LIVING STANDARDS IN BLACK AND WHITE: EVIDENCE FROM THE HEIGHTS OF OHIO PRISON INMATES, 1829 - 1913

SCOTT ALAN CARSON
THOMAS N. MALONEY

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Abstract

The use of height data to measure living standards is now a well-established method in the economic history literature. Moreover, a number of core findings in this literature are widely agreed upon. There are still some populations, places, and times, however, for which anthropometric evidence remains thin. One example is African-Americans in the Northern US in the 1800s. Here, we use new data from the state prison in Ohio to track heights of black and white men from 1829 to 1913. We corroborate the well-known mid-century height decline among white men in Ohio, found by Steckel and Haurin (1994) using National Guard data. We find that black men in Ohio were shorter than white men, throughout the century and controlling for a number of characteristics. We also find a pattern of height decline in mid-century similar to that found for white men.

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Scott Alan Carson
School of Business
University of Texas, Permian Basin
4901 East University
Odessa, TX 79762
USA
Carson_S@utpb.edu

Thomas N. Maloney
Department of Economics
University of Utah
1645 Campus Center Dr., Rm 308
Salt Lake City, UT 84112
USA
maloney@economics.utah.edu

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Industrialization and modernization bring about rising incomes, wages and life expectancy in the long run (Komlos 1987; Floud, Wachter and Gregory 1990, pp. 272-273). However, in the short run they also create economic and social turmoil, such as increasing inequality and more virulent disease environments, which can lead to deteriorating biological living conditions. Hence, the overall effect of the early stages of industrialization and modernization on biological living standards depends on which of these effects dominates. A growing body of evidence indicates that the net effect was negative for free Northern whites in the US in the early stages of industrialization. In the second quarter of the 19th century, the average stature of males began a sustained diminution that may not have ended until the 4th quarter of the 19th century (Komlos, 1987, 1996).

While the rough outlines of this pattern are established, a full understanding of the details requires additional evidence. In particular, little is known about the biological living standards of Africa-Americans in the North at this time. In this paper, we use a new data set collected from the records of the Ohio state prison in Columbus to compare

the development of the biological living standards of black men and white men in Ohio through the 19th century. This is a very appropriate time and place in which to study the biological living standards of males in a rapidly developing economy. During the early 19th century, states such as Ohio, Illinois and Indiana were America's far western frontier. By the mid-19th century, these states were beginning to develop an industrial sector. By the end of the 19th century, the Great Lakes region contained substantial manufacturing centers but also areas that remained, to a large degree, rural.

In addition, our data are unusually well suited for constructing racial comparisons in the North. While existing studies of African-American biological living standards tend to rely on race-specific documents, including slave records and identification cards issued to free blacks in the South, we have large samples of both black and white individuals from a uniform set of records from the Ohio state prison. Our data set also covers an unusually long time period, allowing us to examine developments both before and after the Civil War. Using these data, we examine the following questions: First, how did biological living conditions vary across demographic, geographic, and socioeconomic categories for men in Ohio? Second, how large were stature differences between blacks and whites and what were their sources? Finally, did blacks in Ohio experience the same kind of stature cycle that whites experienced?

The Biological Living Standards of African-Americans in the 1800s

There is a substantial literature on the biological living standards of blacks under slavery. Black slaves reached adult heights well below those of whites, and slave children experienced profound height and health deficits (Steckel 1986). The fact that

slaves did not achieve mean heights equal to those of free whites is not very shocking. However, tracking the time path of black heights in the South does reveal some surprises. Komlos and Coclanis (1997) document increasing average stature for black convicts in Georgia in the antebellum period, and Steckel (1995) finds a similar increase among transported slaves. This is in marked contrast to height reductions among whites in this period. One likely explanation for this difference is the change in the composition of the slave population in terms of nativity. As the proportion African-born declined among slaves, average heights increased due to better acclimation to the North American disease climate.

Evidence on free blacks in the 19th century is also largely from the South and largely from the antebellum period. Bodenhorn (1999) studies registration records for free blacks in Virginia and finds a pattern that contrasts somewhat with the pattern observed among slaves. While free blacks were generally taller than slaves, their height declined between 1800 and 1830 (dating by birth cohorts), in contrast to increases in slave heights during this era. Using similar records for Maryland, Komlos (1992) documents a decline in the average heights of free blacks in that state between the 1820s and the 1840s. So free Southern blacks may have experienced a decline in average height in the antebellum period similar to that found for whites.

Blacks in Ohio in the 1800s

In this paper, we provide evidence on biological living standards for blacks and whites in one Northern state, Ohio. Ohio occupies a complex place in 19th century African-American history. It was central to the operation of the underground railroad,

the point at which tens of thousands of slaves emerged into freedom (Johnson and Campbell p. 36). At the same time, Ohio's antebellum legal restrictions on blacks, while "by no means unique," were "certainly among the most severe" in the North (Gerber p. 9). Beginning in 1804, blacks in Ohio were required to obtain a "certificate of freedom" in order to live and work in the state, and beginning in 1807 they were required to post a $500 bond with their county clerk within 20 days of arriving in the state, though the law was only sporadically enforced (Cayton, pp. 9, 110; Johnson and Campbell, p. 39). Black children were forbidden from attending public school in Ohio until the 1840s, and legally segregated schools predominated from the 1840s to the 1880s (Cayton, pp. 61, 200). Notably, though blacks of course gained access to the vote under the 15th amendment in 1870, the explicit (but ineffectual) restriction of suffrage to whites remained in the Ohio state constitution until 1923 (Ibid., p. 231).

