Research in Social Stratification and Mobility 42 (2015) 123–135

www.sciencedirect.com

Research in Social Stratification and Mobility

journal homepage: http://www.elsevier.com/locate/rssm

The openness of Britain during industrialisation. Determinants of career success of British men born between 1780 and 1880

Cristóbal Montt[a,*], Ineke Maas[a,b]

[a] Utrecht University, Padualaan 14, 3584 CH Utrecht, The Netherlands
[b] VU University Amsterdam, De Boelelaan 1081, 1081 HV Amsterdam, The Netherlands

ARTICLE INFO

Article history:
Received 18 September 2014
Received in revised form 3 September 2015
Accepted 6 September 2015
Available online 8 September 2015

Keywords:
Occupational career
Multilevel growth model
Industrialisation

ABSTRACT

In this article, we study the occupational careers of British men during industrialisation. We ask whether careers became more successful during industrialisation and whether British society became more open. Using the Longitudinal Study of Residential Histories dataset we analysed the career of 6229 men born between 1780 and 1880 with a multilevel growth model. Over time men's careers became somewhat more successful: men started their careers at a higher occupational status, but status did not grow at a faster rate. Father's occupational status and son's education were main determinants of career success. The importance of education did not increase, but the relevance of father's status declined, suggesting that with industrialisation Britain became a more open society.

'*What does the phrase 'the Industrial Revolution broke out' mean? It means that some time in the 1780s and for the first time in human history, the shackles were taken off the productive power of human societies, which henceforth became capable of the constant, rapid and up to the present limitless multiplication of men, goods and services. . .By any reckoning this was probably the most important event in world history, at any rate since the invention of agriculture and cities. And it was initiated by Britain.*'

Eric Hobsbawm, 'The Age of Revolution' (1962).

1. Introduction

Few processes in social history are said to have had such a profound effect on society as the industrial revolution. Before this rapid process of industrialisation, a large proportion of manufacturing of products was done at home on a small scale and parallel with agricultural tasks. A great deal of this production was for the consumption of the household itself. Industrialisation meant the increasing replacement of human labour through the use of mechanical devices (e.g. the spinning jenny) and the use of new forms of energy, such as the steam engine (Davis, 1955). This had a profound effect on the British textile industry—the most important industry at the time—which dramatically increased its output: from 40 million yards of cloth in 1785 to 2025 million in 1850 (Hobsbawm, 1962). By increasing productivity, these technological innovations led to a steep decline in prices of textiles and other non-agricultural products, which encouraged individuals to replace their domestic production with the purchase of industrial products. The productivity of the agricultural sector also rose. This allowed the release of labour, which boosted the proportion of workers available for commercial manufacturing (Weisdorf, 2006). Indeed, data on long-term changes in the occupational structure of Britain show a definitive shift to manufacturing during the nineteenth century as the agriculture sector shrank from 35.9% of the total occupied population in 1801 to 8.7% by 1901 (Joyce, 1990).

Theorists of industrialism have stated that the changes in the occupational structure triggered by industrialisation had an important effect on the patterns of social mobility experienced by individuals (Kerr, Dunlop, Harbison, & Myers, 1960; Treiman, 1970). It has been argued that industrialisation increased the amount of social mobility, as well as the average occupational status of the population. People were expected to enjoy more successful careers, a higher level of status and income, and increased upward mobility. Furthermore, it is said that industrialisation made society more open in the sense that the importance of ascriptive factors (i.e. social background) on career success receded and left space for achieved characteristics of individuals, such as their educational attainment and effort (Blau & Duncan, 1967).

Despite the far-reaching impact of industrialisation there is not a great deal of empirical knowledge about how it affected occupational careers. For the 'pre-sample survey' period, career research has predominantly depended on the personnel records of companies, firms and government departments (Van Leeuwen & Maas, 2010). As a consequence much of the research has focused on

* Corresponding author at: Camino de las vertientes, 1486 Santiago, Chile.
E-mail addresses: c.s.montt@gmail.com (C. Montt), i.maas@uu.nl (I. Maas).

http://dx.doi.org/10.1016/j.rssm.2015.09.003
0276-5624/

the study of specific occupations within a certain economic sector or organisation. For example, Shpayer-Makov (2004) focused on the work-life history of policemen in Victorian and Edwardian England, Mitch (2004) investigated the careers of agricultural workers in a small region of Britain, while Miles and Savage (2004) looked at career patterns within three large British organisations. This restriction to specific occupational groups or few organisations does not permit generalisation of the findings to the working population (Schulz & Maas, 2012).

In recent times the digitalisation of censuses and population registers has increased the amount of historiographical data available for analysis. Accordingly, some research has been done on larger samples. For example, Maas and van Leeuwen (2004) combined historical sources to describe changes in the occupational careers of a large sample of Swedish men. For the case of Britain, Long (2005) linked 28,474 men from the 1851 Census of the Population of England and Wales to the 1881 census to study the effects of rural to urban migration on social mobility. Long (2006) linked the data of 5337 school-aged men from the aforementioned censuses to study the importance of their primary schooling for their subsequent labour market outcomes. Mitch (2005) also used the census records of 1851 and 1881, which he matched to a sample drawn from marriage registers to study occupational mobility. He was particularly interested in comparing the role of literacy for upward mobility between the rural region of Norfolk and the urban region of Birmingham. Finally, Prandy and Bottero (2000) used longitudinal genealogical data of men born between 1790 and 1909. However, they did not investigate complete occupational careers, but summarised the occupational information into occupational status at a few points in time in order to estimate a path model. Unlike Long (2005, 2006), Mitch (2005) and Prandy and Bottero (2000), who only examined the difference in status within individuals' careers at a few points in time, Schulz and Maas (2012) used longitudinal data on occupational careers from the Netherlands to study the determinants of career success for men and women between 1865 and 1940. We will follow their approach and use longitudinal data to study the careers of the male labour force in Britain during industrialisation for those born between 1780 and 1880. We pose the following research questions:

- Did men have more successful careers in Britain as the country became industrialised?
- Did British society became more open during industrialisation?

We will use data from the Longitudinal Study of Residential Histories (Pooley & Turnbull, 1996). This dataset consists of a large sample of high-quality longitudinal data on individual residential histories from the eighteenth century to the twentieth century in Britain. Although the main purpose behind the data collection was to gather information on the history of individuals' residential moves, the occupational status of individuals was recorded before and after each residential move, resulting in between 1 and 67 occupations per person, and 41,205 occupational measurements for 6229 men born in Britain between 1780 and 1880 who were in the labour market between 1790 and 1950.[1] This dataset provides the opportunity to study the development of the careers of the British male labour force over a century of profound changes.

The data will be analysed with a multilevel growth modelling method. We excluded women from the analysis as this technique assumes that women for whom there is no occupational measurement behave in the same way as those women with similar characteristics who remain in the labour market. This is a problem since women who did not leave the labour market during this historical period are expected to have been a very selective group.[2] We define a successful career as having on average, over the life-course, a high occupational status. In our first set of models this average status will be the outcome. A high average status can, however, come about in two ways. Men either start their career in a high status occupation and remain there, or they start at a lower level, but experience upward mobility. Following Schulz and Maas (2010), in our second set of models we therefore differentiate two aspects of a career. The first relates to the level of occupational status at which the career starts, while the second refers to how fast occupational status grows over the course of a man's work-life history. Both aspects do not necessarily go hand in hand, since the higher the status of the first occupation, the more difficult it is to gain additional status, as studies on career mobility have shown (e.g. Blossfeld, 1986). We will derive hypotheses on both the starting level of the career and on growth in occupational status.

With this research we would like to contribute to previous research in three ways. First, we will study consequences of industrialisation on men's occupational careers in Britain, the country that first experienced industrialisation. To our knowledge—this would be the first attempt to study the career trajectories of the male labour force during industrialisation in Britain over such a long historical period and across different occupations, social backgrounds and geographical regions.

Second, we aim to contribute to the scarce literature on occupational careers of men in the past by evaluating whether the conclusions of Schulz and Maas (2012) and Schulz (2013), regarding the changes in occupational careers during industrialisation in the Netherlands, can be extended to another country during industrialisation, namely Britain. Their main findings were: (1) occupational careers peaked early in men's life (before age 40), (2) both father's occupational status and son's literacy were strong predictors of son's average occupational over his career, but only son's literacy caused a faster growth of status during his career, and (3) the effect of father's occupational status decreased during industrialisation, but the effect of literacy did not (yet) change.

And third, our dataset is one of the very few pre-survey datasets that contain information on educational attainment. Previous studies (e.g. Mitch, 2005; Schulz & Maas, 2012; Schulz, 2013, but see Long, 2006 for an exception) usually used literacy (whether someone signed his or her marriage act), which is a rather restricted indicator of educational attainment. Since literacy measured in this way was almost universal at the end of the 19th century it was bound to lose predictive power, whereas more extended education may have become more important. By using a more elaborate measure of educational attainment we can perform a better test of the claim that industrialisation made societies more open.

