

Newgate girls on the voyage to New South Wales, 1825-40

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The recorded heights of the female convicts transported to New South Wales have had much to tell us about the circumstances in which the daughters of the English poor grew to maturity.¹ Mainly, this has been a matter of inferences drawn from the pattern of adult heights. The convicts were measured on their arrival in the penal colony having spent an average of nine months in confinement, first in prison and then on board a convict ship. For adults, who were the same height when they landed as they had been on arrest, the fact of their having been measured in the colony is of course no bar to the treatment of their average height as the product of the conditions into which they had been born. The height on arrival of a girl who was still young enough to have been growing, however, was the outcome both of her life as a child in England and of the conditions in which she had been held after her arrest, and this greatly complicates the interpretation of the heights data for the younger convicts.

The age pattern of height on arrival of the younger convicts is nonetheless suggestive, particularly for the London-born. The fact is that London's transported convict girls were surprisingly tall for their age, considering the severely stunted population from which they came. The smaller the number of convicts on the ship on which they had been carried to Australia, moreover, the taller they tended to be on arrival.² This is consistent with a girl's rate of bodily growth having been influenced by the general state of health on the ship on which she travelled, which can be expected to have depended in turn upon the number of convicts on board. Large numbers certainly made it more difficult for the surgeon to reduce the sickness rate during the voyage,³ and the height-age profile on the larger ships was much like that found in other stunted populations, with girls in their late teens still being significantly short of their eventual adult height. But young Londoners on ships where numbers were small were clearly on a higher growth path than the one that had been taken by

¹ Jackson, *Daughters of the poor*, Nicholas and Steckel, 'Heights', Nicholas and Oxley, 'Living standards', Oxley, *Convict maids*. Heights on arrival are recorded in Principal Superintendent of Convicts, Bound and Printed Indents, State Archives Office of New South Wales, AO Fiches 647-744.

² Jackson, *Daughters of the poor*, pp. 163-4.

³ Jackson, 'Sickness and health'.

the average adult convict, for girls of seventeen and eighteen, with several years of potential growth still ahead, were already as tall as many of the grown women around them.

Data on height on arrival however can only take us so far. On their own, the heights recorded in the indents give no direct indication either of how much each girl had grown since her arrest or of the alternative growth path she might have followed had she remained at liberty in London. But the records of the penal system itself provide the means of making further progress. Almost all of the London-born convicts were held in Newgate in the interval between their arrest and their eventual transportation. Their heights on arrest are therefore usually to be found in the Newgate prison registers.⁴ Comparing the heights of individual convicts recorded on their entry into Newgate with those recorded in the convict indents on their arrival in New South Wales allows us to estimate for the first time the amount by which each of them grew in the intervening period, and comparing this growth with that implicit in the Newgate height-age profile for the same set of girls also allows us to say something directly about the relative strength of the inducements to bodily growth in captivity and among the free population from which the convicts were drawn.

Data

Usable height measurements for 802 English-born females who entered Newgate between 1825 and 1840 and who were under the age of fifty on arrival in New South Wales have so far been located in both the prison registers and the indents.⁵ This represents about 90 per cent of the London-trying English convicts sent to New South Wales during this period. Unfortunately, even a cursory inspection of the two sets of recorded heights reveals that convicts were measured differently in Newgate and New South Wales, since those aged 23-49 (who were old enough to have completed their growth and yet young enough for shrinkage to have been unimportant) were an average of six-tenths of an inch taller in the prison registers than in the convict indents. Measurement practice also appears to have changed over time in both places.

⁴ The prison registers used in this paper are held in The National Archives of the UK (TNA): Public Record Office (PRO), PCOM 2/201-06.

⁵ Twenty observations were rejected because the heights recorded in the registers and the indents are seriously inconsistent with each other, presumably because of clerical error. Nineteen of the convicts concerned were adults for whom inconsistency is defined as a difference of plus or minus two or more inches after making the adjustments described below. The entries for one sixteen-year-old were also considered unreliable because they implied an implausibly rapid increase in height of four inches in less than five months.

The first task, therefore, is to adjust the original recorded heights to make them roughly comparable both between Newgate and New South Wales and between one year and another at each location.

