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European Heights in the Early 18th Century


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European Heights in the Early 18th Century


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European Heights in the Early 18th Century

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Abstract: We estimate the height of various European populations in the first half of the 18th century. English and Irish male heights are estimated at c. 65 inches (165 cm), and c. 66 inches (168 cm) respectively. These values are below those obtained from the only other sample available for the period pertaining to British and Irish men, namely those of runaway indentured and convict servants in colonial North America, whose height is estimated as between 66.4 and 67.0 inches (168.7 and 170.2 cm). At c. 64.5 inches (164 cm) Saxon, German and Scotch military heights appear to be near the bottom of the European height distribution in this period. The English were about as tall as Bohemians and French, but shorter than the Irish and Hungarians. A large decline in English heights is evident among the birth cohorts of 1725-29, suggesting that the subsistence crisis of this period must have had a substantial lasting impact on the nutritional status of the cohort born during a time of nutritional deprivation.

Introduction

Evidence on human physical stature is rare for the early 18th century. There are two exceptions, however. The French army was the first to record systematically the height of soldiers beginning with 1716 (Komlos et al. 2003), and the Saxon military followed suit in the 1730s (Hauptstaatsarchiv Dresden, Musterlisten). Yet, other evidence is scarce. In contrast, data for the second half of the century are plentiful, and these do provide some information on the height of men born beginning with the 1730s. In addition to the military,
the institutions of indentured and convict servitude also provide some scattered evidence on
European physical stature, inasmuch as a number of servants ran away from their owners,
and advertisements in North American newspapers seeking their return did often mention the
servants’ physical description (Komlos 1993a, 1999). Hence, the extant information on
Europeans serving in North American armies is a significant source for the physical stature
of men born in this period.¹

The evidence assembled thus far indicates that biological welfare declined after the
Middle Ages and reached a nadir in France, and quite likely in the rest of Europe as well, in
the 17th century (Steckel 2004; Komlos et al., 2003). Living conditions improved thereafter
reflecting improvements in climatic conditions and in agricultural productivity. Europeans
were markedly shorter than the inhabitants of the New World throughout the 18th century –
by as much as 3-10 cm (1-4 inches) and remained smaller than Americans during the
subsequent two centuries, though the gap disappeared by the mid-20th century (Komlos 2001;
Komlos and Baur 2004). This is even true for slaves (Komlos 1994). Europe, moreover, was
about to experience a demographic explosion in the second half of the century which put
downward pressure on food consumption with the consequence that the height of the
population diminished after mid-century. This was the case everywhere in Europe so far
examined: Ireland, Scotland, England, Bohemia, Galicia, Moravia, Hungary, Lower Austria,
France, Bavaria, Sweden and Northern Italy (A’Hearn, 2003; Heintel, Steckel and Sandberg,
1998; Komlos 1985, 1989, Sandberg and Steckel 1987). Thus, the history of human height
in the 18th century is one of recovery from 17th century lows, followed by a decline as the
population’s nutritional status diminished, brought about by increasing food prices and a shift
away from protein consumption. While the 17th century nadir was never again reached, and a
subsistence crisis was ultimately averted, in many cases not until the turn of the 20th century
did European heights exceed the levels of the early 18th century. We now turn to new
evidence on Europeans serving in North American armies and of soldiers serving in the army of Saxony in order to expand our knowledge of the first half of the 18th century.

Data

Nearly 5,000 data were collected pertaining to the militias and armies of Connecticut, Maryland, New York and Virginia (Table 1). Almost all (86%) of those adults (51 > age >22) who could be identified as European-born were from the United Kingdom, with Germany being the only other European country sufficiently represented to estimate mean height. Most of the height distributions deviate markedly from normality: minimum height requirement (MHR) of 64 inches appears to have been generally enforced (Figure 1). In addition, the height distributions of the English soldiers seem to have a shortfall also above 68 inches. This must have been the case because tall sailors were disadvantageous aboard ships, and as a consequence, fewer tall sailors were admitted into the Royal Marines and presumably also into the merchant marine (Komlos 1993b). To be sure, the Irish height distribution appears to be nearly normal (Figure 2), albeit this is not the case for sub-periods (not shown here).2 The MHR of 64 inches is also evident among the German and Scottish soldiers (Figures 3 and 4). In the latter case, however, the maximum height requirement of 68 inches is also evident.

