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Research paper

Wastage of talent? Social origins, cognitive ability and educational attainment in Britain

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ABSTRACT

The extent to which societies suffer 'wastage of talent' due to social inequalities in educational attainment is a longstanding issue. The present paper contributes to the relevant literature by examining how social origins and early-life cognitive ability are associated with educational success across three British birth cohorts. We address questions of over-time change, bringing current evidence up-to-date. Our findings reinforce the well-established trend that the importance of cognitive ability declined for cohorts born between 1958 and 1970, but we show that for a cohort born in the early 1990s this trend has reversed. We further show that the relative importance of family background has not seen a corresponding decline. In distinguishing between different components of social origins, we show that family economic resources have become somewhat less important for children's educational success, while socio-cultural and educational resources have become more important. Even high ability children are unable to transcend the effects of their social origins. The problem of 'wastage of talent' remains; young people from disadvantaged backgrounds are still lacking the opportunity to fully realise their potential within the British educational system.

1. Introduction and background

The extent to which societies suffer a 'wastage of talent' as a result of social inequalities in educational attainment is a longstanding issue. In Britain as long ago as the 1930s, Gray and Moshinsky commented on the 'striking discrepancy' that exists between 'the amount of good material in the community and the extent to which the existing machinery of social selection utilizes it' (Gray and Moshinsky, 1935: 115). It has been argued that individuals' accomplishments should reflect their abilities and competencies, and the social and economic conditions of their families of origin should have little bearing on their later life outcomes. This argument can be upheld both from the standpoint of efficiency, in that the most able individuals should be matched to the most demanding social positions, and from the standpoint of social justice, in that a basic equality of opportunity should prevail. Existing research could be taken to indicate that even in advanced Western societies this ideal is far from being realised. Marked social inequalities in educational attainment still show up, and over the recent past would appear to have been reduced only to a quite limited extent; and in some cases – such as Britain – scarcely at all (e.g. Breen, Luijkx, Müller, & Pollak, 2009; Bukodi & Goldthorpe, 2013). It may, however, be argued that, contrary to appearances, these inequalities are not in fact ones primarily grounded in individuals' more or less advantaged social origins but rather in differences in cognitive ability, which is in large part genetically determined and thus intergenerationally transmitted (see, e.g., Saunders, 1996; Neilsen & Roos, 2012; Lucchini, Della Bella, & Pisati, 2013). And from this point of view, it may further be maintained that in modern societies no serious wastage of talent occurs (e.g. Marks, 2014).

We wish to make our position clear in two respects.

First, although in this paper we focus on individuals' cognitive ability, we by no means claim that cognitive ability is the only form of 'talent' individuals may possess. We acknowledge that talent is a multidimensional concept, with cognitive ability as one, albeit very important, dimension (cf. Lohman, 2009).

Second, we do *not* seek to address in any direct way the much-debated issue of the relative importance of genetic and environmental factors in the formation of cognitive ability. In this regard, we need to say only the following: the assumption that variation in cognitive ability within a population can be simply divided up into one part that is due to environmental effects and another part that is due to genetic effects no longer appears tenable. In the case of cognitive ability, as with many other phenotypical traits, it is becoming increasingly evident not only that many different genetic variants and complex gene–gene interactions are involved but, further, yet more complex processes of gene-environment interactions are occurring from very early life

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onwards (Jablonka & Lamb, 2006; Carey, 2012; Chabris et al., 2012; Jerrim, Vignoles., Lingham, & Friend, 2013). On these grounds, we would then question whether claims that variation in cognitive ability is 'primarily' genetically determined are at all meaningful. And we would note that clear evidence does exist of, for example, the effects of different aspects of the parenting of young children on the development of their cognitive ability (Byford, Kuh, & Richards, 2011).

In this paper our strategy is to begin by accepting the fact that if cognitive ability is measured, by standard tests, at a relatively early stage in children's lives, it is strongly associated with their subsequent educational attainment, regardless of their social origins (see e.g. Strenze, 2007; Deary et al., 2007). Taking cognitive ability as in this sense a *'given'* − i.e. leaving aside, for the purpose of our analyses, the matter of its determination − our concerns then focus on the *extent* to which individuals' cognitive ability and their social origins are associated with their educational attainment *when considered independently of each other*; and whether differences in this regard arise at different stages of individuals' educational careers and over historical time.

British studies have demonstrated that the role of cognitive ability in affecting individuals' educational attainment, net of the influence of their social origins, declined across cohorts born between 1946 and 1958 (Richards, Power, & Sacker, 2009) and between 1958 and 1970 (Galindo-Rueda & Vignoles, 2005; Schoon, 2010; Bukodi, Erikson, & Goldthorpe, 2014), but have not yet sought to determine whether this trend has continued for those born more recently. Moreover, evidence from other countries tells a contrasting story. Studies in the US, for example, identified a long period of stability for cohorts born between the 1920s and 1960s (Jencks et al., 1979), followed by a strengthening correlation for cohorts born since the 1970s (Jensen, 1998; Marks, 2014). The first question that we wish to take up is then the following. Is the association between individuals' early-life cognitive ability and their subsequent educational attainment, net of the effects of social origins, tending to weaken across cohorts, as past research using the British birth cohort studies would suggest, or tending to strengthen across cohorts, as appears to be the case in the US?

