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First Names, Cognitive Ability and Social Status in Denmark

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It is well established that general intelligence varies in the population and is causal for variation in later life outcomes, in particular for social status and education. We linked IQ-test scores from the Danish draft test (Børge Prien Prøven, BPP) to social status for a list of 265 relatively common names in Denmark (85% male). Intelligence at the level of first name was strongly related to social status, $r = .64$. Ten names in the dataset were non-western, Muslim names. These names averaged an IQ of 81 (range 76-87) compared with 98 for the western, mostly Danish ones. Nonwestern names were also lower in social status, with a mean SES score of 2.66 standard deviations below that of western names. Mediation analysis showed that 30% of this very large gap can be explained by the IQ gap. Reasons for this relatively low level of mediation are discussed.

Key Words: Denmark, Immigration, Military testing, Intelligence

It is well established that general intelligence (henceforth, *intelligence*) varies in the population and this is known to be causal for later life social status. Evidence for this causal claim comes from a variety of research designs including parent-child and sibling comparisons, longitudinal studies, analysis of job requirements, and studies using measured DNA-based (genomic) estimates of intelligence (Gottfredson, 1997; Herrnstein & Murray, 1994; C. Murray, 2002; Marioni et al., 2014; Rindermann, 2018; Strenze, 2007, 2015; Trzaskowski et al., 2014).

Similarly, groups within a given country are known to differ in intelligence, and their relative social status mostly reflects these differences. This is true for geographic/regional differences, race/ethnic groups, and social status/class

differences (Herrnstein & Murray, 1994; Lynn, 2008; Lynn, Fuerst & Kirkegaard, 2018). Previous research has shown that names, both first and last, are related to these social divisions (Clark, 2015; Fryer & Levitt, 2004; Fuerst, 2015; Kandt, Cheshire & Longley, 2016; Liddell & Lycett, 1998; Lopes, 2017; Monasterio, 2017). In particular, many names have very strong racial/ethnic links. A first name like Zhang (Chinese) or Ahmed (Muslim/Arab) is unlikely to belong to a person of predominantly European ancestry. However, to our knowledge, the average intelligence level of names and how these relate to social status differences between names has not been studied. These relations are central to understanding group differences in outcomes, which have been attributed to various causes such as discrimination, stereotyping, and socio-economic inequalities.

Indeed, a relatively large research literature in psychology and economics is concerned with the causal impact of names on e.g. job applications or housing discrimination (Carpusor & Loges, 2006; Christopher, 1998; Edelman, Luca & Svirsky, 2017; Fryer & Levitt, 2004). These studies generally do not consider the possibility that names might differ in average intelligence and that employers and others are rationally using these as Bayesian priors or base rates to evaluate risks and benefits of employing people (Jussim, 2012; Tetlock et al., 2000; for a contrary view, see Uhlmann, Brescoll & Machery, 2010). Published summary statistics for first names could be fruitfully used in future resumé studies as proxies for people's likely stereotypes.

Here, we examine data from first names of persons living in Denmark to see how the average intelligence of first names relates to social status and ethnicity. A key question from previous studies of immigrant social status in Denmark was the degree to which intelligence would mediate the social status gap between natives and foreigners (e.g. Kirkegaard & Fuerst, 2014). The present dataset allowed an estimation of this.

Data

Intelligence

Data from the Danish military draft intelligence test, Børge Priens Prøve (Teasdale, 2009), were obtained for a sample of 65,137 persons who took the test between 2009 and 2011. Most people who took the test were men who attended the military testing session shortly after turning 18 (mean age = 20), and a small number of volunteer women. We then computed average scores for each name that occurred at least 20 times in the dataset, which amounted to a total of 265 names (226 male) covering data from 65,137 persons. We used IQ norm data from a different study of 22k persons setting the Danish group of names to

$M = 100$, $SD = 15$ (Institut for Militærpsykologi, 2013; see Kirkegaard, 2013 for an English language explanation).

Social status

We used previously published name data ($n = 1,903$) for age adjusted social status in Denmark (Kirkegaard & Tranberg, 2015). The data originate from the Danish statistics agency (Danmarks Statistik, DST) who sold data about indicators of social status by first name to the magazine *Ugebladet A4* ('The Weekly A4'). The values are derived from whole population statistics covering every person legally residing in Denmark (~5.6 million). The magazine published the name data as part of an interactive tool on their website (<http://www.ugebreveta4.dk/navnehjulet>) which allows anyone to see the summary statistics for each name entered into a field. The data cover income, unemployment, criminality, marital status, typical professions, and home ownership among other things. The complete dataset from the website was obtained with an automated downloading tool. Social status was conceptualized as a general factor akin to general intelligence (Howe et al., 2012; Kirkegaard, 2014; Kirkegaard & Fuerst, 2017; Vyas & Kumaranayake, 2006) and extracted using factor analysis from the five available numerical indicators (the non-numerical indicators were not used as they were not amenable to factor analysis). These were first adjusted for age using a polynomial regression model. The factor score was then standardized to a mean of 0 and standard deviation of 1 for the entire sample of names.

