

Weather, height and environmental conditions in Spain since c. 1850

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During the last 40 years, economic and social historians have collected and analysed large amounts of anthropometric data in order to explore key aspects of the human past. Attention has also been devoted to the examination of factors that can exert influence on stature. Some examples include diseases, inequality, urbanisation and food prices (Steckel, 2009; Floud, *et al.*, 2011). Yet, the extent to which meteorological factors may have influenced height has not been examined in the same detail. This article begins by outlining the different ways in which weather might influence stature in Spain, both indirectly through its impact on diet, disease and work intensity; and directly, because weather can influence the number of calories needed for basal metabolism.

This article then examines the extent to which changes in weather are reflected in historical height statistics using a large collection of height data derived from military conscript records from south Spain and Levante (Martínez-Carrión, 2002; Puche-Gil, 2011). We compare changes in the average adult heights of men in Spain with variations in temperature and precipitation since 1850. This is carried out using high-resolution climatic data (Harris, *et al.*, 2014) and linking the height data with their climatic correlates more accurately than has been possible hitherto, through the use of Geographical Information Systems (GIS) software locating individuals in the height sample in space and matching their location to geographically indexed climatic data.

Using bivariate and multivariate analysis, we find that weather conditions have an influence on stature in Spain, especially during the 19th century, but the relationship weakens across time and largely disappears in decades close to the present. We consider the cause of this result to be a process of *technophysio evolution* –the synergism between rapid technological change and the improvement in human physiology– as developed by Fogel and Costa (1997). Rapid economic growth and social and technological change over recent decades may have weakened the relationship between natural factors, such as weather, and height as a result of mankind's increasing ability to control his environment. However, we can speculate that the effects of anthropogenic climate change may become more evident in the near future (Floud, *et al.*, 2011).

References:

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