The regressions in tables 1 and 2 are one means of doing this. The first regression in table 1 shows that the later a woman was born the shorter her recorded height on entry into Newgate was likely to be. But this was not really a matter of the changing conditions into which successive cohorts of Londoners had been born, as we might be tempted to conclude. Rather, it reflected an increase in the proportion of the London-born in the sample (Londoners being shorter than women from other parts of the country), together with a change in measurement practice that seems to have occurred in 1836. Thus the reduction in Newgate heights that is apparent in the first regression disappears once birthplace and the measurement regime in force at the time a convict was measured are allowed for, as the second regression shows. The lack of a time trend in height in this second regression is important, since it suggests that the conditions affecting bodily growth were largely unchanged over the period in which the convicts in the sample were growing up, and this allows us to use the Newgate heights of the younger convicts as an indicator of the average rate of bodily growth among the poor from one year of age to the next. For the moment however the main focus of interest in table 1 is the estimated coefficient on the binary variable for convicts measured before the beginning of May 1836, which suggests that a change in measurement regime at around this time reduced average recorded height by about half an inch.⁶

Measurement practice also changed in New South Wales, but in this case there was no once-for-all change in procedure but an occasional switching backwards and forwards from one batch of arrivals to the next that seems to have depended upon whether or not the convicts were measured in their shoes.⁷ Because this switching occurred more or less haphazardly over time an allowance for it has no effect on the estimated time trend in recorded height on arrival in the colony, which, as the regressions in table 2 show, is in any case insignificantly different from zero. The

⁶ This interpretation is confirmed by separate regressions of height on birthplace and year of birth for the periods before and after the beginning of May 1836. In neither subperiod was the coefficient on year of birth significantly different from zero. (The coefficients are -0.016 and 0.001, with p-values of 0.38 and 0.96 respectively.)

⁷ Jackson, *Daughters of the poor*, pp. 11-13.

final regression in the table suggests that measurement in shoes made a difference of about three-quarters of an inch to average recorded height.

The regressions in both tables 1 and 2 are run on exactly the same set of convicts, and all were of an age for their height to have been the same on arrival in the penal colony as it had been at time of their arrest. If measurement practice had been the same in Newgate and New South Wales their average recorded height would also have been the same in both places. That this was not so is obvious from the coefficients on the constant terms in the final regressions in tables 1 and 2, which differ by about half an inch even after allowing for the changes in measurement regimes already discussed. In the absence of specific knowledge of measurement procedures, the source of this difference can only be guessed at. Some part of it might have been due to fact that the New South Wales heights were usually recorded to the quarter-inch while those in Newgate were invariably taken to the whole inch. There may also have been different conventions about whether to take heights to the nearest convenient mark or to the last completed interval, or it may be that different measuring equipment was used at different times or in different places. A further possibility is that Newgate heights were taken in street shoes throughout, that a change in fashion reduced a one-inch heel on the average boot or shoe to half an inch in the spring of 1836, and that the New South Wales convicts (who were issued with shoes on embarkation and again on arrival) were measured sometimes barefoot and sometimes in standard shoes with a heel of three-quarters of an inch.

But whatever the source of these differences in measurement practice the regressions in tables 1 and 2 leave no doubt about their existence. The same regressions also suggest a strategy for overcoming the lack of comparability in the original data. Suppose we ask what height might have been recorded for each convict had each of them been measured barefoot and to the quarter-inch. The constant term in the final regression in table 2 is the estimated height of the rural-born who were measured without shoes in New South Wales, and the constant in the final regression in table 1 is the estimated height of the rural-born convicts measured in Newgate after the end of April 1836. For the latter group, the difference between these two constant terms is 0.55 inches. This suggests that reducing each Newgate height in this group by half an inch is a reasonable way to represent how height might have been recorded if the Newgate authorities had followed the procedures adopted for those convicts who were measured without shoes in New South Wales. Similarly, the coefficient on the

binary variable for convicts measured in Newgate before May 1836 suggests their heights should be reduced by a further half an inch, making a total reduction of an inch for these convicts. Finally, table 2 suggests that reducing the heights of those convicts who were measured in New South Wales in their shoes by three-quarters of an inch would bring them into line with those who were measured unshod. The effect of these adjustments is to reduce average height in both Newgate and New South Wales and to eliminate the difference in average height on arrest and arrival in the colony that is evident in the original sources.⁸

Height-age profiles

We now turn to the younger London-born convicts. Once their recorded heights are adjusted as outlined above it becomes possible to compare each girl's estimated height on arrest with her estimated height on arrival in the penal colony. First, however, it is useful to examine the height-age profile evident in the adjusted Newgate heights, since this provides an indication of the average rate of growth at each age in the free population that the transported convicts were leaving behind. Given the small number of observations – a total of only 270 girls aged between 15 and 23 at the time of their arrest – little faith can be placed in the calculated average height at each individual year of age considered separately. But there are enough observations to justify the fitting of a curve such as the one estimated in table 3, where each convict's adjusted height is regressed on the natural logarithm of her age. Here, the logarithmic form is convenient because it ensures a gradual slowing down in growth over the ages in question.⁹ The curve fitted to the Newgate heights indicates the approximate average height that any large group of convicts can be expected to have reached at any particular age in the conditions generally met with among the poor in London. The change in fitted height between adjacent ages can also be taken as an indicator of the amount by which average height can be expected to have increased over the relevant age range had these girls continued to lead the lives they had so far led instead of being sent to Australia.