There was some variation within Ohio in the status of the black community. The southern part of the state generally placed the greatest limits, both explicit and implicit, on African-American life. This may have reflected anxieties about the potential influx of large numbers of blacks from Kentucky and Virginia, as well as close cultural and economic ties between Ohioans in this part of the state and residents of the South (Gerber, pp. 9-11). In the Northern part of the state, the (substantially smaller) black community enjoyed somewhat greater openness on the part of the white population. For instance, Cleveland began to subsidize local black schools in 1843 and abolished segregation in local schools in the 1850s (while the state did not pass a school desegregation law until 1887) (Cayton pp. 62-3, 200).

The end of the Civil War brought considerable change in the size and circumstances of Ohio's black community. The black population of Ohio rose from 36,673 in 1860 to 63,213 in 1870. Though blacks were still less than three percent of the population of the state, this increase was the fastest among all Northern states during this decade, leaving Ohio second to Pennsylvania in total black population and second to New Jersey in percent black among Northern states. The arrival of black refugees during the war initially provoked an "hysterical" response, including the passage of a miscegenation law in 1861. However, the fact that many of the wartime and post-war black migrants to Ohio moved as families and settled in rural areas may have dampened the reaction of whites somewhat (Gerber, pp. 28-33).

The pace of increase in Ohio's black population slowed substantially over time: the 72 percent growth of the 1860s was followed by a 26 percent increase in the 1870s and a nine percent increase in the 1880s. In 1870, half of all Ohio blacks were Southern born, but this share fell to 36 percent in 1900 as migration slowed (Ibid., pp. 28-41). Much of the growth of the black population was concentrated in the Southern and Western parts of the state. Where the black community was growing most rapidly, efforts to constrain the economic and political aspirations of that community were apparently most severe. This process is perhaps most visible in the contrast between racial political and economic patterns in Cleveland and in Cincinnati (Bertaux, pp. 141-2).

Biological Living Standards in Ohio

Most research on heights in the 19th century US places individuals in the Midwest in the middle of the height spectrum. People in the non-coastal South and in the West were taller, and people in the coastal South, the East, and the Northeast were on average shorter (Steckel 1992a, p. 289). Steckel and Haurin (1994, pp. 121-122) examine Ohio-specific evidence on heights using measurements of 19th century Ohio National Guardsman. They find a modest decline of about 1 inch in average male stature between 1878 and 1896, with a post-1896 recovery. This may suggest that the stature decline observed in the antebellum period in more industrialized regions in the Eastern US began later in Ohio (Komlos, 1987). Steckel and Haurin also uncover a ranking of heights across occupations: professionals were the tallest, followed by farmers, clerical workers, and skilled and unskilled laborers. Native-born recruits were taller than foreign-born recruits by nearly 1 inch. Rural residents within Ohio were nearly 1 quarter inch taller than urban residents.

We are unaware of any published analysis of the stature of black Ohioans in the 19th century. Still, the historical context provided above and the broader literature on biological living standards in this period suggest several points to keep in mind as we examine our data. First, region of birth may matter, both because heights in general varied across region and because the heights of slaves followed a different pattern over time than did the heights of free blacks. Second, region of residence within Ohio may matter, if blacks in the Southern part of the state faced greater obstacles to economic advancement. Finally, while we should expect urban and rural residents to have achieved

different heights, we should keep in mind that cities in the Midwest were not as residentially segregated in the 19th century as they would become during and after the Great Migration of blacks out of the South. As a result, black city residents and white city residents probably faced similar disease climates, with similar implications for their health and height (Taylor, 1993; Cuff, 2005, p. 19).

The Ohio Prison Data

The first Ohio penitentiary was established in 1815, and housed a prison population of 150 inmates in the first five years of operation. Shortly thereafter, a second prison was constructed near the first with an estimated 1,113,462 hours of convict labor. The site of the present Ohio State penitentiary, from which our records are extracted, was completed in 1834. The main inmate housing site had a capacity of 700 inmates and was modeled after the prison facility in Auburn, New York. In the Auburn, or "silent", correctional system, it was anticipated that inmates would be rehabilitated by being compelled to work, with the profits used to support the Ohio state prison.

Close proximity to other inmates and unsanitary conditions facilitated the spread of disease. Like the rest of America, inmates in the Ohio prison were stricken with cholera in 1849, and 121 out of 423 inmates succumbed to the disease (Rosenberg, pp. 101-120). Note, though, that our evidence on heights is not affected by these conditions because measurements were taken as inmates were received and therefore reflect their pre-incarceration living standards.