2. Theory

2.1. An individual model of career success

Over the course of their occupational career, workers increase their productivity by learning new skills and perfecting old ones (Becker, 1962). Therefore, the longer a worker has been in the labour force, the more skills he has developed, making him more

[1] These numbers of individuals and occupational measurements correspond to the final dataset after making the selections discussed in the data section.

[2] Schulz and Maas (2012) showed for the Netherlands that women who continued working after marriage were predominantly of higher status. This selection led to the estimation of a significant positive effect of marriage on the occupational status of women, contradicting theory. This finding led them to conclude that growth models are more suitable for the study of the careers of men than of women.

productive and increasing his chances to reach a high status. Work experience also signals to the employer that the employee actually knows how to perform his job and, thus, that lower training costs are needed in comparison to a worker with less experience, making the decision of hiring a potential employee less uncertain in respect to future job performance (Spence, 1973).

The effect of work experience on career growth is expected to decrease with time in the labour force. According to Sørensen's (1977) vacancy competition model this is the case because the distribution of jobs has a pyramidal shape, hence the higher one's current occupational status, the fewer higher jobs remain. Human capital theory makes the same prediction, but through another mechanism. The longer an employee has been in the labour force, the less likely it is that he will invest in his own human capital because of the smaller number of years that he can profit from his higher productivity. Hence, the less likely it is that he will obtain a higher occupational status compared with younger employees (Allmendinger, 1989; Blossfeld, 1986; Maas, 2004). We expect that occupational status increases with work experience, but to a lesser extent as the individual gains more work experience (see Table 1 for an overview of the hypotheses).

Human capital theory postulates that the higher the productivity of an individual, the more an employer is willing to reward him economically (Becker, 1962; Polachek, 2008). One way of increasing one's productivity is by investing in education. Thus, the higher the level of educational attainment, the greater the chance someone has of being successful in the labour force. Returns on education increase with years in the labour force because better educated individuals increase their productivity faster and are also expected by employers to be easier to train (Schulz & Maas, 2012). Consequently, we expect men with a higher educational level to start their careers at a higher occupational status and to have a higher rate of growth in occupational status than those with a lower educational level.

However, signalling and job screening theories (Arrow, 1973) differ from human capital theory with respect to the expected change in impact of educational achievement during the life course of an individual. These theories state that the effects of education are more pronounced at the beginning of a worker's career. When employers have access to first-hand information about an individual's actual productivity, their credentials lose relevance, leaving room for actual performance to determine how an individual's career progresses (Barone & Schizzerotto, 2011).

Investing in one's career can also be done by migrating to a region with better economic prospects. The human capital model of migration (Long, 2005; Sjaastad, 1962) postulates that workers anticipate that geographical differences in the degree of industrialisation affect their individual opportunities of career success. People are only likely to migrate when the expected economic benefits of the place of destination are higher than at the current place of residence. Of course, people may also move for non-economic reasons, for example, family obligations. This type of migrants is called 'tied movers' in the literature (Chiswick, 1999). This migration of 'tied movers' probably affects the career success of migrants in a negative way, as individuals may resign good career prospects. Tied movers are, however, mostly women and children.

Smits (2001) refers to several studies that found that immediately after migration the economic situation of migrants was worse than before migrating. Only in the long run, the returns of migration became positive. There are two plausible explanations for this. The first comes from human capital theory, which states that individuals may accept lower status jobs immediately after a move if they expect that migrating offers better long-term prospects (Smits, 2001). Furthermore, according to human capital theory migrants are a favourable self-selected group, that is, more able and more highly motivated than non-migrants, and thus more successful in the long run. According to the second explanation one consequence of migration is the loss of an individual's social capital. As migrants can no longer benefit from the resources embedded in their former social network, such as job-relevant information or direct help in obtaining a job (Lin, 1999), they become disadvantaged in comparison to their situation prior to migration with respect to obtaining higher occupational status jobs. In the long run, this disadvantage recedes as migrants invest in social capital in their place of destination. We therefore expect that after migrating for economic reasons, men have a lower occupational status than before migration, but they have a higher growth rate.

2.2. Social capital and societal norms

The family of origin is the most important source of social capital of people, especially early in their life. Fathers owning their own farm, shop or workplace are likely to transfer these means of production to their son. Higher status fathers may teach their sons occupation specific knowledge that helps them to obtain a high status themselves. And—depending on their level of authority—fathers may directly help their children to get better jobs by using this authority. It is also argued that children of higher status families have an advantage over lower status children due to the fact that they incorporated the cultural resources specific to their class, such as attitudes, language skills and styles of interaction which can be used by an employer to identify the social class of an applicant, enabling them to select someone from their own social background (Bourdieu & Passeron, 1994; Collins, 1971).

The possibilities of fathers to influence the career progression of their children are not limited to assuring a better starting position in the labour market. A son may inherit a family business after some initial shifts between jobs, or during his career make use of the social capital provided by his parents, or receive work-related advice (Barone & Schizzerotto, 2011; Schulz & Maas, 2012). Therefore we expect that men whose fathers have a higher occupational status start their careers at a higher occupational status and have a higher rate of growth in occupational status compared to men with fathers of lower occupational status.

According to social capital theory, resources of the spouse and her network (e.g. the resources of her parents), positively affect the career of her partner. They can be used instrumentally to obtain a higher occupational status in much the same way as parental resources (Robert & Bukodi, 2002). The spouse's father may be especially motivated to help his son-in-law obtain a higher status position as a way to ensure a higher status for his daughter. Marriage can also have a positive effect on the career of men because of social expectations. Because men are expected to be the breadwinner of the family (Pfau-Effinger, 2004) married men feel a stronger financial responsibility, which makes them invest more in their work, and even more so if they have children. This investment is rewarded by employers with higher pay or promotions. Furthermore, employers might discriminate in favour of married men because they believe they will be more productive than non-married men (Kalmijn & Luijkx, 2005; Korenman & Neumark, 1992) or because they believe that men with a family deserve better chances than those without, making married men less likely to be fired (Schulz & Maas, 2012). Marriage may have been especially relevant in the case of Britain in the period under study. During the nineteenth century a large proportion of single men lived and worked in the same place apprenticed to a master, or as a farm worker or domestic servant. In this context, the event of marriage pushed them to seek another job in order to attain greater independence, a higher disposable income and an independent home (Pooley & Turnbull, 1997). For these reasons, we expect the occupational status of married men and their growth rate to be higher than that of non-married men.

Table 1
Overview of hypotheses.

Work experience	1.	Occupational status increases with work experience, but to a lesser extent as the individual gains more work experience.
Educational level	2a.	Men with a higher educational level start their careers at a higher occupational status compared to those with a lower educational level.
	2b.	Men with a higher educational level have a higher rate of growth in occupational status than those with a lower educational level.
	2c.	The positive effect of education on the growth rate of occupational status decreases with work experience.
Migration	3a.	After migrating for economic reasons, men have a lower occupational status than before migration.
	3b.	After migrating for economic reasons, men have a higher growth rate in occupational status than before migration.
Father's occupational status	4a.	Men whose fathers have a higher occupational status start their careers at a higher occupational status compared to men with fathers of lower occupational status.
	4b.	Men whose fathers have a higher occupational status have a higher rate of growth in occupational status compared to men with fathers of lower occupational status.
Marriage	5a.	Men have a higher occupational status after marriage than before marriage.
	5b.	Men have a higher rate of growth in occupational status after marriage than before marriage.
Birth cohort	6a.	Later cohorts of men start their careers at a higher occupational status compared to earlier cohorts of men.
	6b.	Later cohorts of men have a higher rate of growth in occupational status compared to earlier cohorts of men.
Birth cohort * father's occupational status	7a.	The effect of father's occupational status on son's occupational status decreases with birth cohort.
	7c.	The total effect of father's occupational status on son's occupational status does not decrease over time.
Birth cohort * educational level	7b.	The effect of the level of education on the occupational status of men increases with birth cohort.
Birth cohort * marriage	7d.	The positive effect of marriage on men's occupational status after marriage increases with birth cohort.

2.3. *Effects of industrialisation*

The increasing mechanisation of the labour force produced by industrialisation nurtured the 'factory system' which demanded more technical manual labour in order to design and maintain the ever-increasingly complex machinery, as well as more non-manual labour—such as clerical and administrative workers—in order to be able to administer the progressively complicated productive system (Kuznets, 1957; Treiman, 1970). These demands resulted in the proliferation of new occupations and the disappearance of old ones. In Britain for example, over time the traditional cotton handloom weavers who worked from their homes were replaced by those working alongside the spinning and weaving mills in the factories (Hobsbawm, 1962). The new occupations that came about with industrialisation are expected to have increased an individual's opportunities of having a more successful career due to the upgrading of the occupational structure, since the new jobs had, on average, a higher occupational prestige than the old manual and agricultural ones (Allmendinger, 1989; Blossfeld, 1986).