In addition, c. 10,000 records on adult soldiers were extracted from the State Archive in Dresden, Saxony, in order to estimate the trend in the height of the male population. The height distributions show the enforcement of a MHR of 72 Saxon inches (169.9 cm) (1 Saxon inch = 2,36 cm) (Figure 5). The MHR was probably above the mean height of the population. In such cases A’Hearn (2004) has shown that the best results are obtained with using truncated regression, restricting the standard deviation to the modern value of 6.86 cm (Komlos 2004).
Results

The estimated mean height of English, German, and Scottish soldiers are (65.3, 64.9, 64.4 inches c. 163.6-165.9 cm) respectively for the period as a whole, while that of the Irish is somewhat greater, 66.1 inches (167.9 cm) (Table 2). Because of the small number of observations, the trends can be estimated only for height of the English, Irish and Saxon soldiers. The OLS results for the English and Irish heights are reported in order to show that the truncated regression estimates provide similar trends, though the levels are lower (Figure 5). While they are estimated independently, the Irish and English trends are similar, even if the Irish tend to be taller by about an inch. There is a very large decline in English heights in the 1725-29 quinquennium, and then again a slight decline in the 1740s and 1750s. Irish heights also dipped during the 1725-29 quinquennium. While the decline in height of the late 1720s appears implausibly large amongst the English, it is likely that nutritional status did decline in this period on account of the substantial subsistence crisis that struck the kingdom in 1729. The crude death rate increased from 28 to 36 in this quinquennium, never to reach that level again² (Wrigley et al., Ch. 8 and Table A9.1, 1997). Moreover, real wages declined in 1729 by c. 15% compared to 1727 and then rebounded by 24% by 1731 (Phelps Brown and Hopkins 1962). Hence, the decline in height in the late 1720s is plausible based on the evidence of mortality rates and real wages.

Table 2 and Figures 5 about here

Conclusion

In some respects the new evidence on heights in the early 18th century does fit well into the hitherto known pattern, but in other respects it does not. The general trend agrees with those handful of estimates that do exist for this period: France, Bohemia, and Hungary, except that French mean heights are lower before 1725, and do not decline in the 1725 quinquennium as in the United Kingdom (Figure 6). Moreover, generally, agricultural populations tended to be taller than those regions which were more urbanized and more
advanced on the road to industrialization. Hence, Hungary had a taller population than Bohemia in the period considered (Figure 7), and in the current sample, too, Irishmen were taller than Englishmen. A similar pattern was found in a sample of convict servants of the late 18th century: English men were 65.8 inches (167 cm) Irishmen were 66 cm (167.6 cm) (Nicholas and Steckel, 1991, Table 4). The Irish advantage – at about half an inch - persisted into the 19th century (Floud et al. 1990, p. 201; Komlos, 1993b Figure 6; Mokyr and O’Grada, Table 5; Nicholas and Oxley 1993). The height of Saxon soldiers also fits into this pattern insofar as it had a relatively low-productive agricultural sector, but with widespread proto-industrial activity (Table 2 and Figure 8). In contrast, Hungary and Ireland had higher agricultural productivity- and higher per capita consumption of nutrients.

Figures 6-8 about here

For the first time we have extensive evidence on the height of the German population in the early 18th century. Both samples, the German soldiers serving in North America, and the soldiers serving in the Saxon army indicate that German men were relatively short by contemporary standards, implying that perhaps living conditions in Germany were particularly bad at the time (Figure 8). The height of German runaways was 65.7 cm (166.8 cm) 0.8 in (2 cm) taller than that of the soldiers (Table 2).

The Irish indentured servants (N=1,186) (66.4 in 168.7 cm) were about as tall as the Irish soldiers (66.1 in or 167.9 cm) (Table 2). Yet, the height of the English soldiers in this sample are well below those obtained in the only other extant sample for this period pertaining to English men, those of the runaway indentured and convict servants in colonial North America (Komlos 1993a; 1999, Table 4). The English runaway servants (N=590) at 67.0 inches (170.2 cm) – were 1.7 inches (4.3 cm) taller than the soldiers in the above military sample4 (Table 2). One can merely speculate about the reason for this discrepancy. Do the results pertain perhaps to different segments of the lower classes, different urban/rural provenance, or perhaps were those servants who ran away from their masters much taller
than average? And why is this the case for the English servants but not for the Irish servants?
Although one might think that the soldiers were more representative of the population of the
United Kingdom than were the runaway servants, it is not necessarily the case, given the
existence of the maximum height requirement applied to sailors and royal marines. Given
that mean heights are difficult to estimate accurately when only a small range of heights are
available from the original height distribution, as in this case - between 64 and 68 inches,- the
extent to which this sample should be considered representative of the population of the
United Kingdom is not at all obvious. Yet, because we cannot be sure that the heights in this
sample are downwardly biased, they do cast some doubt on the substantial decline in heights
found in many other European samples during the second half of the century. This is the
case, because the height of convict servants transported to Australia toward the end of the
century was about the same as those found in this sample of English soldiers (Nichols and
Steckel 1991). Hence, more anthropometrical research is needed before we will have a
clearer understanding of the cycles and trends in the height of the British population in the
18th century. Because of the rarity of such evidence for the period under consideration, it is
useful to consider the evidence at hand in spite of its imperfections. It is probable, though
that the populations in the proto-industrial areas of Bohemia, Saxony, and the industrially
advanced England were among the shortest in Europe during the first half of the 18th century.
## Table 1. Characteristics of the sample