⁸ When these adjustments are made the average height of the convicts in the sample falls from 61.59 to 60.70 inches in Newgate, and from 60.98 to 60.67 inches in New South Wales.

⁹ Since the rate of increase in height generally begins to slow down before the onset of menstruation, and since the average urban girl of the 1830s had her first period at about the age of fifteen, most of the fifteen-year-olds in the sample can be expected to have been some way past the peak of their adolescent growth spurt at the time of their arrest. (Jackson, *Daughters of the poor*, pp. 107-15.) In the normal course of events their average rate of growth can therefore be expected to have continued to decline steadily until they reached their eventual adult height.

If the conditions facing the London convicts had remained the same after their arrest as those they had already experienced at home, the height-age profile estimated from their adjusted heights and ages on arrival would have been the same as that estimated from the adjusted Newgate heights. Naturally, the New South Wales profile in table 3 converges to the adult Newgate height, as it must given the adjustments made to the data. But the value of the intercept is higher and the estimated slope lower, indicating that on their arrival in New South Wales the convicts in the sample were generally taller for their age than the Newgate profile would have led us to expect. Figure 1 shows the implications of the two profiles for girls turning eighteen at the time of their arrest. On average these girls would have reached point A on the Newgate profile when taken into custody, and had the law not intervened they would have gone on to reach point B nine months later. Instead, their growth followed the path AC, implying extra growth after their arrest equal to the amount BC. What happened thereafter would of course have depended upon the conditions they then encountered in New South Wales, about which the age profile of height on arrival can provide no clues. Indeed, the latter is not strictly a height-age profile at all. Because it is dominated by the effects of a temporary upheaval in the life of these girls that would not be repeated while any were still growing, the New South Wales curve in figure 1 does not represent a path along which any group of arriving convicts can be said to have moved. Rather, it represents a series of points reached by girls of various ages who had on average grown more quickly since their arrest than they would otherwise have done.

Growth in prison and on the voyage

A direct comparison of the adjusted heights of individual girls in Newgate and New South Wales allows us to go further. Figure 2 shows the average change in height at each year of age on arrest between 15 and 23 for the 270 London-born convicts for whom a reasonably reliable comparison between height on arrest and height on arrival can be made. Undoubtedly, many of the individual changes on which the averages are based are incorrect, since only the most obvious cases of inconsistent measurement are excluded from the sample. Given the small number of observations, however, it is better to risk being led astray by random errors than to reduce the prospect of identifying patterns in the data by restricting the sample still further.

To an extent the pattern in figure 2 is as we might have expected, with the average rate of increase in height falling with age and eventually ceasing altogether from 22 onwards. But there is also an unexpected irregularity at ages 20 and 21, when the rate of increase in height between arrest and arrival rises briefly before subsiding to zero at age 22. This late burst of growth makes it advisable to analyse the increase in height at age 20 onwards separately from the increase at younger ages, where the pattern suggested by figure 2 is more in line with our expectations.

The first regression in table 4 is therefore confined to those convicts who were aged 15-19 at the time of their arrest. Clearly, the rate of growth of these younger convicts varied systematically with age and with the height a girl had already attained on arrest. The older a girl was, and the taller she was for her age, the slower her rate of growth tended to be. This suggests the existence of an underlying relationship between the growth rate and the stage of development a girl had already reached, rather than between growth and chronological age as such. The second regression shows a similar inverse relationship between height on arrest and the subsequent rate of growth of the convicts aged 20-21. Age is excluded from this second regression however because there was no relationship between age and growth among this group of convicts, as a glance at figure 2 confirms.

Table 3 and figure 1 have already shown that the convicts appear to have grown faster after their arrest than they would have done had they remained at large in London. But we also know that height on arrival varied inversely with the number of convicts on board the ship on which a girl travelled to Australia. It is no surprise, therefore, to find a similar relationship present in both of the regressions in table 4. Both groups of girls grew more slowly when numbers were large, and to roughly the same extent.¹⁰

¹⁰ Since numbers on board increased over time, the regressions in table 4 might equally have used date of arrest as an independent variable in place of the number of convicts. The downward trend in the rate of bodily growth during the 1830s is itself an important part of the story, and it may well be that changes in the prison system rather than on the convict ships were partly responsible for this. Given the close relationship between numbers on board and the trend in the sickness rate during the voyage (Jackson, 'Sickness and Health'), however, it seems preferable to proceed for the moment as if the increase in the average number on board were the basic cause of the slowing in the rate of growth. But this is no more than a preliminary expositional device, and at some stage a fuller treatment will obviously be necessary.