It is against this historical backdrop that we examine nearly 36,000 male inmate records from the Ohio prison system between 1829 and 1913.[1] Prison guards routinely recorded the dates inmates were received, age at incarceration, complexion, state of birth, stature, pre-incarceration occupation, the county in which the inmate was received and the inmate's crime. "Race" was not recorded explicitly in the prison records but can be inferred from the detailed descriptions of "complexion" that are provided.[2] Detailed descriptions of occupation are provided as well, but we focus here on the main distinction in the literature on biological living standards – that between farmers and non-farmers.

The Heights of Ohio's Black and White Prisoners

Prison records are particularly useful for examining changes in biological living standards. They are widely available. They also provide among the most accurate stature measurements.[3] While they are not random samples, the selectivity they represent is to some degree an advantage for the study of changes in stature. The individuals in these records were likely to be of low socioeconomic status and so were most vulnerable to

[1]Nearly all records between 1829 and 1913 are used here, except those for 1868, which were not available.

[2] Following Komlos and Coclanis (1996), we code as "black" all inmates with complexions recorded as black, brown, copper, dark brown, dark mulatto, ginger, light brown, light mulatto, mulatto and yellow. Inmates with complexions recorded as fair, florid, dark, light, ruddy, sallow, sandy and swarthy are considered as from European ancestry and are coded "white."

[3] Many 19th century and earlier stature measurements were rounded to the nearest inch or half inch. However, there was great care in recording inmate statures because accurate measurement may have had legal implications in the event that an inmate escaped and later was recaptured. Most inmates' statures were recorded at quarter, eighth, and even sixteenth increments.

economic change. For the study of height as an indicator of change in biological living standards, this kind of selection is preferable to the kind of selection that marks many military records – minimum height requirements for service.

Table 1 presents average heights for white and black adult men (older than 22) in the prison sample, calculated separately for farmers and non-farmers, by region of birth, and by proximity to water (that is, residence prior to incarceration in a county containing or bordered by a river or large lake), for all birth cohorts combined. For both groups, the expected height patterns hold: farmers were taller than non-farmers, and individuals who lived near water were somewhat shorter than individuals who did not. Regional averages followed similar but not identical patterns for blacks and whites. For both groups, individuals born in the Middle Atlantic were shortest, those born in the West were relatively tall, and the Ohio-born fell near the middle of the ranking. Notably, though, Southeastern-born whites were taller than whites born anywhere else, while Southeastern-born blacks were relatively short. Though we can not directly identify former slaves in the data set, it seems likely that this height disadvantage for Southeastern-born blacks reflects the fact that many of these individuals grew up under the harsh biological conditions of slavery. Given the discussion in the narrative history of variation in black status within Ohio, especially the particularly severe limitations on black status in the southern part of the state, we calculate average heights separately for the two-county band along the state's southern border. Whites in these counties were slightly taller than whites in the rest of the state, while blacks were somewhat shorter.

Within all cells, white heights exceeded black heights, with the gap for the Southeastern-born being quite large.

Table 1: Mean Adult Height by Category (in Centimeters)

	White		Black		Height
	Height	N	Height	N	Difference
Farmer	173.85	2872	172.09	370	1.76
Non-Farmer	171.92	14465	170.50	3143	1.42
Region of Birth					
New England	172.11	610	171.18	32	0.93
Middle Atlantic	171.58	4098	169.67	327	1.91
Great Lakes (exc. Ohio)	171.75	1128	170.17	106	1.58
Ohio	172.33	8913	170.89	983	1.44
Southeast	173.46	2043	170.67	1860	2.79
Plains	171.76	296	170.41	86	1.35
West	173.08	249	171.89	120	1.19
Water					
Lake	171.21	2476	169.89	455	1.32
No Lake	172.41	14861	170.78	3058	1.63
River	172.15	3851	170.37	1071	1.78
No River	172.28	12030	170.93	1849	1.35
Southern County	172.42	4253	170.53	1188	1.89
Non-Southern County	172.18	12814	170.73	2332	1.45

Source: Source: Date used to study Ohio biological conditions is a subset of a much larger 19th century prison sample. All available records from American state repositories have been acquired and entered into a master file. These records include Arizona, California, Colorado, Idaho, Illinois, Kansas, Kentucky, Missouri, New Mexico, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah and Washington. Prison records used in this manuscript are from the Ohio prison.

Notes: Southern counties are those along the Ohio river, plus those immediately North of these border counties: Hamilton, Clermont, Brown, Adams, Scioto, Lawrence, Gallia, Meigs, Washington, Monroe, Belmont, Jefferson, and Columbiana, Butler, Carroll, Clinton, Guernsey, Harrison, Highland, Jackson, Morgan, Noble, Pike, Stark, Vinton, and Warren. Regions are defined as follows: New England = CT, ME, NH, RI, VT and "New England;" Middle Atlantic = DE, DC, MD, NJ, NY, and PA; Great Lakes = IL, IN, MI, and WI; Plains = IA, KS, MN, MO, NE ND, and SD; Southeast = AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, and WV; West = AZ, NM, OK, TX, AK, CA, ID, UT, CO, MT, NV, OR, WA, WY, and "Indian Territory."