Name origin

Origin status was manually coded for each name by researcher judgment. When in doubt, we consulted online name websites such as <http://behindthename.com/>. There were only 10 nonwestern names that occurred more than 20 times, so we opted for a simple binary variable for modeling purposes. All the nonwestern names were Muslim/Arabic: Ahmet, Mohamad, Mehmet, Ahmed, Mohammed, Mustafa, Ahmad, Mohamed, Mohammad, and Ali.

Analyses

Analyses were done in R 3.5.1. An R notebook can be found in the supplementary materials at <https://osf.io/yd9u8/>.

The average IQs for western and nonwestern names were 98 and 81, weighted by the population sizes of the names (98 and 82 unweighted, respectively). Figure 1 shows the weighted correlation between intelligence and general social status. Weighting was by square root of sample size, a reasonable

compromise between n-weighted and unweighted analysis, see discussion in Fuerst and Kirkegaard (2016).

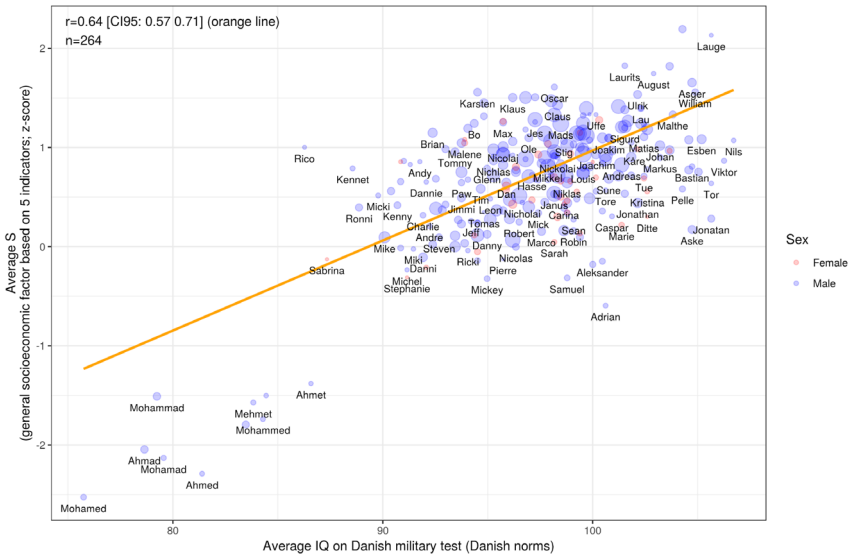


Figure 1. Scatterplot of intelligence and general social status for 264 first names of people residing in Denmark. Point size shows the relative sample size.

The unweighted correlation was similar, $r = .67$ (scatterplot in the supplementary materials). If the Muslim names in the bottom left are excluded, the correlation is decreased to $r = .42$ (unweighted $r = .39$). Among the non-western names ($n = 10$), the correlation was $r = .69$ (unweighted $r = .76$).

It is obvious from the plot that the nonwestern names fall substantially below the regression line, indicating an omitted variable. We carried out a formal mediation analysis using the **mediation** package for R (Tingley et al., 2014). This showed that 30% [95% bootstrapped CI: 20%-40%] of the social status difference between the western and nonwestern groups was mediated by the observed IQ difference. Similarly, a simple regression showed that taking IQ into account, the nonwestern names had a beta of -1.73, i.e. they fared much worse than their measured intelligence level would predict.

Discussion and conclusion

Using summary statistics derived from large datasets of first names in Denmark, we found that these show large variation in average intelligence level. This variation in average IQ was strongly related to variation in average social

status, with a correlation of $r = .63$ (weighted). Nonwestern names fared poorly both in terms of average intelligence level (mean = 81) and in social status (mean = -1.85). Mediation analysis showed that the low social status could be about 30% explained by the observed IQ scores. This study thus confirms the finding of lower cognitive ability among immigrants in Denmark previously reported (Bleses & Jensen, 2016; Kirkegaard, 2013; Rindermann & Thompson, 2016; Robie et al., 2017).