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<td>farmer, yeomen</td>
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<td>Planter, gentlemen</td>
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<td>other incl. soldier, sailor</td>
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<td>NY</td>
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<th>Percent</th>
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<td>668</td>
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<td>1720-24</td>
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<td>757</td>
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<td>1730-34</td>
<td>1312</td>
<td>26,4</td>
<td>1730-34</td>
<td>1211</td>
<td>31,6</td>
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<td>1735-39</td>
<td>1101</td>
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<td>1750s</td>
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<th>Provenance</th>
<th>Frequency</th>
<th>Percent</th>
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<td>38,2</td>
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<td>1523</td>
<td>39,7</td>
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<td>England</td>
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<td>649</td>
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<tr>
<td>Scotland</td>
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<td>Scotland</td>
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<td>Other</td>
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<td></td>
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<tr>
<td>Spain, Portugal</td>
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<td></td>
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<td>Scandinavia</td>
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<td>0,5</td>
<td></td>
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<td></td>
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<tr>
<td>Italy</td>
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<td>Denmark</td>
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<td>45</td>
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<tr>
<td>18</td>
<td>89</td>
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<tr>
<td>19</td>
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<td>21</td>
<td>234</td>
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<td>22</td>
<td>285</td>
</tr>
<tr>
<td>Adults (23-50)</td>
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<tr>
<td>&gt;50</td>
<td>62</td>
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</table>

*Source: See Data Sources in list of References.*
Table 2. Height of Adult Men: birth cohort c.1735-1739

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<tr>
<th>Country of Birth</th>
<th>Inches</th>
<th>Cm</th>
<th>Residence</th>
<th>Inches</th>
<th>Cm</th>
<th>Residence</th>
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<td>171.0</td>
<td>N. America</td>
<td>66.4</td>
<td>168.7</td>
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</tr>
<tr>
<td>Ireland</td>
<td>66.1</td>
<td>167.9</td>
<td>N. America</td>
<td>66.4</td>
<td>168.7</td>
<td>N. America</td>
</tr>
<tr>
<td>Hungary</td>
<td>65.9</td>
<td>167.4</td>
<td>Hungary</td>
<td>65.4</td>
<td>166.1</td>
<td>Bohemia</td>
</tr>
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<td>France</td>
<td>65.8</td>
<td>167.1</td>
<td>France</td>
<td>65.7</td>
<td>166.8</td>
<td>N. America</td>
</tr>
<tr>
<td>Bohemia</td>
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<td>166.1</td>
<td>Bohemia</td>
<td>67.0</td>
<td>170.2</td>
<td>N. America</td>
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<td>N. America</td>
<td>65.7</td>
<td>166.8</td>
<td>N. America</td>
</tr>
<tr>
<td>Germany</td>
<td>64.9</td>
<td>164.8</td>
<td>N. America</td>
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</tr>
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<td>64.4</td>
<td>163.6</td>
<td>N. America</td>
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</table>

Note: Indentured and Convict Servants.
Sources: Komlos 1989, 1999, 2001; Komlos et al. 2003, See also list of references for Data sources.

Figure 1. Height Distribution of Adult English Soldiers in America.

Note: Number of observations = 1359.
Figure 2. Height Distribution of Adult Irish Soldiers in America.

Note: Number of observations = 1812.

Figure 3. Height Distribution of Adult German Soldiers in America.

Note: Number of observations = 814.
Figure 4. Height Distribution of Adult Scottish Soldiers.

Note: Number of observations = 412.

Figure 5. Height Distribution of Adult Saxon Soldiers.

Note: Number of observations 14083. Saxon Inches = 2.36 cm.
Figure 6. Height of Adult English and Irish Men

![Graph](image)

Note: X-axis shows birth-cohort; left axis height in inches, right axis in centimeters.

Figure 7. Height of Adult European Men

![Graph](image)

Note: X-axis shows birth-cohort; left axis height in inches, right axis in centimeters.
Figure 8. Height of Adult European Men

Note: X-axis shows birth-cohort; left axis height in inches, right in centimeters. Saxon and Russian Inches have been transformed into British Inches. Russian data are courtesy of Boris Mironov.
Data Sources


Hauptstaatsarchiv, Dresden, Germany. Musterlisten.

Maryland Settlers and Soldiers, CD, Genealogical Publishing Company:  

New York in the Colonial Wars, the Revolution and the War of 1812: CD, Genealogical Publishing Company:  

Virginia Military Records: Colonial Wars, Revolutionary War, War of 1812, CD, Genealogical Publishing Company:  

References


Biological Standard of Living in Comparative Perspectives: Proceedings of a Conference


Evidence on women in larger numbers first appeared in 19\textsuperscript{th}-century penitentiaries. However, the Irish heights did not yield reasonable estimates when the maximum height requirement of 68 inches was used. For the whole period after 1536 there was only one quinquennium during which the crude death rate was above this level. These estimates were obtained using truncated regression with standard deviation set to 2.7 inches (A’Hearn 2004). The height distribution indicates that perhaps taller servants had a greater propensity to runaway from their masters. Hence, a Minimum Height requirement of 65.5 inches was used in this estimation procedure. The results were not meaningfully different from the OLS calculations reported in (Komlos 1999). The number of observations on the Scottish is too small (N=107) to draw robust conclusions.