Figure 1: Mean Adult Height by Race and Year of Birth

When we examine change in height over time, we find the pattern of decline in the mid-1800s which has been frequently demonstrated for whites. Our evidence shows that the heights of Northern-resident blacks also followed this time path (see Figure 1). We present height by year of birth and race, for adults, in Figure 1. While the decline occurs for both blacks and whites, it is steeper for blacks through 1840, with some absolute and relative recovery for this group after that point. Comparing our white inmates to Steckel and Haurin's Ohio National Guard sample indicates that our prisoners were shorter, and that height decline set in a bit earlier for our group. For Guardsmen born between 1840 and 1880, Steckel and Haurin find average heights of between 68.4 and 68.9 inches, or 173.74 to 175.01 centimeters, depending on location of residence, and

their sample exhibits little net change in average height over this period (the decline in their sample comes later – see Steckel and Haurin, 1994, pp. 123-124). As noted above, we should not be surprised to find these kinds of differences between the National Guard sample and our prison sample. We expect individuals in prison samples to be short (due to both poorer average conditions and the absence of the minimum height requirements that characterize military samples). We also expect heights calculated from prison samples to exhibit greater sensitivity to fluctuations in living standards, so that deteriorating biological conditions might show up earlier in our prison sample than in the National Guard sample.

Regional differences in height, changes in migration patterns, and selectivity in migration might affect the picture painted in Figure 1. For example, the share of the white sample born in the Southeast fell from almost 20 percent in 1800 to about 8 percent in 1880. This change would probably lead to declining average heights among whites in our sample, all else equal. As an initial control for these kinds of compositional effects, we calculate the time path of height separately for the Ohio-born – see Figure 2. The general decline across birth cohorts is still apparent, as is the white height advantage in each decade.[4] (In the regression analysis below, we will control for region of birth directly.)

[4] In all graphs, dates refer to the decade beginning in that year, and points are plotted only for cells containing at least 20 observations.

Figure 2: Mean Adult Height by Race and Year of Birth, Ohio Born Inmates

Comparing the heights of black youth and white youth is somewhat more complicated. Because there is substantial change in height with age during youth (ages 14 to 22 here), height averages constructed without age controls are not too informative. We therefore construct age-standardized height measures for youth as follows: we pool the sample across all birth years and calculate overall age-specific height means for whites. We then normalize the height of each individual by the white mean for the given age. Both the raw means (in centimeters) by age and race and the standardized means by characteristic are presented in Table 2. As for adults, individuals from the West tended to be tall, the Ohio-born held a position near the middle of the height rankings, and the black-white gap among the Southeastern-born was especially large. The patterns related

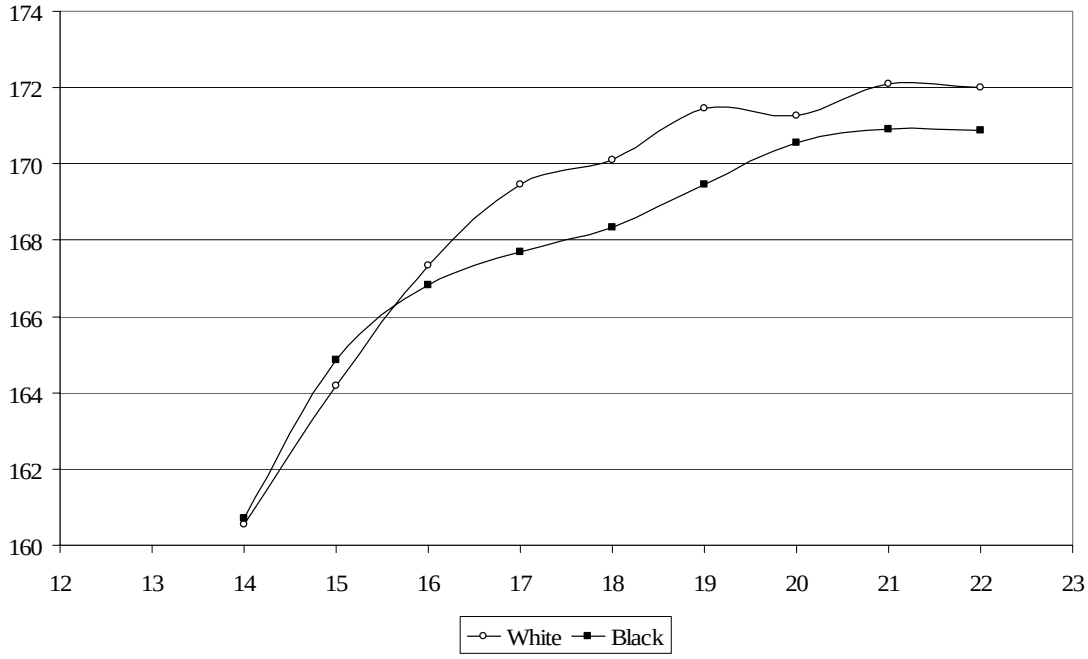
to farming and proximity to water appear as expected. For youth, the racial gap within southern counties in Ohio did not exceed the gap within non-southern counties.