What next?

This however is no more than a beginning. Inconsistencies in the data have been cleared away, and a preliminary analysis of the adjusted Newgate and New South Wales heights has provided welcome confirmation of what to this point had been merely suspected. We can now be reasonably confident that the typical London-born girl transported to New South Wales experienced a net improvement in the conditions affecting bodily growth in the interval between her arrest and her arrival in the penal colony, and that the extent of this improvement depended in part upon the number of convicts on the particular ship on which she happened to travel. But much remains to be done. Establishing the favourable initial effect of transportation on Londoners, who were by far the shortest people in England, is relatively straightforward. With less stunted populations, such as the rural-born, the task is likely to be more difficult because conditions were less inimical to growth in the countryside, so that any improvement can be expected to have been correspondingly smaller and harder to detect. Almost all the rural convicts passing through Newgate, moreover, were by that time living in London, and since they were still growing their heights on arrest were the product partly of conditions in their birthplace and partly of those in London itself. Other questions also arise. We need, for example, to try and go beyond mere numbers on the outward voyage as an influence on shipboard conditions, and to see whether the effects of life in Newgate (where the convicts spent half the time between arrest and arrival) can be separated from those of life on the high seas. It may be of course that the smallness of the sample size frustrates the pursuit of answers to these and other questions, but the patterns already uncovered in the Newgate data are clearly strong enough to make it worth pressing on.

Table 1. Newgate measurement regimes

Dependent variable is the recorded height in inches of female convicts aged 23-49 on entry into Newgate. OLS with standard errors in parentheses and p-values in brackets.

Constant	121.0559 (27.8864) [.000]	82.5121 (28.0687) [.004]	62.0577 (0.2702) [.000]
Date of birth	-0.0330 (0.0155) [.034]	-0.0113 (0.0155) [.467]	
Born in London		-1.7936 (0.2419) [.000]	-1.8141 (0.2401) [.000]
Born in other urban areas		-0.9361 (0.3365) [.006]	-0.9329 (0.3363) [.006]
Measured before 1 May 1836		0.5086 (0.2818) [.072]	0.5771 (0.2655) [.030]
R ²	0.0109	0.1327	0.1316
F (416 observations)	4.5472 [.034]	15.7231 [.000]	20.8108 [.000]

Sources: See text.

Table 2. New South Wales measurement regimes

Dependent variable is the recorded height in inches of female convicts aged 23-49 on arrival in New South Wales. OLS with standard errors in parentheses and p-values in brackets.

Constant	98.5922 (27.1274) [.000]	84.7501 (25.4972) [.001]	61.5118 (0.1851) [.000]
Date of birth	-0.0209 (0.0151) [.166]	-0.0129 (0.0142) [.363]	
Born in London		-1.6977 (0.2329) [.000]	-1.7222 (0.2313) [.000]
Born in other urban areas		-0.8342 (0.3252) [.011]	-0.8337 (0.3251) [.011]
Measured in shoes		0.8003 (0.2185) [.000]	0.7843 (0.2178) [.000]
R ²	0.0046	0.1442	0.1425
F (416 observations)	1.9223 [.166]	17.3116 [.000]	22.8147 [.000]

Sources: See text.

Table 3. Height in Newgate and New South Wales, London-born female convicts aged 15-23.

Dependent variable is height in inches of convicts aged 15-23 on arrest, adjusted as explained in the text. OLS with standard errors in parentheses and p-values in brackets.

	Newgate	NSW
Constant	48.9238 (3.7979) [.000]	55.1127 (3.7510) [.000]
Ln (age on arrest)	3.4856 (1.2811) [.007]	
Ln (age on arrival)		1.4816 (1.2503) [.237]
R ²	0.0269	0.0052
F (270 observations)	7.4034 [.007]	1.4042 [.237]