Furthermore, as an industrialised economy became increasingly skill-based, organisations started to develop internal labour markets to secure firm-specific human capital (Osterman, 1984). In other words, with industrialisation came the development of what nowadays is understood as the modern career, that is, a more or less orderly structure of a sequence of jobs within or across organisations with prospects of upward mobility (Miles & Savage, 2004). For example, the Great Western Railway, which was founded in 1833, offered opportunities of promotion to its workers from its early beginnings (Kingsford, 2006). The same can be said of the British Post Office (Miles & Savage, 2004) and the British police (Shpayer-Makov, 2004). We therefore expect that later cohorts of men start their careers at a higher occupational status and have a higher rate of growth compared to earlier cohorts of men.

Modernisation theory states that before industrialisation the conditions of birth were more likely to determine the subsequent productive roles of individuals (Grusky, 1983). Economic and familial roles were closely integrated since the main unit of production was the household. With industrialisation came a shift towards a market economy. This process of rationalisation of the productive system, combined with the new occupations that came about with industrialisation, led to a decrease in the influence of parental resources on the career success of men. Due to the differentiation of the economy the family could no longer provide adequate skills for the new economic roles. Moreover, as the economic sector separated itself from the household, it freed itself from the particularistic and affective constraints of the domestic economy, thus the occupational sphere increasingly started recruiting employees on the basis of efficiency considerations rather than kinship ties (Grusky, 1983). Thus, the effect of father's occupational status on son's occupational status is expected to decrease with birth cohort.

With the displacement of the domestic system and the specialisation of labour, the function of transmission of skills was increasingly assumed by independent educational institutions (Grusky, 1983; Knigge, Maas, Van Leeuwen, & Mandemakers, 2014). As the new occupations that emerged during industrialisation demanded trained personnel, education became more relevant as more jobs required skills that fathers could no longer provide (Blau & Duncan, 1967; Treiman, 1970). We expect that the effect of the level of education on the occupational status of men increases with birth cohort.

If the direct effect of father's status on son's status decreases and son's education becomes a more important predictor of his status, it is unclear what happens with the total effect of father's on son's status. This depends on the relative size of these two effects and on the effect of father's status on son's education. Modernisation theory (Treiman, 1970) assumes that conditions of birth generally become less important and thus also educational inequality decreased and that the two decreasing effects outweigh the increasing importance of education. But others state that the direct transfer of status is simply replaced by an indirect transfer (Bourdieu & Passeron, 1994). During the period under study, education was not widespread in Britain. Only half of 6–14 year olds were in school in 1851 (Long, 2006). It was not until the Education Act of 1870 that Britain created its own national system of universal elementary education. Prior to that, school attendance in Britain was strictly voluntary and the likelihood of children attending school depended greatly on their social background. Sons of fathers with high-class occupations were more likely to attend school, and to attend until a later age than their lower class counterparts (Long, 2006). This was not due to prohibitive educational fees which the poor could not

pay, but to the potential cost of foregone wages obtained through child labour (Long, 2006).[3] It is very well possible that the effect of father's occupational status merely shifted from a direct effect to an indirect effect because educational inequality remained stable or even increased. We will therefore also test the hypothesis that the total effect of father's occupational status on son's occupational status did not decrease over time.

According to Pfau-Effinger (2004), in pre-modern societies the labour force of women was integrated into the household, but during industrialisation there was a widespread intent to exclude women from paid work, which coincided with the rise of the male breadwinner model. Due to the insufficient wages of men, children and women—especially those of lower status—had to work anyway but for lower economic returns as the wage earned by a husband ought to be sufficient to support his family (Horrell & Humphries, 1995; Seccombe, 1986). The exclusion of women, and their shift into less secure and underpaid jobs increased the importance of their husbands and fathers as 'breadwinners', strengthening the positive effect of marriage on men's occupational status after marriage.

3. Data, measures and method

3.1. Data

The Longitudinal Study of Residential Histories (LSRH hereafter), consists of a large sample of high-quality longitudinal data on individual residential histories from the eighteenth to the twentieth century in Britain (Pooley & Turnbull, 1996). The main purpose behind the data collection was to gather information on the history of individuals' residential moves in order to test migration theory against empirical evidence.

To obtain the data, the LSRH project asked family historians and genealogists to respond to calls for information published in the magazines of 63 family history and genealogy societies. Coverage included both national and regional societies, and spanned all parts of Britain, although there was no attempt to collect information from societies in Ireland. The advertisements gave brief details of the project and asked family historians who had information on the residential history of ancestors born between 1750 and 1930 to contact the researchers. All those who responded were sent a number of data entry forms. Between December 1993 and September 1995 a total of 1388 family historians and genealogists provided information on 15,334 men and women who had undertaken a total of 73,864 residential moves during their lifetimes (Pooley & Turnbull, 1996).

The data entry forms required a number of questions to be filled in for each residential move made by an individual. Since it was not only information on the residential history of ancestors that was required, but also details of all places of work, reasons for migration, and other significant life course events (i.e. marriage, childbirth, death of a spouse, etc.), family historians had to use very diverse sources (such as parish registers, census returns, wills, electoral rolls, house deeds and oral evidence). The motivation of family historians to collect all this information and their access to family documents, usually unavailable on a large scale to researchers, makes this dataset very rich. Most importantly, for each residential move the data entry forms required information on the individual's occupation before and after the move. Hence, for each residential move, information on two occupations is available.

It is important to note that this dataset has its biases. Since the amount of occupational information is dependent on the number of residential moves individuals made, it is obvious that individuals who never moved cannot be analysed. For the case of men, we can argue that the percentage of them who never moved must have been very low. If they did not move while living with their parents (e.g. due to the need to increase the size of the dwelling as the family became larger) they most likely did so when they were older, because in the period under study men usually left the family home early to take up a job or an apprenticeship (Pooley & Turnbull, 1997). Farmers were probably the least likely to move, but if we compare the percentages of men working in the agricultural sector according to Joyce (1990) with our data they are rather similar. Around 1801 these percentages are 35.9 according to Joyce versus 37.7 in our data and around 1901 8.7 versus 7.9 in our data (Table 2). More problematic is probably that not all occupations for each individual were recorded, but only those coinciding with a residential move. The implications of this will be considered in the conclusion.

Other possible biases of the data were assessed by Pooley and Turnbull (1996) comparing the information from available censuses with the LSRH dataset. Due to the fact that family historians tend to follow surnames down the male line the data over represent males. As we are interested in men this bias is actually an advantage. Also, as family historians are more interested in their ancestors who survived and produced a family line, there is little information on those who died young. Infant mortality in the first years of life was high in the 18th and 19th century, but does not affect our results. With respect to those who died as young adults, they probably would not have had occupational patterns which were significantly different from their siblings who survived (Pooley & Turnbull, 1996). This is because the death of young adults was more likely due to random events such as infectious diseases and less likely because of individual handicaps which would have made them less successful in their career. There is some bias towards those in higher socioeconomic groups since they were more likely to leave a historical record because of their affluence and literacy (Pooley & Turnbull, 1996). However, men from lower origins are in large numbers included in the data, allowing a comparison of their fate with that of men starting with better conditions. Regarding the geographical distribution of individuals in the LSRH dataset, this is quite close to the distribution of the population depicted in the British censuses.

The most important asset of the LSRH is that it is one of the few available historical datasets that allow the occupational history of individuals to be studied from a longitudinal perspective. In fact, most historical datasets contain only one or a few occupational measurements per individual. Historians have predominantly used the information accessible through marriage registers, where the occupation of the bride and groom are recorded. These records can be linked with the birth and death certificates of the grooms or with the marriage register of the groom's own children, as the occupation of the parents are also often recorded (Van Leeuwen & Maas, 2010). Nonetheless, even if this is done, there are no more than a couple of occupations recorded per person. Another approach to studying careers requires linking individuals between censuses, thus reconstructing part of their occupational history (Long, 2005). However, this process is not free from errors and often leads to large numbers of unlinked individuals (Van Leeuwen & Maas, 2010). In this context, the limitations of the LSRH dataset discussed above are compensated by its richness in information on occupational measurements for individuals over an extended period of time.

From the original data certain selections of respondents were made. First, women were excluded from the data for reasons already explained in the introduction. Additionally, because moves made further into the past were less likely to be recorded (Pooley & Turnbull, 1996), our analysis begins with men born in the year 1780,

[3] Long (2006) states that, according to the Newcastle Commission Report on Popular Education in 1861, the wages of children were much greater than school fees in the 1850s.

Table 2
Occupational distribution by period (%).