Table 2: Mean Youth Height by Category

	White		Black		Height
	Height	N	Height	N	Difference
A. By Age (centimeters)					
14	160.56	23	160.71	17	-0.15
15	164.20	80	164.87	25	-0.67
16	167.35	266	166.83	70	0.52
17	169.47	646	167.68	144	1.79
18	170.10	885	168.33	204	1.77
19	171.45	1120	169.46	235	1.99
20	171.26	1125	170.56	232	0.70
21	172.10	1432	170.91	297	1.19
22	172.00	1575	170.87	327	1.13
B. By Characteristics (Age Standardized)					
Farmer	100.92	1242	100.09	161	0.83
Non-Farmer	99.81	5910	99.14	1390	0.67
Region of Birth					
New England	99.72	183	98.06	14	1.66
Middle Atlantic	99.51	1410	99.05	111	0.46
Great Lakes (exc. Ohio)	99.87	487	98.98	66	0.89
Ohio	100.07	4196	99.31	651	0.76
Southeast	100.79	630	99.13	615	1.66
Plains	99.91	151	99.05	31	0.86
West	100.36	95	100.58	63	-0.22
Proximity to Water					
Lake	99.66	1051	98.86	133	0.8
No Lake	100.06	6101	99.28	1418	0.78
River	99.88	2159	99.16	696	0.72
No River	100.05	4993	99.31	855	0.74
Southern County	100.04	1868	99.30	542	0.74
Non-Southern County	99.99	5284	99.21	1009	0.78

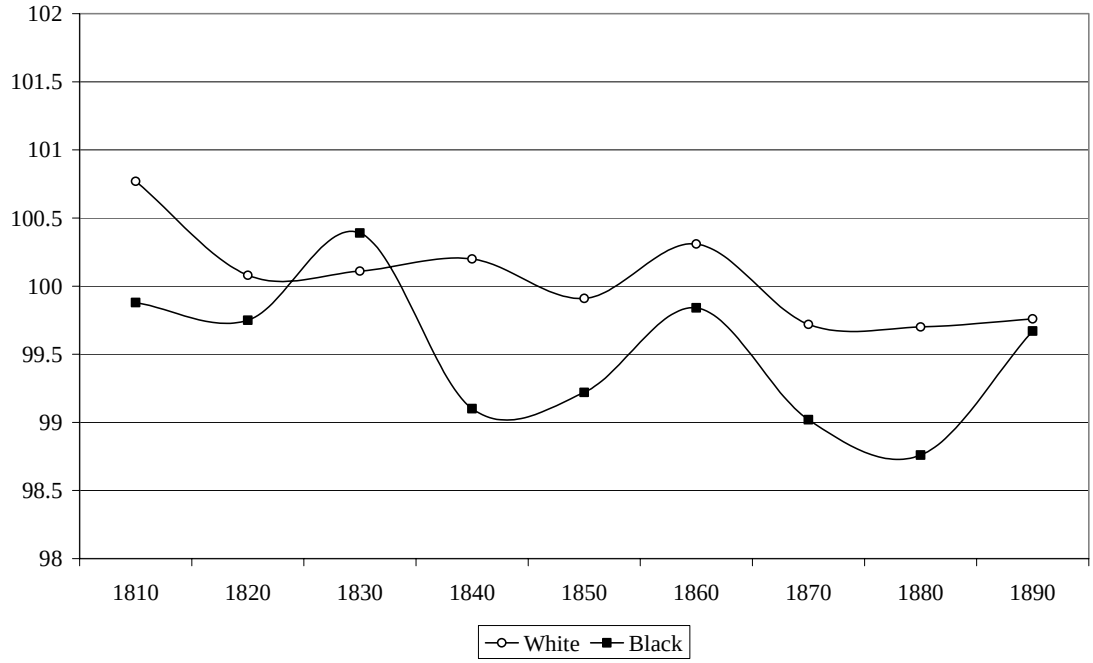
Each individual's height is standardized by the average height for whites of the same age.
See Table 1 for definition of regions and of southern counties.
Source: Ohio prison data set

