# Accelerated School-to-Work transition in Britain: Still true?

*This paper investigates whether the British pattern of the transition to adulthood with an early transition from school to work still exists. We apply sequence analysis to combined life histories from the British Household Panel Survey (BHPS) and the Understanding Society study (UKHLS) to gain a holistic picture of how education and employment trajectories of young adults born between 1974 and 1990 in England and Wales differ by birth cohort, gender, and socio-economic background. Next, we investigate how various trajectories lead to inequalities in labour market outcomes in later life. Around half of young people in the sample follow the rapid school-to-work trajectories with around one third of young adults obtaining a higher education degree by age 26. The distinctive British early transition from school to work is still prevalent, although trajectories have become more complex and precarious, in particular among young people from lower socio-economic backgrounds. Yet, the decrease in the direct school-to-work trajectories among the youngest cohort was replaced by the prolonged stay in education and increase in part-time employment. The proportion of university graduates from lower socio-economic backgrounds has increased among the youngest cohort yet remains disproportionally low. Consequently, the chances of being in professional and managerial occupations remain significantly lower among highly educated young people from disadvantaged backgrounds.*

# 1 Introduction

Employment and education careers of young people are embedded in the complex structure of various life course developments during the transition to adulthood, including partnership and family transitions, and housing and residential trajectories. As a result of a various socio-economic changes, such the expansion of higher education, increase in gender equality and decrease in normative controls, life course transitions during the early stage of adulthood becoming less standardised, more turbulent, individualised, and "protracted" (Billari & Liefbroer, 2010; Elzinga & Liefbroer, 2007; Huinink, 2013; Liefbroer, 1999; Macmillan, 2005; Shanahan, 2000).

The British pattern of the transition to adulthood is usually described as "accelerated" with an early transition from school to work (Bynner, 2001; Cavalli & Galland, 1995). This tradition stems from open labour market relationships based on free market forces and competition and a flexible education and training system that allows various pathways of obtaining necessary work qualifications (Blossfeld et al., 2005; Raffe et al., 1998; Bynner, 2001; Mills & Blossfeld, 2003). The shift to a service economy starting in the 1970s and rapid development of information technology led to the restructuring of the labour market and a subsequent polarisation of jobs (Ashton et al., 1990; White, 1992; Goos & Manning, 2007). As the increased demand for highly skilled labour led to the expansion of higher and further education and offered career prospects for some, less advantaged young people were left with greater uncertainty. Yet, the British youth which has had positive perceptions regarding future career prospects without continuing education, faced a new reality of scarce employment opportunities without having specific qualifications (Roberts et al., 1994; Maguire & Maguire, 1997; Bynner, 2001).Thus, the traditional rapid school-to-work trajectories have become harder to achieve and posed a greater pressure on young people's decisions of post-school activities.

Most recent developments such as widening participation in higher education among young people from lower socio-economic backgrounds and women (Murphy et al., 2018) suggest widening of opportunities and choices among young adults. On the other hand, and increased uncertainty due to the restructuring of the labour market could have resulted in the prevalence of more structured pathways.

This paper contributes to the literature in two ways. Frist, we conduct sequence analysis on combined life histories from the British Household Panel Survey (BHPS) and the

Understanding Society study (UKHLS) in order to gain a holistic picture of changes and continuities in school-to-work pathways of young people between 1991 and 2016 and factors affecting it. Second, we investigate the link between the trajectories and the occupational outcomes at age 26. Previous work has focused mainly on early labour market outcomes, such as destination of graduates' trajectories and one year post-graduation or measured the returns to education at a specific age, e.g. age 33 in Blundell et al. (2000) or Blanden et al. (2004). Although, these studies usually advocate towards better employment prospects among highly educated, they have ignored how school-to-work pathways have affected the occupational outcomes. We investigate occupational outcomes at age 26 by taking into account how various transitions in education and employment careers affect labour market prospects and to which extent outcomes are dependent on individual characteristics (e.g. gender and parental socio-economic background).

## 2.2 Research questions

We address three key research questions outlined below:

1) How have education and employment trajectories changed since the rapid expansion of further and higher education in the beginning of 1990s?
2) How do education and employment trajectories influence occupational outcomes 10 years after completing compulsory school education?
3) How does education affect occupational outcomes with regards to cohort, gender, and parental socio-economic background?

### 2.2.1 The British pattern of the transition to adulthood

Socio-economic and cultural changes which occurred in society since the 1960s (and often referred as the Second Demographic Transition (van de Kaa, 1987)) have dramatically influenced young people's lives in industrialised countries, leading to de-standardisation and individualisation of life trajectories (Buchman, 1989; Liefbroer, 1999; Schanahan, 2000; Macmillan, 2005). The decrease in normative controls and increased individualisation of the life course has led to a larger freedom of personal life decisions and greater extent of fulfilling own pursuits in various life domains, leading to the expansion of biographical trajectories (Shanahan, 2000; Macmillan, 2005; Huinink, 2013).

Although, a lot of evidence was found in favour of de-standardisation and individualisation of the life course, there exists another point of view showing the prevalence of structured trajectories defined by socio-economic origins (Côté, 2002; Furlong & Cartmel, 2007; Côté & Bynner, 2008; Furstenberg, 2008). Traditionally, education and employment trajectories of young people in Britain were found to be largely influenced by social class, gender, and ethnicity (Bynner, 2001, 2005; Cavalli & Galland, 1995; Coffield, 1995). These differences in British society are often referred to as "youth divide" – the polarisation between the advantaged and the disadvantaged – and the existence of so called "fast-" and "slow-track" in the transition to adulthood (Bynner 2001, 2005, Jones 2002).