	Period					HISCAM
	1791–1820	1821–1850	1851–1880	1881–1910	>1910	
Agricultural labourer/farm servant	18.4	12.5	7.3	2.9	0.9	37.4
Skilled/semi-skilled agriculture	7.7	6.5	6.3	4.7	3.3	40.2
Domestic service	1.7	1.5	1.3	2.0	1.7	43.6
Unskilled (craft, industry)	3.3	5.2	6.0	5.5	3.6	45.3
Semi-skilled (craft, industry)	5.6	7.3	9.6	10.1	9.5	48.2
Landed farmer/yeoman	11.6	9.1	4.7	3.5	3.7	49.3
Skilled manual (craft, industry)	28.0	32.5	33.0	31.6	23.9	55.4
Army, navy, raf, land army	4.7	1.2	1.7	1.5	4.0	63.3
Skilled non manual	4.6	5.7	8.1	13.4	11.9	67.7
Intermediate/managerial/small business/shopkeeper	7.1	12.1	14.8	14.9	20.9	75.6
Professional/higher managerial/employer	7.4	6.3	7.1	9.7	16.5	89.6
Total	100.0	100.0	100.0	100.0	100.0	

Source: Longitudinal Study of Residential Histories.
Based on the 'occupation after residential move', only one occupation per year.

approximately at the start of the industrial revolution. Cohorts born after 1880 were also excluded from the data. Since family historians usually have a higher than average education, the less time between the observation of an ancestor and the birth of the family historian, the more biased the dataset. If the value of any independent variable was missing, that occupational measurement for that individual was deleted from the dataset (this pertains to 8868 occupational measurements, resulting in the deletion of 1190 men). Since occupation is measured both before and after a residential move, the analysed sample includes twice as many occupational measurements as moves. In total, the final dataset includes 41,205 occupations of 6229 men.

Fig. 1 presents the number of observations (occupational measurements) per five-year age group for men. Most measurements were made between age 21 and 30 (this was possibly because men were likely to move out of their house at this age due to marriage). The decrease in the number of occupational measurements begins at age 30. There are at least 2000 occupational measurements per age group up to the age of 55.

3.2. Measures

Occupational status: Pooley and his research team coded the occupational information in the data into 11 occupational classes: (1) professional/higher managerial/employer, (2) landed farmers, (3) intermediate managerial/small business/shopkeeper, (4) skilled non-manual, (5) skilled manual (craft industry), (6) skilled/semi-skilled agriculture, (7) semi-skilled (craft industry), (8) unskilled (craft industry), (9) agricultural labourer/farm servant, (10) domestic service, and (11) army, navy, RAF,[4] land army. This means that the capacity to distinguish between occupations of similar but still different occupational status is hindered by the limited number of occupational categories. To facilitate comparison with the studies of Schulz and Maas (2012) and Schulz (2013) we assigned a HISCAM status score to the 11 occupational categories (Lambert, Zijdeman, Van Leeuwen, Maas, & Prandy, 2013). HISCAM scores are connected to the 1600 occupational categories in the historical occupational classification system HISCO (Van Leeuwen, Maas, & Miles, 2004). We therefore first grouped the different HISCO categories into the occupational classes available in the LRSH data. Then, the average HISCAM score for each occupational class of the LRSH was calculated.[5] The resulting HISCAM scores range from 39.5 for 'domestic service' to 77.8 for 'professional/higher managerial/employer'.[6] Note however that although we are now using the same scale as previous studies, we still observe less mobility because our scale is based on 11 occupational classes instead of 1600 occupational categories. Our tests of the hypotheses are conservative (in favour of the null hypothesis) since we have to rely on observations of large changes in status and don't observe the much more frequent small changes.

Level of education: If men were studying when they made a residential move, the educational level which they were pursuing at that time was recorded. We selected the highest achieved level of education of each man. Five categories were constructed: unknown, no schooling, scholar, apprentice, and student. In the language of the Victorian censuses, "scholars" were children older than five who attended school on a daily basis, or received regular tuition under a master or governess at home (Long, 2005). Apprenticeships were the main options to prepare an individual for a position in skilled manufacturing, service, and mercantile occupations. Individuals typically began their apprenticeships between the ages of 14 and 17 under the tuition of a master with whom they resided while training (Long, 2006; Wallis, 2008). "Students" correspond to individuals that followed higher education at the university level. Men who moved between the ages of 6 and 18 and did not report any type of education between these ages or afterwards are considered as not having any type of educational qualification. Obviously, this is not a perfect measurement for determining 'no schooling'. It can be that children attended school, but not at the age that they migrated. The percentage of children without any schooling will therefore be overestimated. If individuals did not move between the ages of 6 and 18 and did not report any type of education at older ages, it is not possible to determine whether they had any degree of schooling or not, and therefore they are coded as having an unknown educational level. A dummy variable was created for each education type.

Work experience: Work experience was measured as the number of years from entry into the labour force. This is a good proxy, especially for men, as the lack of welfare support during the period of study left men without many other alternatives to secure their subsistence than to work. For men for whom data on the year they started working was missing, the average age at which the other men began working (15 years old) was used. Experience

[4] Royal Air Force.

[5] The HISCAM scale for Great Britain was used to calculate these averages (version 0.1, accessed February 2014 from http://www.camsis.stir.ac.uk/hiscam/)). There are newer versions of the HISCAM scale, but this one resulted in more variation between the different LRSH classes.

[6] The coding syntax on how the average HISCAM scores were calculated for the different classes in the Pooley scheme is available on request.

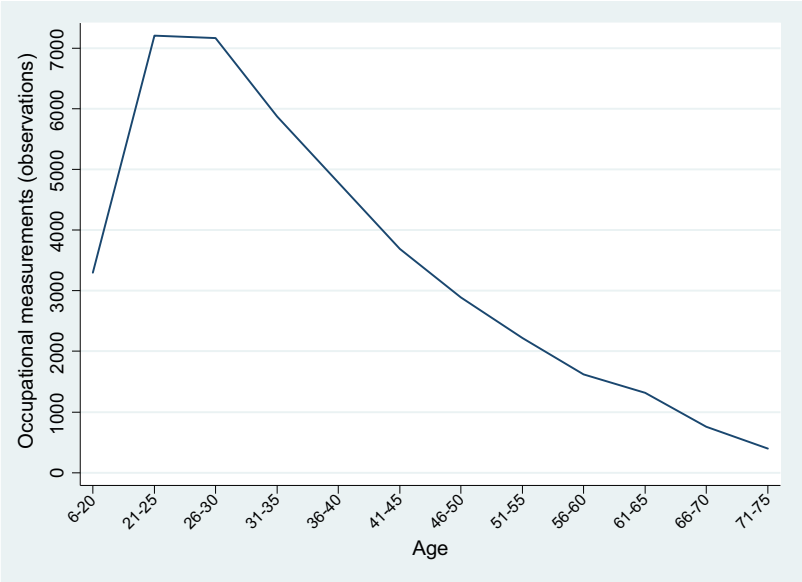

Fig. 1. Occupational measurements (observations) per 5-year age group 1780–1880
Source: Longitudinal Study of Residential Histories.

was divided by 10 (to avoid too small numbers in the table) and a quadratic term was added in order to be able to test the hypothesis that the effect of experience declined over the occupational career.

Father's occupational status: This variable is created in the same way as occupational status of the son. It corresponds to the time the respondent was born. Father's status was centred around its mean in the interaction between father's status and work experience and between father's status and birth cohort.

Marital status: At each residential move the marital status of individuals was recorded. From this, three dummy variables were created for marital status, namely: single, married, and lost partner. The numbers of cohabiters and divorcees were very low (<100). Therefore, cohabiters and married couples were grouped together as well as widowers and divorced people.

Migration: The data provide information on the reasons why men decided to migrate. Three dummy variables were created: 'move for economic reasons', 'move for non-economic reasons' (e.g. wartime evacuation, family crisis, house change, etc.), and 'unknown reason for moving'. The reference category is the observations before migration.

Birth cohort: This variable is measured in number of years since 1780 divided by 10. In the interaction with the predictors at the individual level, it was centred on 1830.

Urban: This control variable indicates whether the place where the individual worked was urban or rural. Following Long (2005), we consider urban areas to be places with more than 20,000 inhabitants. From this, a dummy variable was created which received a value of 1 if the place of work was urban or 0 if it was rural. The data for constructing this variable were obtained from the British Census of 1891.[7]

Children: This control variable indicates whether a man ever had children. It received a value of 1 from the birth of the first child onwards and 0 for all the measurements prior to this event.

Table 3
Descriptives of time invariant and time varying variables.

	Range	Mean/%	SD
Number of occupational measurements	1–67	6.6	6.3
Time invariant variables (*N* = 6229)			
Father's occupational status (HISCAM)	37.4–89.6	54.9	13.2
Education			
Unknown		47.7	
No schooling		23.8	
Scholar		15.8	
Apprentice		8.9	
Student		3.8	
Time varying variables (*N* = 41,205)			
Occupational status (HISCAM)	37.4–89.6	58.2	14.6
Work experience/10	0–9.8	2.1	1.3
Marital status			
Single		15.8	
Married		80.1	
Divorced/widowed		3.4	
Migration			
Before moving		34.7	
After moving for unknown reason		30.1	
After moving for non-economic reason		17.1	
After moving for economic reason		18.2	
Birth cohort (from 1780/10)	0–10	5.7	2.5
Children		70.6	
Urban		45.6	
Unemployed		0.1	

Source: Longitudinal Study of Residential Histories.