Figure 3: Mean Height of Youths by Age



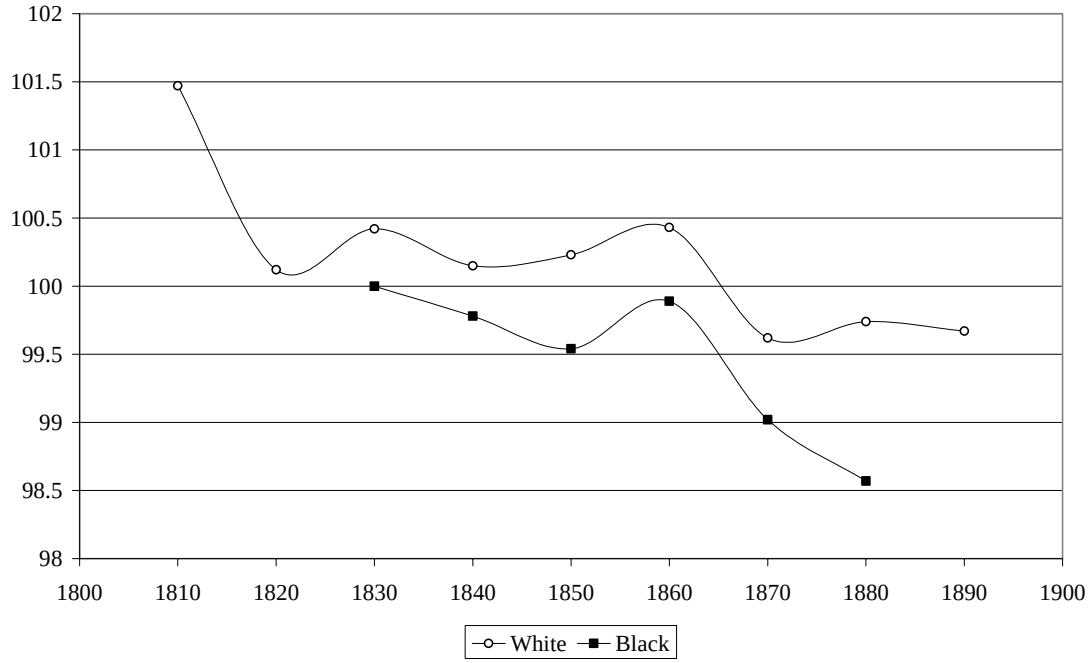
The pattern in height by age is itself worth noting. At ages 14 and 15, average black height exceeded average white height, but adolescent growth was much more rapid for young white men after that point. The growth process lasted somewhat longer for black youth, though, producing some net catch-up after age 19 (see Figure 3). This finding of shorter adult height but a longer growth process for more impoverished populations fits the patterns documented elsewhere (Cuff 2005, p. 16).

Figure 4: Mean Standardized Youth Height by Race and Year of Birth



Change over time in the standardized height of youths appears somewhat muted (see Figure 4). Controlling for region of birth by restricting the sample to the Ohio-born produces a more dramatic sense of decline over time for both blacks and whites (Figure 5). White youth heights exceed black youth heights in all cases, except for the 1830s cohort in the all-region sample.

Figure 5: Mean Standardized Youth Height By Race and Year of Birth, Ohio-Born Inmates



To more rigorously identify these demographic and chronological height differentials, we estimate simple regression models for height as a function of race, birth cohort, region of birth, proximity to water, farm residence, and southern county residence. Means for the regression data sets, for blacks and whites and adults and youth separately, are presented in Table 3. The overall average height difference between blacks and whites is about 1.6 centimeters for adults and 1.2 centimeters for youth. In both groups, the black sample is disproportionately concentrated in the shorter (post-Civil War) birth cohorts, and blacks are less likely to be farm residents but more likely to live close to water. All of these factors could contribute to the overall black-white height gap. However, the coefficients on "black" in the race-pooled regression results in Tables 4 and

5 indicate that essentially all of the average race gap remains after we control for these characteristics.

Table 3: Means of Regression Data Sets

	Adult		Youth	
	White	Black	White	Black
Height (centimeters)	172.241	170.667	170.809	169.597
Birth Cohort:				
1780	.002	.001		
1790	.009	.004		
1800	.024	.009		
1810	.045	.022	.026	.016
1820	.050	.034	.038	.016
1830	.071	.046	.061	.029
1840	.126	.092	.098	.080
1850	.206	.170	.164	.123
1860	.240	.238	.235	.190
1870	.175	.257	.298	.379
1880	.053	.128	.073	.150
1890			.007	.018
Region of Birth				
New England	.035	.009	.026	.009
Mid-Atlantic	.236	.094	.197	.072
Plains	.017	.024	.021	.020
South East	.118	.530	.088	.397
Great Lakes	.065	.030	.068	.043
Ohio	.514	.279	.587	.420
West	.014	.034	.013	.041
Lake	.143	.129	.147	.086
River	.306	.473	.302	.449
Farm	.166	.106	.173	.104
Southern County	.261	.338	.261	.350
Age				
14			.003	.011
15			.011	.016
16			.037	.045
17			.090	.093
18			.124	.132
19			.157	.152
20			.157	.150
21			.200	.192
22			.220	.211
N	17337	3520	7152	1551

