s, regardless of the identifying assumption on the historical time trends (period, cohort). This is in conformity with longstanding theory and empirical observation (Hirschi & Gottfredson 1983).