Unemployment: The control variable 'unemployment' was coded 1 if the individual was unemployed prior to the present occupational measurement and 0 if otherwise.

The descriptives of the dependent and independent variables are presented in Table 3.

3.3. Method

We follow the approach of Schulz and Maas (2010) to study occupational careers using historical data with a multilevel growth model (for other applications see Barone, Lucchini, & Schizzerotto, 2011; Manzoni, Härkönen, & Mayer, 2014). This enables us not only to model average occupational status over the career, but also to differentiate the level of occupational status at which the career

[7] Specifically, the data were obtained through the '1801 to 1891 Census Report of England and Wales: Parish and Registration District Population' from CAMPOP (Cambridge Group for the History of Population and Social Structure). Two different analyses were performed, one using the population in 1801 and another using the population in 1891 to see if this affected the results; there were no differences.

starts, and how fast occupational status grows. Differences between individuals in the shape of their career will be modelled using time-constant predictors (e.g. father's occupational status, education) and time-varying predictors (e.g. marital status, migration).

Five models will be estimated. Model 0 is the null model, which indicates how much variation in occupational status was between and within individuals. Model 1 includes all main effects of individual predictors on men's occupational status. In model 2, the separate effects of individual characteristics on occupational status at the start of the career and the rate at which the occupational status of men grew over their life course are assessed (the latter by an interaction of these variables and work experience). And in model 3 we investigate interactions between individual characteristics and time. Finally, the last model includes all the main effects of individual predictors plus interactions over the life course and over time.

We perform sensitivity analyses to investigate to what extent our results are affected by scoring the eleven occupational categories on the HISCAM-scale and estimating a linear regression model. We re-estimate model 1 and 4 with ordered logistic regression (presented in the Appendix). The results of the two types of analyses are very similar. The order of the classes is identical, both estimates show relatively large distances around the skilled manual class, and they both show larger distances at the top of the hierarchy. Only one estimated effect is substantially different between the two types of models and this is commented on in the text.

4. Results

4.1. Descriptive results

To get a first impression whether men born in later cohorts started their careers at a higher occupational status and had a higher rate of growth in occupational status compared to earlier cohorts, we compared the occupational careers of four cohorts (men born between 1780–1804, 1805–1829, 1830–1854, and 1855–1880). Fig. 2 shows the average occupational status at different ages for the birth cohorts. There seem to have been no large differences between cohorts with respect to the average occupational status between the ages of 15 and 20. However, ten years later substantial differences can be observed. The oldest cohort, born between 1780 and 1804 had an average status of 54, whereas the status of the youngest cohort, born between 1855 and 1880 was on average 60. Similar differences remain until age 60. After that age the status of all four cohorts seems to have declined.

4.2. Explanatory results

The first model estimated (Model 0) is a random intercept model without any predictors (Table 4). The model shows that the average status of all men over their career is 57.5. The variance in occupational status between men is higher than the variation in occupational status within men. The intraclass correlation is 0.75 [156.6/(156.6 + 52.8)].

In Model 1 all the main effects of the time variant and time invariant individual characteristics were included. In this model, the level at which the career of the individuals begins is allowed to vary between them, while the rate at which their occupational status grows is kept constant across individuals. In this way career success is modelled without distinguishing between status at the start of the career and career growth. If we compare this model with the intercept model only, the unexplained variance within men is reduced from 52.8 to 47.6 (a difference of 10%), and the unexplained variance between men from 156.6 to 105.5 (33%).

As expected occupational status increased with work experience. A decade of work experience translated into an expected 2.33-point increase in status. Additionally, the effect of work experience decreased as an individual acquired more experience. This positive non-linear relationship of work experience on occupational status is in line with hypothesis 1: occupational status increases with work experience, but to a lesser extent as the individual gains more experience.[8]

Before turning to the test of the remaining hypotheses we first investigate whether men indeed differed with respect to career growth. We estimated Model 1 again, but now including a random slope of experience and the covariance of this slope and the intercept. The variance of the slope amounts to 9.4 and the new model fits the data significantly better than Model 1 (the deviance difference test is significant, $p < 0.01$). This indicates that the growth of status over the career differed between men. The covariance between the slope and the intercept is negative, indicating that men who started their career at a higher level experienced less growth.

In Model 2 effects on the occupational status at the start of the career are separated from effects on the growth of status during the career by including interaction effects with experience. Hypothesis 2a, which predicted that men with a higher educational level began their careers at a higher occupational status than individuals with lower education, is supported. Men who were scholars started their careers 1.13 points higher in status than men without schooling (the reference category), those who were apprentices started their careers 3.78 points higher, while those who achieved higher education ('students') started their careers, on average, 22.23 points higher in status. The effect for men whose educational achievement is unknown is non-significant. Men with unknown educational credentials do not differ from those with no education, which suggests that most men with unknown education were probably uneducated too.

The interaction between work experience and education is only significant for those who achieved higher education. The main effect of having been a student decreases by 0.77 status points for every 10 years of work experience. This means that the higher the educational achievement of men, the slower the rate of growth in occupational status. This would give support to hypothesis 2c over hypothesis 2b, the positive effect of education on the growth rate of occupational status decreased with work experience. However, this interaction effect becomes insignificant in our sensitivity analyses. If we estimate an ordered logistic regression model instead of a linear regression model, the returns to having been a student do not decline with work experience. We can, thus, not draw firm conclusions about this effect. All in all, as is evident from model 1, the total effect of education on men's career success (i.e. combining the effect on the starting level and career growth) is clearly positive.

Model 2 also supports hypothesis 4a that the occupational status of men at the start of their careers is positively affected by the occupational status of their father. A one unit increase in father's status yielded a 0.41-point increase in their son's occupational status. If we had excluded the level of education of individuals from the analysis, the 'total' effect of father's occupational status would have been larger, at 0.47. The direct transfer of status from father to sons is thus much larger than the indirect transfer through son's education.

[8] We investigated whether the effect of experience can indeed be interpreted as gaining occupational status with individual growth in experience. The alternative explanation would be an increasing overrepresentation of high status men at higher ages in our data. We estimated a version of Model 1 including within-individual and between-individual effects of experience and experience-squared. The between-individual effects are not significant whereas the within-individual effects are similar to those presented in Table 4. This indicates that the effects are not caused by selective observation of high-status men at higher ages.

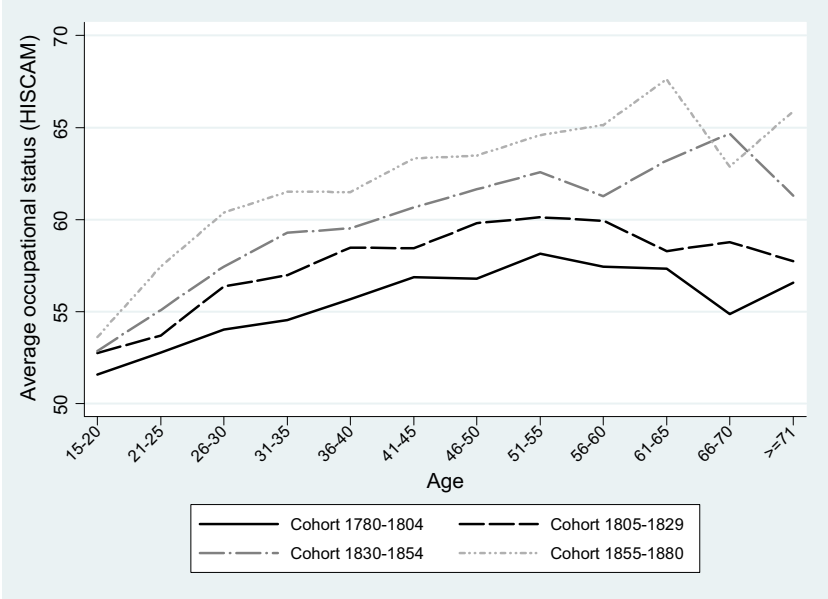

Fig. 2. Average occupational status by age group for four different birth cohorts
Source: Longitudinal Study of Residential Histories.

The effect of father's occupational status on the growth rate of son's status is significant, but in an unexpected direction. The higher the father's occupational status, the smaller the growth rate of son's status. Indeed, for every additional status point in the occupation of the father, the career growth is 0.01 status points less per 10 years of work experience. After 40 years of work, the advantage of having a father with 10 point higher status would no longer be 4.1, but only 3.7. This finding contradicts hypothesis 4b, that men whose fathers have a higher occupational status have a higher rate of growth in occupational status compared to men with fathers of lower occupational status. If we exclude education from the model, the 'total' effect of father's status on son's status growth remains negative (-0.01). The negative effect on status growth, however, is clearly outweighted by the positive effect on status at the start of the career (compare also the effect of father's status in Model 1).

