



IQ and socio-economic development across local authorities of the UK



Noah Carl

Nuffield College, New Road, Oxford OX11NF, United Kingdom

ARTICLE INFO

Article history:

Received 17 December 2015

Received in revised form 3 February 2016

Accepted 3 February 2016

Available online xxxx

Keywords:

Intelligence

Cognitive ability

Local authorities

UK

Socio-economic development

ABSTRACT

Cross-regional correlations between average IQ and socio-economic development have been reported for many different countries. This paper analyses data on average IQ and a range of socio-economic variables at the local authority level in the UK. Local authorities are administrative bodies in local government; there are over 400 in the UK, and they contain anywhere from tens of thousands to more than a million people. The paper finds that local authority IQ is positively related to indicators of health, socio-economic status and tertiary industrial activity; and is negatively related to indicators of disability, unemployment and single parenthood. A general socio-economic factor is correlated with local authority IQ at $r = .56$. This correlation increases to $r = .65$ when correcting for measurement error in the estimates of IQ.

© 2016 Published by Elsevier Inc.

1. Introduction

Cross-regional correlations between average IQ and indicators of socio-economic development have been documented in numerous countries: the UK (Lynn, 1979; Carl, 2015; Kirkegaard, 2016); France (Lynn, 1980); Italy (Lynn, 2010; Templer, 2012; Piffer & Lynn, 2014; but see Beraldo, 2010; Cornoldi, Belacchi, Giofrè, Martini, & Tressoldi, 2010; Cornoldi, Giofrè, & Martini, 2013; D'Amico, Cardaci, Di Nuovo, & Naglieri, 2012; Daniele & Malanima, 2011a; Felice & Giugliano, 2011; Daniele, 2015); Portugal (Almeida, Lemos, & Lynn, 2011); Spain (Lynn, 2012); Germany (Roivaninen, 2012); Finland (Dutton & Lynn, 2014); Japan (Kura, 2013); China (Lynn & Cheng, 2013); India (Lynn & Yadav, 2015); the US (McDaniel, 2006; Pesta, McDaniel, & Bertsch, 2010; Barnes, Beaver, & Boutwell, 2013; Boutwell et al., 2013); Turkey (Lynn, Sakar, & Cheng, 2015); Brazil (Fuerst & Kirkegaard, 2015), Mexico (Fuerst & Kirkegaard, 2015), and Russia (Grigoriev, Lapteva, & Lynn, 2016). Average IQ is correlated with socio-economic development not only within countries, but also across them (Jones & Schneider, 2006; Meisenberg & Lynn, 2011; Rindermann & Thompson, 2011; Rindermann, 2012; Lynn & Vanhanen, 2012a; Lynn & Vanhanen, 2012b; Wicherts, Borsboom, & Dolan, 2010a).

There is a lively and ongoing debate over the direction of causality between average IQ and socio-economic development. Some have argued that most or all of the causality is from socio-economic development to intelligence (Daniele, 2013; Daniele, 2015; Wicherts et al., 2010a; Wicherts, Borsboom, & Dolan, 2010b; Sternberg, 2013; and see Diamond, 1997; Eppig, Fincher, & Thornhill, 2010; Eppig, Fincher, &

Thornhill, 2011). According to this view, certain territories started out with better institutions or geographical circumstances, and as a consequence their populations were able to develop more advanced systems of transport, food-supply, healthcare and education. Since those populations today are healthier and better educated, they tend to score higher on intelligence tests. By contrast, others have argued that at least some of the causality, perhaps most, is from intelligence to socio-economic development (Lynn & Vanhanen, 2012a; Rindermann, Woodley, & Stratford, 2012; Woodley, Rindermann, Bell, Stratford, & Piffer, 2014; Fuerst & Kirkegaard, 2015; Piffer, 2015; and see Murray, 2003; Clark, 2007). According to this perspective, certain populations started out with higher intelligence, and as a result, they gradually built up institutions that were conducive to socio-economic development, such as stable government, secure property rights, and wholesale scientific inquiry. Ultimately, variance in socio-economic development among territories must be decomposable into variance due to initial geographic endowments, variance due to genetic proclivities, and variance due to random contingency.

It is also worth noting that intelligence is, of course, robustly associated with measures of socio-economic status at the individual level—not only education, job performance, occupational prestige and income, but health and longevity as well (Herrnstein & Murray, 1994; Gottfredson, 1997; Strenze, 2007; Deary, 2012). These associations are thought to reflect both a direct effect of intelligence—individuals with greater cognitive ability being better able to synthesise information, draw logical inferences, and solve complicated problems—and a confounding effect of parental socio-economic status—individuals with greater cognitive ability tending to come from families with more economic resources and cultural capital (Strenze, 2007; Deary, 2012). The exact importance of these two effects remains a matter of debate, but

E-mail address: noah.carl@nuffield.ox.ac.uk.

it is unquestionable that intelligence exerts a sizable impact on a range of socio-economic status measures, not least the most widely-studied measures like education and income.

The present study does not seek primarily to stake out a position in the debate over the direction of causality between intelligence and socio-economic development. Rather, it provides yet further evidence that the two are associated within the UK, via an analysis at the local authority level. It begins by describing the data, along with the statistical methodology. It then briefly examines the distribution of local authorities by average IQ. Finally, it explores the extent to which local authority IQ is associated with, in turn: specific indicators of socio-economic development such as health, unemployment, and tertiary industrial activity; and a general socio-economic factor.