The relatively low level of mediation was somewhat surprising considering that Denmark is generally considered a fairly just and meritocratic country (Charron, Dahlström & Lapuente, 2016). There are many potential causes for why we observed the relatively low level of mediation. The most important cause is probably the acclimatization delay. When a person settles in another country it takes several decades to reach one's full potential. One reason is that the vast majority of immigrants lack Danish skills and do not understand the local culture. Since many immigrants have been in Denmark for only a couple of years, a delay in attainment is to be expected. In particular when moving from less industrialized societies, it is conceivable that one's intellectual capacity is estimated in accordance with features of the country of origin. In cases where the immigrant's intelligence is on a par with the host country, it will take some time for the immigrant to prove himself, and hence achieve social status congruent with his level of intelligence. The Danish statistical agency conducted their own analysis using individual level data which showed that the unemployment gap to native Danes was markedly lower for people who had been in Denmark for more than 15 years than for those who had arrived in the last two years (Bjerre, Mortensen & Drescher, 2016). This adjustment, however, confounds within country of origin differences. It is possible, for example, that people who left Iraq more than 15 years ago are differently selected on employment related traits than those who left less than five years ago. One would have to use repeated measurement data to assess this confound.

Second, it is possible that the Danish IQ test underestimates the intelligence level of non-westerners. As the test is given in Danish, people with poor Danish language skills might suffer a penalty.¹ However, those who actually took the test in the present study are expected to be native speakers of Danish, because military duty is reserved to people who are Danish citizens when they turn 18. Only very few first-generation immigrants would fit in this category, and those

¹ For discussion of the immigrant-native cognitive test score gaps in the Netherlands and the moderating effect of Dutch language ability, see Helms-Lorenz, van de Vijver and Poortinga, 2003; te Nijenhuis and van der Flier, 2001, 2003; te Nijenhuis et al., 2004.

would also have had to come to Denmark at a very early age. There is one single empirical study of test bias for this test ($n = 21,167$ Westerners, $n = 1,474$ non-westerners). It used a relatively simple design of comparing the subtest scores. The test has 4 subtests, of which 2 are verbally loaded; verbal: vocabulary and letter matrices; non-verbal: figures and number series (Teasdale, 2009). However, the Danish-nonwestern gap size was about the same for each subtest, consistent with approximately zero language bias (Institut for Militærpsykologi, 2013).

Third, Islamic beliefs and Arab/Middle Eastern culture probably have a negative causal effect on social status attainment that is partially independent of intelligence. This could be due to a preference for small business in order to be self-sufficient (i.e. autarky) and consequently avoidance of other industries. In an economic perspective, this would lead to a misallocation of skills and thus to lower wages. Anti-integration attitudes which are common among Muslims probably cause them to avoid contributing to Danish society as much as their intelligence level would allow them to do (Koopmans, 2015). A detailed review of economic studies of Islam and Muslims can be found in Kuran (2018).

Fourth, another possibility is that Danish society is biased against non-western people such that these are unable to attain the status level that is congruent with their intelligence level. Such causes are thought to exist for instance in the legal system, where immigrants might receive harsher penalties for 'the same' crimes, controlling for all measured confounders (Sweden: Kihlberg & Myrin, 2016; Shannon & Törnqvist, 2008). However, in general, Scandinavian societies are very welcoming to foreigners, with hundreds of millions of US dollars spent every year on various integration programs which have been running for more than four decades (Andersson & Jespersen, 2018; Sanandaji, 2017). Hence, if anything, the net effect of Danish biases can be expected to be small and perhaps even positive, and cannot thus explain the observed *negative* residual. More generally speaking, it is difficult to find any substantial associations between immigration policies and integration outcomes (Ersanilli & Koopmans, 2011).

Generally speaking, despite the dire situation of the European mass immigration project (Andersson & Jespersen, 2018; D. Murray, 2017; Sanandaji, 2017; Sarrazin, 2012), there is a remarkable lack of detailed studies that examine the most likely explanations for why most immigrants do not perform as well in host nations as in their origin nations (for a partial exception, see Koopmans, 2016). The reasons will involve some model that includes differences in intelligence, language, culture and religion. There is a strong need for large-scale individual-level datasets that allow direct testing of competing models.

Regarding variation in social status and first names in the native Danish population, there does not appear to exist much systematic research. It is hoped that the publication of this article will create some further interest in the topic.

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All study materials can be found at <https://osf.io/yd9u8/>.

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