Regarding the effect of migration, the results are exactly opposite to expected in hypotheses H3a and H3b. If men moved for economic reasons, their status immediately after the move is on average 2.74 points higher than before moving (the reference category), while we expected that their status would be negatively affected. Individuals who migrated for non-economic reasons also had a higher occupational status on average than before migrating (1.40 status points higher). And those who moved for unknown reasons also differ significantly in status compared with before migration (0.93 points in status). If we do not control for whether or not the place of destination was urban, the effects of the different types of migration would remain the same (this analysis is not in the table).

Concerning the interaction of work experience and migration, we observe significant negative effects for all the migration categories. The growth of occupational status is on average 2.77 points per 10 years for those who did not migrate, but only 2.58 for those who moved for economic reasons, 2.47 for those who moved for non-economic reasons, and 2.32 for those who moved for unknown reasons. This does not support hypothesis 3b, which predicted that migration boosted the growth of status over the occupational career.

In line with Hypothesis 5a men have a higher occupational status after marriage than before. Men's occupational status is on average 1.55 points higher after marriage than when single. If we had not controlled for ever having children, the positive effect of marriage on occupational status would have been higher (1.80 instead of 1.55). After having children, the occupational status of men is 0.41 points higher than before. There is no significant interaction between being married and work experience. Men do not have a higher growth rate in occupational status after marriage; hence hypothesis 5b is not supported.

It is worth noting that if individuals were unemployed before their current occupation, their status was negatively affected. On average, individuals who were previously unemployed were 4.45 points worse off in occupational status compared with individuals that were employed before their present occupation.

In Model 3, the interactions between birth cohort and the time variant and time invariant predictors are specified. This allows an assessment of the changes of the effect of these predictors over time. As was already suggested by Fig. 2, the subsequent birth cohorts started their careers a little bit higher (0.58-points per 10 year), supporting hypothesis 6a. Note that this effects is after taking educational expansion and the rise in father's occupational status into account. The total upgrading of the occupational distribution is considerably larger, as is shown in Table 2. Low status occupational groups, such as agricultural labourers decrease in size and high status groups, such as professionals and higher and intermediate managers, grow. If one would calculate the overall rise in status from Table 2 it would be about 10 status points.

However, the interaction between experience and birth cohort is not significant, which suggests—contrary to what was suggested by Fig. 2—that the growth in occupational status did not change over cohorts, leading us to reject hypothesis 6b. Later cohorts of men did not have a higher rate of growth in occupational status compared to earlier cohorts of men.

As hypothesis 7a predicted, the effect of father's occupational status on son's occupational status declined over time. Note that we do not include the three-way interaction between father's occupational status, experience, and birth cohort. The results thus pertain to men's average occupational status over their career. With the passage of every 10 years, 0.014 status points have to be subtracted from the main effect of father's occupational status (which was 0.40 in 1830). While the effect of one additional point in father's status on career success in 1780 was 0.47, this effect had been

Table 4
Multilevel analysis of occupational status (*N* individuals 6229; *N* occupational measurements 41,205).

	Model 0	Model 1	Model 2	Model 3	Model 4
Intercept	57.50***	26.07***	24.44***	24.52***	22.92***
Work experience/10		2.33***	2.77***	2.44***	2.74***
(Work experience/10)^2		−0.17***	−0.21***	−0.21***	−0.21***
Birth cohort (since 1780/10)		0.43***	0.43***	0.58***	0.59***
Education[a]					
Unknown education		0.30	0.51	0.48	0.63
Scholar		1.58***	1.13*	1.91***	1.50*
Apprentice		4.15***	3.78***	4.89***	4.38***
Student		20.94***	22.23***	21.55***	22.75***
Father's occupational status		0.39***	0.41***	0.40***	0.42***
Marital status[b]					
Married		1.54***	1.55***	1.56***	1.67***
Divorced/widowed		0.42	2.13**	0.94**	2.27***
Migration[c]					
Unknown reason		−0.45***	0.93***	0.00	0.92***
Non-economic reason		0.79***	1.40***	0.79***	1.40***
Economic reason		2.36***	2.74***	2.34***	2.73***
Children		0.56***	0.41**	0.44***	0.40**
Urban		1.26***	1.21***	1.20***	1.20***
Unemployed		−4.45***	−3.08**	−3.13**	−3.13**
Growth of occupational status					
Exp/10 * Education					
Unknown education			−0.12		−0.10
Scholar			0.24		0.25
Apprentice			0.28		0.28
Student			−0.77*		−0.77*
Exp/10*Father's occ. status			−0.01*		−0.01*
Exp/10 * Marital status					
Married			−0.09		−0.15
Divorced/widowed			−0.47		−0.48
Exp/10 * Migration					
Unknown reason			−0.45***		−0.44***
Non-economic reason			−0.30***		−0.30***
Economic reason			−0.19*		−0.19*
Change over birth cohorts (since 1780/10)					
Birth cohort * Education					
Unknown education				−0.08	−0.08
Scholar				−0.26	−0.26
Apprentice				−0.64**	−0.63**
Student				−0.35	−0.36
Birth cohort * Father's occ. status				−0.01***	−0.01***
Birth cohort * Marital status					
Married				−0.11*	−0.09
Divorced/widowed				−0.19	−0.19
Birth cohort * Experience/10				0.04	0.02
Variance between individuals	156.62	105.49	127.07	127.15	126.80
Variance within individuals	52.80	47.56	35.48	35.49	35.48
Variance slope (experience)			9.26	9.40	9.26
Cov slope intercept			−14.81	−15.06	−14.87
Log likelihood	−149,038.0	−146,048.7	−143,562.3	−143,577.9	−143,547.4
Deviance	298,075.9	292,097.4	287,124.5	287,155.8	287,094.8
Diff Deviance		5978.5	10,951.4	10,920.1	10,981.1
AIC	298,081.9	292,135.4	287,186.5	287,213.8	287,172.8

Source: Longitudinal Study of Residential Histories.
[a] Reference category: no schooling.
[b] Reference category: single.
[c] Reference category: Before migration.
Note: Year starts to count at 1780, and in the interaction year is centred around 1830.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

reduced to 0.33 status points in 1880. The total effect of father's status decreased over time as well. If we do not include the education variables in model 3, the negative interaction between father's status and birth cohort remains the same (−0.014).

Hypothesis 7b predicted that over birth cohorts, the effect of educational attainment would increase, but this is not the case. The only significant interaction is that of having an apprenticeship with birth cohort, and this effect is in the opposite direction: with every additional 10 years, the main positive effect of being an apprentice (which was 4.89 status points in 1830) is reduced by 0.64 points. We estimated an additional ordered logistic regression model with son's education as the dependent variable and father's status, birth cohort and the interaction between father's status and birth cohort as predictors. This model shows a strong positive effect of father's status on son's education that does not change over time either. The decline in the total effect of father's status on son's status is thus mainly the result of a decline in the direct effect of father's on son's status, and to a small extent the result of a decline in the returns

to the most traditional form of education. In any case the indirect effect of father's status through education did not increase during the century we observe.

Regarding the changes in the effect of marriage over time, hypothesis 7d is not supported: the effect of marriage decreased over cohorts rather than increased. With every additional 10 years, the main positive effect of marriage (which was 1.56 status points in 1830) is reduced by 0.11 points.

Model 4 is the final model which includes all the main effects of the time variant and time invariant predictors, the interactions over the life course, and the interactions over time. The direction and significance of the effects of the predictors remain the same if we compare model 4 with the previous models. The only exception is the change in the effect of marriage over time, which is no longer significant. At any rate, hypothesis 7d remains unsupported; the positive effect of marriage does not increase with birth cohort. Model 4 fits the data best, as the deviance between this model and model 1 is larger than the deviance of any other model when compared to model 1. The deviance difference test between model 4 (the final model) and the first model is significant ($p < 0.01$). When compared to Model 0, Model 4 reduces the unexplained variance between men from 156.62 to 126.80 and within men from 52.8 to 35.48, which means that model 4 explains around 20% of the variance between individuals and close to 33% of the variance within individuals.

5. Conclusion

The aim of this research was to study consequences of industrialisation on men's occupational careers in Britain, the country that first experienced industrialisation. We expected men's careers to become more successful during industrialisation and society to become more open. Both expectations are partly supported.

We found that men born around 1880 indeed had on average a higher status throughout their career than men born around 1780. The total gain was about ten status points, of which half could be explained by educational expansion and the rise in father's status. The remaining rise in status mainly came about through later cohorts starting their career at a higher level than earlier cohorts. Later cohorts did not gain more status during their career than earlier cohorts. These findings are very much in line with those of Schulz and Maas (2012) for occupational careers of Dutch men during industrialisation. They too found an increase in status mainly at the start of the occupational career, albeit smaller than the increase in Britain. Neither study found the expected faster growth of status when industrialisation proceeded. Such a faster growth was expected because higher status occupations became available and because big organisations increasingly organised labour in ordered careers. But maybe these changes were offset by experience from the traditional occupations becoming less useful in the industrialised society.