2. Methods

2.1. Data

Following Carl (2015), estimates of average IQ were computed using data from the third wave of Understanding Society—a large, ongoing longitudinal survey of British households (University of Essex, 2013). These data were collected (almost entirely) via face-to-face interviews between January 2011 and April 2013. A general factor, *g*, was obtained by extracting the first principal component from a PCA on six separate measures of cognitive ability (Spearman, 1904): immediate word recall, delayed word recall, serial subtraction, number series, verbal fluency, and numeracy. 46% of the variance across the six measures was explained by this component, which was transformed onto the IQ scale (i.e., set to have a mean of 100 and a standard deviation of 15) prior to further analysis.

For immediate word recall, respondents were required to repeat back as many words as possible from a list of ten that were read out by a computer. For delayed word recall, respondents were required to again repeat back as many of the ten words as possible, but this time after a short delay. For serial subtraction, respondents had to subtract 7 from 100, and then keep subtracting 7 from the answer four more times. For number series, respondents were asked to identify the missing number from each of six sequences; the final three sequences varied depending on the respondent's performance in the initial three. For verbal fluency, respondents were asked to name as many animals as possible in one minute. For numeracy, respondents had to solve up to five brief mathematical puzzles; the final two problems differed depending on the respondent's performance in the initial three. See McFall (2013) for additional details.

Next, average IQ was calculated for each of the 404 local authorities represented in the dataset. It is important to note that information on local authorities was obtained from the UK Data Service via a Special Licence. Therefore making these data available to other researchers is not possible. Information on local authorities are not included in the main Understanding Society dataset due to the fact that some local authorities contain relatively few respondents, which could permit identification of specific individuals. Cross-sectional sampling weights were applied when calculating regional IQs in order to attain representativeness (see Knies, 2014). In the present dataset, weighed *n*'s for IQ estimates range from 5 to 458, with a mean of 96 and a median of 81.

Local authorities are administrative bodies in local government. In England, the largest of the four UK nations, there are five types of local authority: county councils, district councils, unitary authorities, London boroughs, and metropolitan districts (Local Government Information Unit, 2015). These are responsible for such functions as education, highways, social care, housing, planning applications, libraries, and sanitation. Local authorities have three main sources of funding: grants from central government, business rates (taxes on local companies), and council tax (taxes on local households). Around 1.5 million people are employed by local authorities in England alone. The smallest local authority in the UK, West Somerset, has around 35,000

inhabitants; the largest, Birmingham City, has >1,000,000 inhabitants. The average local authority has over 100,000 inhabitants.

Local authority IQs were then matched with data on socio-economic development from the Office for National Statistics, the UK government's statistics agency (ONS, 2012; ONS, 2013; ONS, 2014). 16 separate measures of socio-economic development were utilised: proportion of households in social grades A and B¹; proportion of residents reporting good or very good health; proportion of adult residents with level 4+ educational qualifications²; life expectancy at birth; proportion of adult residents employed in the financial, information, scientific and professional industries; proportion of adult residents employed in the education sector; proportion of households with 2+ cars; average life-satisfaction rating; proportion of adult residents married or in a civil partnership; proportion of households who own their home; average anxiety rating; proportion of households in the social rented sector; proportion of single parent households; proportion of residents whose day-to-day activities are limited a lot; proportion of adult residents employed in semi-routine or routine occupations; and unemployment rate. It was not possible to locate recent, harmonised data on income for all UK local authorities. Crime data were available, but were not harmonised across the four UK nations; these will be analysed in a separate publication. Information on both IQ and all 16 indicators of socio-economic development was available for 392 local authorities.

2.2. Statistical methodology

For examining the distribution of local authorities by average IQ: the histogram is plotted; descriptive statistics are reported; and the variance is decomposed into components within and between, separately, nations and regions of the UK (see Carl, 2015). For exploring the extent to which local authority IQ is associated with socio-economic development, first the Pearson correlation between local authority IQ and each indicator of socio-economic development is calculated, and then the correlation between local authority IQ and a general socio-economic factor. A scatterplot of latter relationship is provided as a visual accompaniment.

3. Results

3.1. Distribution of local authorities by average IQ

Fig. 1 displays a histogram of local authorities by average IQ. The distribution is approximately normal, with a mean of 101, a standard deviation of 3.4, a median of 100, a minimum of 90, and a maximum of 111. Only 4% of the variance in local authority IQ is between the four UK nations (England, Scotland, Wales, Northern Ireland), while 96% is within them. And only 14% of the variance is between the twelve UK regions (East Midlands, East of England, London, North East, North West, Northern Ireland, Scotland, South East, South West, Wales, West Midlands, Yorkshire and the Humber), while 86% is within them. Some evidence for the validity of IQ estimates obtained from Understanding Society was provided by Carl (2015), who reported a very strong correlation between average IQ and average PISA scores across the four UK nations. Unfortunately, the author is unaware of any comparable metric at the local authority level. It is noteworthy, however, that Oxford and Cambridge, the two oldest and most famous university cities within the UK, are both among the top 10 local authorities when ranked by average IQ.

¹ Social grade A comprises higher managerial, administrative and professional occupations, while social grade B comprises intermediate managerial, administrative and professional occupations (NRS, 2015).

² Level 4+ educational qualifications comprise certificates of higher education, advanced diplomas, undergraduate degrees and postgraduate degrees (UK government, 2015).

Download English Version:

<https://daneshyari.com/en/article/7293410>

Download Persian Version:

<https://daneshyari.com/article/7293410>

[Daneshyari.com](https://daneshyari.com)