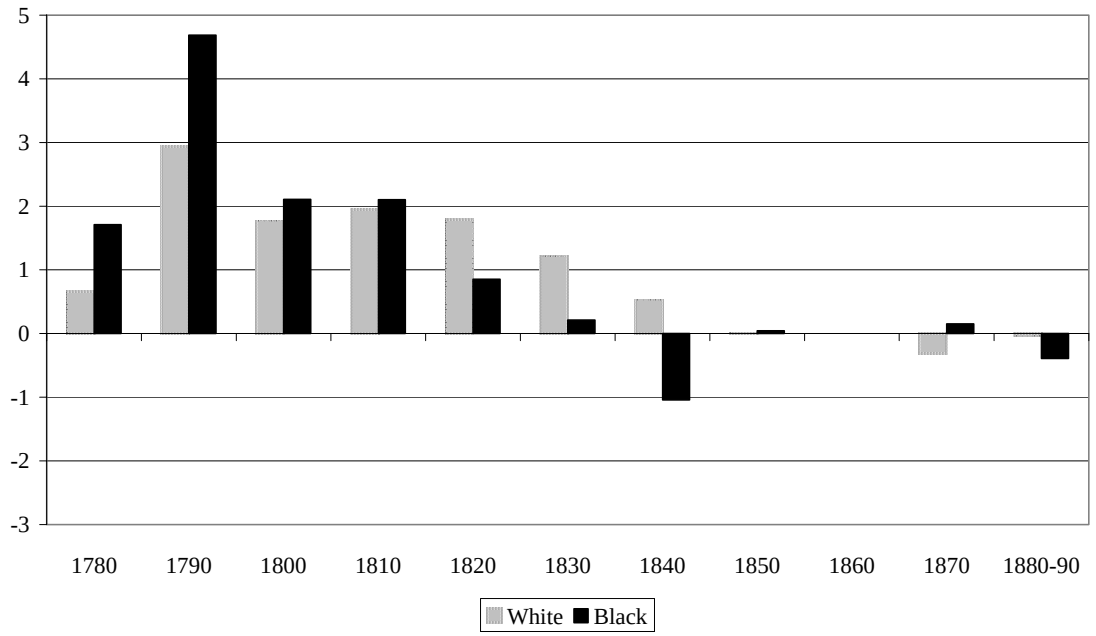
For adults, “1880” birth cohort includes those born in the 1880s and 1890s.

The general decline in height over the course of the 1800s is apparent in all of the adult regressions presented in Table 4 – for the overall sample, and for whites and blacks separately. (The set of birth cohort controls is statistically significant as a group at the .01 level in each regression.) The advantage of farm residence and the disadvantage of proximity to water are also apparent in all of these results. Examining separate regressions for blacks and whites, however, does allow us to identify some differences in the patterns, particularly the advantage held by whites born in the Southeast. These race separate regressions also allow us to more closely examine change in height over time for blacks and whites , controlling for other factors. Figure 6 plots the birth cohort coefficients from these regressions. Here, the decline in height through the first half of the century appears more pronounced for blacks, with a particularly large disadvantage for blacks born in the 1840s.

Table 4: Height Regressions: Adults

	All		White		Black	
	(Coeff)	(P-value)	(Coeff)	(P-value)	(Coeff)	(P-value)
Intercept	172.074	.01	171.973	.01	171.164	.01
Black	-1.615	.01				
Birth Cohort:						
1780	0.812	.47	0.664	.58	1.709	.57
1790	3.062	.01	2.934	.01	4.686	.01
1800	1.785	.01	1.769	.01	2.109	.08
1810	1.943	.01	1.944	.01	2.102	.01
1820	1.670	.01	1.791	.01	0.851	.20
1830	1.095	.01	1.219	.01	0.214	.71
1840	0.318	.04	0.525	.01	-1.044	.02
1850	0.006	.96	0.013	.93	0.043	.90
1860	Base		Base		Base	
1870	-0.193	.16	-0.311	.04	0.150	.64
1880-90	-.0.149	.45	-0.040	.86	-0.393	.32
Region of Birth						
New England	-0.677	.01	-0.702	.01	0.452	.71
Mid-Atlantic	-1.095	.01	-1.081	.01	-1.307	.01
Plains	-0.282	.40	-0.305	.41	-0.407	.59
South East	0.314	.02	0.622	.01	-0.306	.25
Great Lakes	-0.276	.15	-0.227	.26	-0.521	.45
Ohio	Base		Base		Base	
West	0.853	.01	0.935	.02	0.266	.69
Lake	-0.655	.01	-0.599	.01	-0.907	.02
River	-0.350	.01	-0.316	.01	-0.585	.04
Farm	1.374	.01	1.374	.01	1.224	.01
Southern County	0.297	.01	0.350	.01	0.111	.69
N	20857		17337		3520	
Adj. R^2	.03		.03		.01	

Figure 6: Coefficients on Birth Cohort, Adults (1860 Base)