The main difference between the Dutch and the British findings with respect to the shape of occupational careers is that the Dutch careers seemed to peak at a much earlier age (before age 40) than the British careers that kept rising until very high ages. Maybe the early peak in the Netherlands is an artefact of the relatively low number of observations per individual (2.4) that make it difficult to estimate the shape of the career. In the present study the average number of observations is 6.6 per individual. Additional analyses separating between-individual with within-individual effects of work experience show that it is unlikely that this result is caused by an overrepresentation of long successful careers in the dataset. However, it is possible that the difference is the result of relatively imprecise measurement of occupational status (in only eleven groups) in the British data. This does not allow to observe small declines in status.

A strong effect of educational attainment and a weak effect of father's occupational status on son's occupational success are indicators of an open society. Previous research on 19th century Britain found that education had a positive effect on occupational status, but father's occupational status exerted a much greater influence (Mitch, 2005; Long, 2006). Our results are similar. In particularly higher education, which was not considered in previous research,[9] and father's occupational status were strong predictors of son's status. These effects came about at the start of the son's career. Unexpectedly, men of higher origin gained less status over their career than men of lower origin and less education. It may have been the case that those who entered the labour market at a very high level, e.g. as physicians or judges, simply could not make much of a career because there were no higher occupations to achieve. This would support Sørensen's (1977) vacancy competition model.

British society became more open during industrialisation. The effect of father's occupational status on son's status declined with 30%. This did not coincide with a growing importance of education. To the contrary, apprenticeships, the most traditional form of education, were a better preparation for the labour market at the end of the 18th century than one century later. This may be a result of industrialisation eroding the traditional craft sector and progressively replacing it by the larger-scale manufacturing sector (Miles, 1999). The inequality in educational opportunities was large and did not change during the century that we observe. As a result of these developments, the total effect of father's status on son's status declined as well. These results are not only in line with previous research on career mobility during industrialisation in the Netherlands (Schulz & Maas, 2012), but also with research on intergenerational mobility during industrialisation in Britain (e.g. Miles, 1993). The latter study lacked an indicator of educational attainment, but showed a decrease in the total effect of father's on son's occupation.

Another, less often used, indicator of increasing openness of British society during industrialisation is that there is some indication that married men gradually lost their advantage over single men. Since the effect of marital status is probably partly due to discrimination of single men in the labour market and support of the father-in-law, we might interpret this change as an increase of efficiency in the labour market. This was contrary to our expectation. We expected discrimination to increase due to the spread of the male breadwinner model during industrialisation. It seems that rationalisation in the labour market won from societal norms.

Our findings with respect to migration are puzzling. Whereas modern research showed negative short term effects and positive long term effects of migration (Smits, 2001), our study showed the opposite. The occupation after migration was on average of a higher status than that before migration, but this advantage became slowly smaller over time, although it definitely did not fade away completely. This suggests that many men migrated who already had access to a higher status occupation elsewhere. They did not move to a new region with good economic prospects and subsequently started to search for a job, but they first searched for a better job and then moved. After migration they thus entered a higher status job, but they also suffered temporarily from a lack of social capital

[9] To assess the effect of schooling on occupational status, Long (2006) investigated whether individuals present in the 1881 census were enrolled in school in 1851. He created two dummy variables, one for those enrolled between age 6 and 9 and another for those who were enrolled between age 10 and 13. The latter variable measures at most lower secondary education. Mitch (2005) studied the effect of literacy, i.e. the ability to sign the marriage act. Thus the effects of higher levels of education, such as apprenticeships and higher education, were not included in these studies.

giving those who did not move the opportunity to catch up with them a little. The finding that all types of migration positively affected men's occupational status, and not only migration for economic reasons, may be explained by the difficulty in determining the real reasons of men for migrating. Pooley and Turnbull (1996) pointed out that data provided by family historians on reasons for migration must be handled with caution as in many cases they may have been inferred rather than based on direct evidence, and in many other cases the reasons for migration are a complex variety of reasons which cannot adequately be remembered or recorded.

The data that we used were not intended to study the occupational status of individuals over their life course, but rather their history of residential moves. This may have biased our results. First, some men may have had no chance to end up in our study, because they never moved. As we argued before, we don't think that this is a large part of the population, since most men at least migrated once in their life to leave the parental home. Secondly, and potentially more problematic, we have more complete information on the occupational career of those men who moved more often. Our findings suggest that migration had a positive impact on occupational status. We thus overestimate the average status in Britain at the time. But we do so especially in the first half of the observation period. The likelihood of migration increased for birth cohorts born between 1780 and 1835 and stabilised thereafter. This is visible in the average number of moves per man. For earlier periods in which there is less migration we thus observed a smaller part of the population, and for those that we do observe, a smaller part of their career, than for later periods in which there is more migration. The effect of migration did not change over time (analyses not shown). The selection of successful men is thus stronger in the first period. This would mean that career success of men during industrialisation increased more than we observed. The spread of literacy over the population probably had a similar effect. The likelihood that literate men left some information for the family historian to find, was probably larger than that of illiterate men. At the same time, literate men were more successful. Through the spread of literacy over the century we observed, the data on occupational careers became more representative, more often including less successful careers.

In future research it would be desirable to unravel the effects that different processes of modernisation had on career success. In this study, the overall effect of these long-term historical changes are indirectly measured through the passage of time, but with the appropriate data it would be possible to assess the influence of industrialisation, the expansion of education, and the proliferation of less traditional values, that possibly undermined the importance of ascriptive factors on the life chances of individuals. Previous research in the Netherlands has advanced in this vein. Schulz (2013) studied how modernisation processes affected career success, while Knigge et al. (2014) studied their effect on intergenerational mobility.

To conclude, our study of the occupational careers of British men during industrialisation showed a modest increase in occupational status over time. Both father's occupational status and son's education were very important predictors of career success. The importance of education did not grow over time, but the impact of father's status on the career success of his son decreased substantially across birth cohorts. This supports the modernisation thesis: during industrialisation Britain became a more open society.

Acknowledgements

This article is based on the master thesis of the first author. We are grateful to participants of the Research Master in Sociology and Social Research (class 2014) at Utrecht University for their comments on earlier versions of this article and to the Cambridge Group for the History of Population and Social Structure which provided us with population data from the census reports of England and Wales from 1801 to 1891 (funded by two grants of the ERSC: RES-000-23-0131 and RES-000-23-1579). Finally, this project was supported by Becas Chile-CONICYT who financed the first author's stay in the Netherlands.

Appendix.

Multilevel ordered logistic analysis of occupational status measured in 11 categories (*N* individuals 6229; *N* occupational measurements 41,205).

	Model 1	Model 4
Work experience/10	0.60***	1.02***
(Work experience/10)^2	−0.04***	−0.06***
Birth cohort (since 1780/10)	0.17***	0.29***
Education[a]		
Unknown education	0.22	0.51**
Scholar	0.53**	0.72**
Apprentice	1.66***	2.30***
Student	7.74***	9.19***
Father's occupational status	0.14***	0.18***
Marital status[b]		
Married	0.48***	0.63***
Divorced/widowed	0.19*	0.73**
Migration[c]		
Unknown reason	−0.09*	0.38***
Non-economic reason	0.22***	0.47***
Economic reason	0.65***	0.90***
Children	0.16***	0.10*
Urban	0.34***	0.39***
Unemployed	−1.06***	−0.82*
Growth of occupational status		
Exp/10 * Education		
Unknown education		−0.10*
Scholar		0.05
Apprentice		−0.01
Student		0.18
Exp/10 * Father's occ. status		−0.01***
Exp/10 * Marital status		
Married		−0.06
Divorced/widowed		−0.17
Exp/10 * Migration		
Unknown reason		−0.17***
Non-economic reason		−0.11***
Economic reason		−0.05
Change over birth cohorts (since 1780/10)		
Birth cohort * Education		
Unknown education		−0.04
Scholar		−0.12
Apprentice		−0.28**
Student		−0.13
Birth cohort * Father's occ. status		−0.01***
Birth cohort * Marital status		
Married		−0.04*
Divorced/widowed		−0.08
Birth cohort * Experience/10		0.00
Cut off points[d]		
1	4.40***	7.22***
2	5.94***	9.04***
3	6.34***	9.52***
4	7.25***	10.60***
5	8.53***	12.11***
6	9.16***	12.86***
7	12.61***	16.89***
8	12.81***	17.14***
9	14.10***	18.72***
10	17.25***	22.63***
Variance between individuals	12.21	21.72
Variance slope (experience)		1.32
Cov slope intercept		−2.54

Appendix (*Continued*)

	Model 1	Model 4
Log likelihood	−61,598.9	−59,326.0
Wald χ^2 (16)	5337.3	4308.2
p	0.000	0.000

Source: Longitudinal Study of Residential Histories.

[a] Reference category: no schooling.

[b] Reference category: single.

[c] Reference category: Before migration.

[d] For a description of the categories, see Table 2. Note: Year starts to count at 1780, and in the interaction year is centred around 1830.

[*] $p < 0.05$.

[**] $p < 0.01$.