In regard to the role of social origins in individuals' educational attainment, net of their cognitive ability, the existing literature is also inconclusive. Past research in Britain reports substantial effects of family background (e.g. Galindo-Rueda & Vignoles, 2005; Mood, Jonsson, & Bihagen, 2012) that are only moderately reduced by cognitive ability and are largely persistent over time (Bukodi et al., 2014). But conflicting evidence exists from the US and other parts of Europe. Marks (2014), providing a synthesis of findings from the literature in this area across nations, claims that differences in academic performance between the most and least advantaged students have declined, asserting on this basis that what we have witnessed is a 'decline of the social'.

However, in much past research into inequalities in educational attainment in relation to individuals' family backgrounds the implicit assumption has been made that different features of social origins can serve as 'interchangeable indicators'; i.e. it matters little which is taken as the basis of analyses since the results obtained will be essentially the same. We believe that this assumption is an untenable one, and will lead to the importance of social origins being underestimated. As we have demonstrated in previous research (Bukodi & Goldthorpe, 2013; Bukodi et al., 2014), while different features of individuals' social origins are certainly correlated, the correlations are far from perfect, and it is therefore necessary to take a multidimensional approach and to consider how far different features of social origins − most importantly, parental class, parental status and parental education − have *independent* effects on individuals' educational attainment. Against this background, our second research question is the following. Given individuals' cognitive ability, as measured relatively early in life, to what extent do social origins, when taken to comprise the three different components, still have separate and independent effects on individuals' educational attainment, and are there changes in these effects across cohorts? Or, in other words, if we take individuals whose early-life cognitive ability is at a similar level, how far do social origins create disparities in their later educational attainment? If it is the case that individuals from less advantaged origins fare less well educationally than do their counterparts from more advantaged origins when cognitive ability is held constant, this would point to a failure of the educational system in terms of ensuring that the academic potential of all individuals is fully realised − i.e. to a wastage of talent. And insofar as any such wastage appears to exist, the question of whether or not any reduction in it is apparent across time is one of obvious relevance in evaluating the capacity of educational policy and reforms to increase equality of opportunity in the context of persisting inequalities of condition.

Although the focus of this paper is on the role of cognitive ability in educational inequalities, we believe that our findings have wider implications, extending across individuals' life-course. Existing literature suggests that early-life cognitive ability has effects, far beyond individuals' educational attainment, on a broad range of later-life outcomes, including occupational attainment (Cukic et al., 2017; Deary et al., 2005; Gale et al., 2009; Johnson et al., 2010; Sorjonen et al., 2015), health (Der et al., 2009; von Stumm et al., 2010), and marital status (von Stumm et al., 2011). Our research also speaks to the hypothesis of cumulative (dis)advantages that is based on the simple idea that small initial differences among individuals can be magnified over time, and this makes it difficult for individuals who are behind at an early stage in their educational careers to catch up. For example, it is possible that a highly able individual from disadvantaged background fails to achieve a good level of initial education, and this then puts her on a disadvantaged pathway, involving protracted labour market entry, slow career progression and low level of occupational attainment. Or, conversely, a less able individual with advantaged origin may leave full-time education with a relatively high level of qualification that facilitates a smooth labour market entry into an advantaged occupational position that itself provides good opportunities for subsequent career advancement. In other words, a favourable relative initial position becomes a resource that produces further relative gains; or put it yet another way: 'advantages beget advantages' (DiPrete & Eirich, 2006; Merton, 1968; Rigney, 2010).

2. Data and variables

We construct highly comparable measures using data from three longitudinal birth cohort studies to enable us to examine over-time trends. The National Child Development Study (NCDS) and the British Cohort Study (BCS70) each follow through their life-course more than 17,000 children born in Britain in one week in 1958 and 1970 respectively (see Elliott & Shepherd, 2006;Power and Elliott, 2006 Power & Elliott, 2006). The Avon Longitudinal Study of Parents and Children (ALSPAC) follows a sample of children born to over 14,000 pregnant women in the former region of Avon with an expected delivery date between April 1991 and December 1992 (see Boyd, Goulding, & Macleod, 2012).[1,2]

Appendix A in the online Supplementary material provides detailed descriptions of the efforts we have made to harmonise our key measures. We have ensured that, across the surveys, all of our measures of social origins are operationalised according to the same conceptual basis, and all measures of cognitive ability are consistent. We provide descriptive statistics to show that the distributions of our key explanatory and dependent variables change over time in the ways we would expect, based on past research (e.g. for parental class we see an

[1] The study website contains details of all data available through a fully searchable data dictionary (http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary/).

[2] Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics committees.