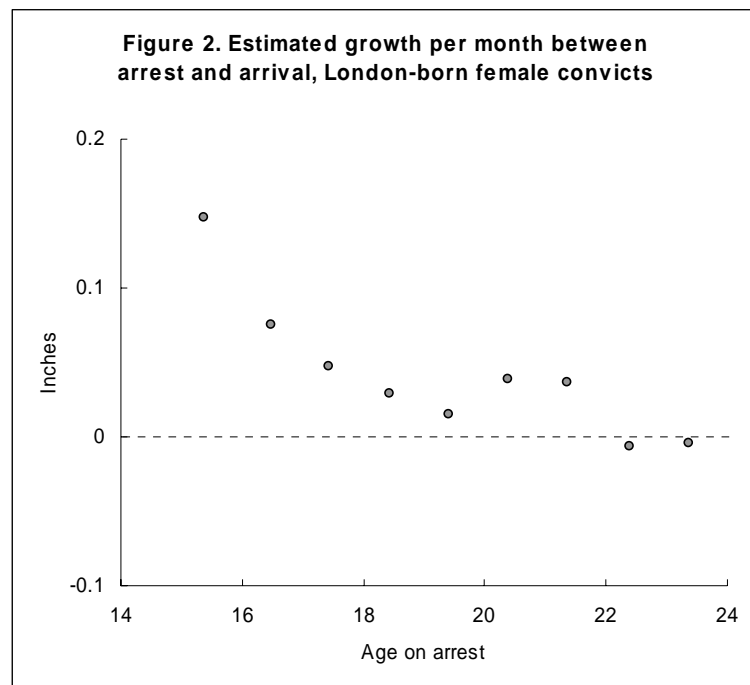
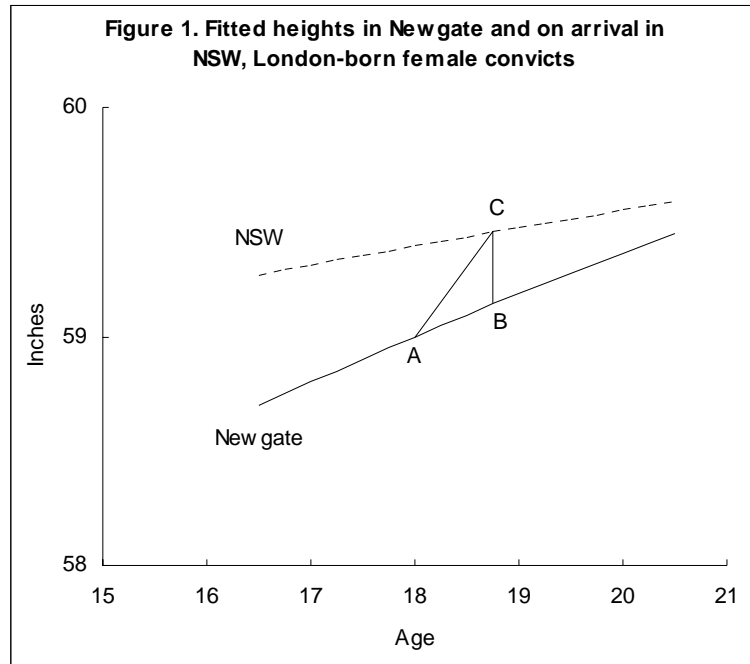
Sources: See text.

Table 4. Increase in height between arrest and arrival in New South Wales, London-born female convicts aged 15-21 on arrest

Dependent variable is the change in adjusted height in inches divided by the number of months between arrest and arrival. OLS with standard errors in parentheses and p-values in brackets.

	Ages 15-19	Ages 20-21
Constant	1.5108 (0.2012) [.000]	1.0305 (0.2686) [.000]
Age on arrest	-0.0198 (0.0064) [.002]	
Height on arrest (inches)	-0.0177 (0.0033) [.000]	-0.0157 (0.0044) [.001]
Convicts on board	-4.6E-4 (2.1E-4) [.030]	-5.0E-4 (2.8E-4) [.078]
Observations	154	70
R ²	0.2740	0.1753
F	18.8671 [.000]	7.1202 [.002]

Sources: See text.



Footnote references

- Jackson, R.V., *Daughters of the poor* (Melbourne, 2005).
- , 'Sickness and health on Australia's female convict ships, 1821-40', *International Journal of Maritime History* (forthcoming) .
- Nicholas, S. and Oxley, D., 'The living standards of women during the industrial revolution, 1795-1820', *Economic History Review*, XLVI (1993), pp. 723-49.
- Nicholas, S. and Steckel, R.H., 'Heights and living standards of English workers during the early years of industrialization, 1770-1815', *Journal of Economic History*, 51 (1991), pp. 937-57.
- Newgate Prison Registers, The National Archives of the UK (TNA): Public Record Office (PRO), PCOM 2/201-06.
- Oxley, D., *Convict maids: the forced migration of women to Australia* (Melbourne, 1996).
- Principal Superintendent of Convicts, Bound and printed indents, Archives Office of New South Wales, AO Fiches 647-744.