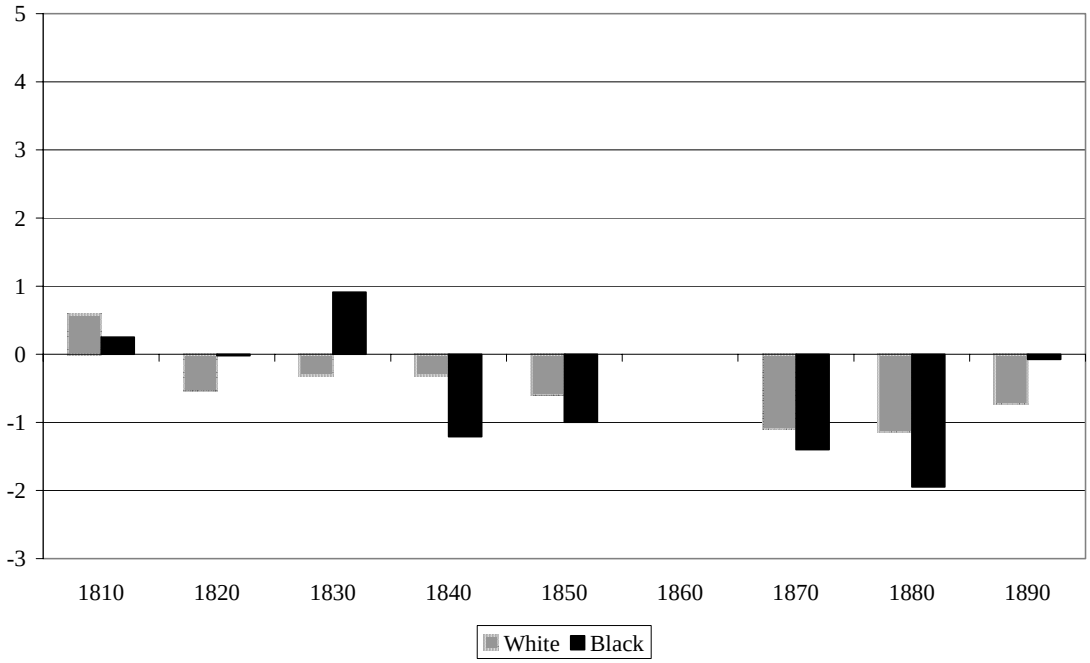


In the youth regressions, we again find advantages from farm residence, disadvantages from proximity to water (except in the black-only regression), a large advantage from Southeastern birth for whites, and no such advantage for Southeastern-born blacks (relative to other blacks). The timing of height decline appears to have been somewhat different for these adolescents than for adults, with more of the decline occurring among post-Civil War birth cohorts (see Figure 7). (The set of birth cohort controls is statistically significant at the .05 level in all of these regressions.) Again, as among adults, the changes over time were somewhat more pronounced for blacks than for whites, at least in these point estimates.

Table 5: Height Regressions: Youth

	All		White		Black	
	(Coeff)	(P-value)	(Coeff)	(P-value)	(Coeff)	(P-value)
Intercept	172.649	.01	172.569	.01	171.799	.01
Black	-1.337	.01				
Birth Cohort						
1810	0.584	.22	0.582	.24	0.250	.86
1820	-0.490	.23	-0.536	.20	-0.021	.99
1830	-0.220	.50	-0.312	.36	0.911	.40
1840	-0.413	.119	-0.314	.27	-1.207	.10
1850	-0.679	.01	-0.596	.01	-0.998	.12
1860	Base		Base		Base	
1870	-1.124	.01	-1.099	.01	-1.399	.01
1880	-1.306	.01	-1.139	.01	-1.946	.01
1890	-0.500	.49	-0.733	.41	-0.075	.96
Region of Birth						
New England	-0.722	.12	-0.580	.22	-2.255	.21
Mid-Atlantic	-0.958	.01	-0.977	.01	-0.338	.63
Plains	-0.121	.80	-0.135	.79	-0.146	.91
South East	0.468	.03	1.053	.01	-0.374	.33
Great Lakes	-0.253	.38	-0.225	.46	-0.581	.50
Ohio	Base		Base		Base	
West	0.961	.07	0.404	.54	2.027	.04
Lake	-0.329	.13	-0.302	.18	-0.457	.49
River	-0.454	.01	-0.522	.01	-0.105	.80
Farm	1.545	.01	1.566	.01	1.085	.08
Southern County	0.326	.08	0.302	.15	0.437	.29
Age						
14	-10.861	.01	-11.408	.01	-10.161	.01
15	-7.481	.01	-7.901	.01	-6.307	.01
16	-4.513	.01	-4.679	.01	-3.832	.01
17	-2.584	.01	-2.469	.01	-3.013	.01
18	-2.043	.01	-1.934	.01	-2.447	.01
19	-0.684	.01	-0.554	.02	-1.339	.02
20	-0.631	.01	-0.695	.01	-0.313	.59
21	0.055	.793	0.039	.86	0.035	.95
22	Base		Base		Base	
N	8703		7152		1551	
Adj. R^2	.08		.07		.07	

Figure 7: Coefficients on Birth Cohort, Youth (1860 Base)



Conclusion

Our data on nearly a century of inmate records from the Ohio state prison provide a rare opportunity to examine the heights of free, Northern-resident blacks in the 1800s and to compare their heights to those of whites measured at the same time for the same purposes. Our results indicate that the average heights of African American residents of Ohio declined just as the average heights of white residents of Ohio did. The negative biological consequences of the initial expansion of industrialization and trade affected these two groups in similar ways, despite the substantial differences in their places of origin and other conditions of their lives. We also find that the height advantage of Southern birth was quite apparent for whites but did not extend to blacks. Any general benefits from the warmer climate and more rural conditions of a Southern childhood were, not surprisingly, overwhelmed by the profound biological challenges of slave life.

Finally, while modern Africans and Europeans achieve comparable average height when brought to maturity under optimal biological conditions, we find that, controlling for many relevant factors, substantial and statistically significant height differences persisted between whites and blacks in Ohio in the 1800s.

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