[***] $p < 0.001$.

References

Allmendinger, J. (1989). *Career mobility dynamics: A comparative analysis of the United States, Norway and West Germany*. Berlin: Max-Planck-Institut für Bildungsforschung.

Arrow, K. J. (1973). Higher education as a filter. *Journal of Public Economics*, *2*, 193–216.

Barone, C., & Schizzerotto, A. (2011). Introduction. *European Societies*, *13*, 331–345.

Barone, C., Lucchini, M., & Schizzerotto, A. (2011). Career mobility in Italy. A growth curves analysis of occupational attainment in the twentieth century. *European Societies*, *13*, 377–400.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, *70*, 9–49.

Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. New York: Wiley.

Blossfeld, H. P. (1986). Career opportunities in the Federal Republic of Germany: A dynamic approach to the study of life-course, cohort, and period effects. *European Sociological Review*, *2*, 208–225.

Bourdieu, P., & Passeron, J. C. (1977 [1994]). *Reproduction in education, society and culture*. London: Sage.

Chiswick, B. R. (1999). Are immigrants favorably self-selected? *American Economic Review*, *89*, 181–185.

Collins, R. (1971). Functional and conflict theories of educational stratification. *American Sociological Review*, *36*, 1002–1019.

Davis, K. (1955). Social and demographic aspects of economic development in India. In S. Kuznets, W. E. Moore, & J. J. Spengler (Eds.), *Economic growth: Brazil, India, Japan* (pp. 263–315). Durham, NC: Duke University Press.

Grusky, D. B. (1983). Industrialization and the status attainment process: The thesis of industrialism reconsidered. *American Sociological Review*, *48*, 494–506.

Hobsbawm, E. J. (1962). *The age of revolution. Europe 1789–1848*. London: Weidenfeld and Nicolson.

Horrell, S., & Humphries, J. (1995). Women's labour force participation and the transition to the male-breadwinner family, 1790–1865. *Economic History Review*, *48*, 89–117.

Joyce, P. (1990). Work. In F. M. L. Thompson (Ed.), *The Cambridge social history of Britain, 1750–1950* (Vol. 2) (pp. 131–195). Cambridge: Cambridge University Press.

Kalmijn, M., & Luijkx, R. (2005). Has the reciprocal relationship between employment and marriage changed for men? An analysis of the life histories of men born in the Netherlands between 1930 and 1970. *Population Studies*, *59*, 211–231.

Kerr, C., Dunlop, J. T., Harbison, F. H., & Myers, C. A. (1960). *Industrialism and industrial man*. Cambridge, MA: Harvard University Press.

Kingsford, P. (2006). *Victorian railwaymen: The emergence and growth of railway labour, 1830–1870*. New York: Taylor, Francis.

Knigge, A., Maas, I., Van Leeuwen, M. H. D., & Mandemakers, K. (2014). Status attainment of siblings during modernization. *American Sociological Review*, *79*, 549–574.

Korenman, S., & Neumark, D. (1992). Marriage, motherhood, and wages. *Journal of Human Resources*, *27*, 233–255.

Kuznets, S. (1957). Quantitative aspects of the economic growth of nations: II: Industrial distribution of national product and labor force. *Economic Development and Cultural Change*, *5*, 1–111.

Lambert, P. S., Zijdeman, R. L., Van Leeuwen, M. H. D., Maas, I., & Prandy, K. (2013). The construction of HISCAM: A stratification scale based on social interactions for historical comparative research. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, *46*, 77–89.

Lin, N. (1999). Social networks and status attainment. *Annual Review of Sociology*, *45*, 467–487.

Long, J. (2005). Rural–urban migration and socioeconomic mobility in Victorian Britain. *Journal of Economic History*, *65*, 1–35.

Long, J. (2006). The socioeconomic return to primary schooling in Victorian England. *Journal of Economic History*, *66*, 1026–1053.

Maas, I. (2004). The use of event-history-analysis in career research. In D. Mitch, J. Brown, & M. H. D. van Leeuwen (Eds.), *Origins of the modern career* (pp. 56–76). Aldershot: Ashgate.

Maas, I., & van Leeuwen, M. H. D. (2004). Occupational careers of the total male labor force during industrialization: The example of nineteenth-century Sweden. In D. Mitch, J. Brown, & M. H. D. van Leeuwen (Eds.), *Origins of the modern career* (pp. 227–258). Aldershot: Ashgate.

Manzoni, A., Härkönen, J., & Mayer, K. U. (2014). Moving on? A growth-curve analysis of occupational attainment and career progression patterns in West Germany. *Social Forces*, *92*, 1285–1312.

Miles, A. (1993). How open was nineteenth-century British society? Social mobility and equality of opportunity 1839–1914. In A. Miles, & D. Vincent (Eds.), *Building European society: Occupational change and social mobility in Europe 1840–1940* (pp. 18–39). Manchester: Manchester University Press.

Miles, A. (1999). *Social mobility in nineteenth-and early twentieth-century England*. Basingstoke: Macmillan.

Miles, A., & Savage, M. (2004). Constructing the modern career, 1840–1940. In D. Mitch, J. Brown, & M. H. D. van Leeuwen (Eds.), *Origins of the modern career* (pp. 79–101). Aldershot: Ashgate.

Mitch, D. (2004). Agricultural labour as a career: Norfolk farm workers in the late nineteenth and early twentieth centuries. In D. Mitch, J. Brown, & M. H. D. van Leeuwen (Eds.), *Origins of the modern career* (pp. 281–304). Aldershot: Ashgate.

Mitch, D. (2005). Literacy and occupational mobility in rural versus urban Victorian England: Evidence from the linked marriage register and census records for Birmingham and Norfolk, 1851 and 1881. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, *38*, 26–38.

Osterman, P. (1984). . *Internal labor markets* (Vol. 1) Cambridge, MA: The MIT Press.

Pfau-Effinger, B. (2004). Socio-historical paths of the male breadwinner model – An explanation of cross-national differences. *British Journal of Sociology*, *55*, 377–399.

Polachek, S. W. (2008). Earnings over the life cycle: The Mincer earnings function and its applications. *Foundations and Trends in Microeconomics*, *4*, 165–272.

Pooley, C. G., & Turnbull, J. (1996). Migration and mobility in Britain from the eighteenth to the twentieth century. *Local Population Studies*, *57*, 50–71.

Pooley, C. G., & Turnbull, J. (1997). Changing home and workplace in Victorian London: The life of Henry Jaques, shirtmaker. *Urban History*, *24*, 148–178.

Prandy, K., & Bottero, W. (2000). Reproduction within and between generations: The example of nineteenth-century Britain. *Historical Methods*, *33*, 4–15.

Robert, P., & Bukodi, E. (2002). Dual career pathways: The occupational attainment of married couples in Hungary. *European Sociological Review*, *18*, 217–232.

Schulz, W. (2013). *Careers of men and women in the 19th and 20th centuries* (Unpublished doctoral dissertation). Utrecht University.

Schulz, W., & Maas, I. (2010). Studying historical occupational careers with multilevel growth models. *Demographic Research*, *23*, 669–696.

Schulz, W., & Maas, I. (2012). Studying career success: The role of resources and norms for occupational status attainment in the Netherlands, 1865–1940. *European Sociological Review*, *28*, 220–240.

Seccombe, W. (1986). Patriarchy stabilized: The construction of the male breadwinner wage norm in nineteenth-century Britain. *Social History*, *11*, 53–76.

Shpayer-Makov, H. (2004). Job stability and career opportunities in the work-life history of policemen in Victorian and Edwardian England. In D. Mitch, J. Brown, & M. H. D. van Leeuwen (Eds.), *Origins of the modern career* (pp. 101–125). Aldershot: Ashgate.

Sjaastad, L. A. (1962). The costs and returns of human migration. *Journal of Political Economy*, *70*, 80–93.

Smits, J. (2001). Career migration, self-selection and the earnings of married men and women in the Netherlands, 1981–93. *Urban Studies*, *38*, 541–562.

Sørensen, A. B. (1977). The structure of inequality and the process of attainment. *American Sociological Review*, *42*, 965–978.

Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, *87*, 355–374.

Treiman, D. J. (1970). Industrialization and social stratification. In E. O. Laumann (Ed.), *Social stratification: Research and theory for the 1970s* (pp. 207–234). New York: Bobbs-Merrill Company.

Van Leeuwen, M. H. D., & Maas, I. (2010). Historical studies of social mobility and stratification. *Annual Review of Sociology*, *36*, 429–451.

Van Leeuwen, M. H. D., Maas, I., & Miles, A. (2004). Creating a historical international standard classification of occupations: An exercise in multinational interdisciplinary cooperation. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, *37*, 186–197.

Wallis, P. (2008). Apprenticeship and training in premodern England. *Journal of Economic History*, *68*, 832–861.

Weisdorf, J. L. (2006). From domestic manufacture to industrial revolution: Long-run growth and agricultural development. *Oxford Economic Papers*, *58*, 264–287.