"Slow-track" is associated with prolonged pathways to adulthood and "positive" individualisation which allows young people from more advantaged backgrounds to find their own flexible way to explore various options in life. This flexibility often leads to prolonged periods spent in education and the postponement of entering the labour market and family formation. Following the "slow-track" was found to be more prevalent among young people whose parents have tertiary education (Bynner & Joshi, 2002; Patiniotis & Holdsworth, 2005).

"Fast-track", on the contrary, relates to young people from lower socio-economic background who tend to leave school at minimum age 16 and rapidly start work and family careers. The routes of the existence of the "fast track" lie in the tradition of a high demand for unskilled youth in labour-intensive industries in Britain which allowed young people to enter the labour market straight after finishing the compulsory school without any further qualifications before 1990s (Ashton et al., 1990; Maguire & Maguire, 1997). The shift of the economy towards service activities has resulted in increasing polarisation among young people. On the one hand, the rising demand was observed in high-skilled and well-paid professional and managerial occupations. On the other hand, technology could not substitute the low-paid nonroutine manual skilled labour, which requires high levels of soft skills (Goos & Manning, 2007). Thus the high demand for the service jobs (e.g. carers and low-level hospitality positions) and the decrease in the number of "middling" jobs supported the persistence of a "low skills equilibrium" in many places and sectors (Ibid., Finegold & Soskice, 1988; Government Office for Science, 2017). Nevertheless, even in the low-skilled sector young people were confronted with the need of further training before applying for the job (Bynner, 2001; Gallie et al., 2014), which stimulated the expansion of higher and further education.

As a response to the economic restructuring towards highly technological services, the higher education participation rate has increased gradually from 12% in 1979 to 30% in the early 1990s, and 49% in 2015 (Department for Education, 2017). Increases in enrolment rates vary markedly across population subgroups, with women and young people from lower socio-economic background historically showing lower participation rate (Broecke & Hamid, 2008; Murphy et al,. 2018). In 1992, women's higher education participation rate exceeded men's. In 2015, women's rate was 55% compared to 43% in men (Department for Education and Skills/Department for Business Innovations and Skills 2017). Since the increases in tuition fees in 2003 and 2009 and the abolishment of the system of upfront payment for education, the participation rate among young people from lower socio-economic background has increased substantially. Still the proportion of people from more advantaged backgrounds who go into higher education is still more than two times larger than the proportion of young people from lower socio-economic groups (Department for Education 2017).

The "slow-" and "fast-track" division of youth has been criticized for not taking into account economic precarity which might stand in a way of rapid transitions (Stone et al., 2011) as well as overlooking the existence of the "middling" pathway (Roberts 2011,2013; McDonald, 2011). Yet, one on the one hand, we observe an increase in the variety of educational options after school, but on the other, these opportunities might be structurally limited. Therefore, we expect to see an increased diversity in the sequences of events careers over time, but we anticipate them to vary by cohort, gender, and parental SES.

### 2.2.2 Long-term labour market precarity

The restructuring of the labour market in the UK has significantly disadvantaged the employment prospects of young people by lowering prospects and increasing labour market uncertainty, especially among lower socio-economic groups. On the one hand, this reflected in the high proportion of NEETs[1]. On the other hand, the terms of employment have become more uncertain as well, thus, an increase in prevalence of temporary and zero hours contracts (Williamson, 1997; MacDonald, 1997; Berrington et al., 2014; Furlong et al., 2018) as well as the persistence of the "low-pay, no-pay cycles" (sequences of

[1] The proportion of NEETs has been holding at the level of around 13% among 16-24 years in the early 2000s, went up to 19% in 2011 and stabilised later at the level of 11-12% until today (House of Commons, 2018)).

periods of low pay and worklessness; Schieldrick et al., 2010;) among young people was observed.

The youth unemployment rate has been steadily increasing throughout the 2000s reaching the level of 22% in 2011 and decreased to 13% in 2016 (ONS, 2017). The increase in youth unemployment poses a threat on young people's careers in the long-term. Individuals experiencing longer spells of unemployment find it harder to find a new job and are at risk of losing some of their skills (Arumlampalam, 2001; Bell & Blanchflower, 2010). The first spell of unemployment, especially for those transitioning to labour market straight from school, has the largest scarring effect on future employment and earnings (Arumlampalam, 2001; Gregg & Tominey, 2005; Bell & Blanchflower, 2010; Sissons & Jones, 2012).

Previous research has shown that employment outcomes throughout the early years of adulthood (both in terms of occupation and employment conditions) were quite persistent and varied by educational qualifications, leaving the low educated in the most precarious labour market positions, i.e. long-term unemployed and non-active (Crawford et al., 2008: Howieson & Ianelli, 2008). Both unemployment and NEETs rates have shown to be much higher for young people with no qualification compared to graduates (Sissons & Jones, 2012, Bell & Blanchflower, 2010, Burgess et al., 2003).

We hypothesize that longer spells of unemployment and non-activity during the early adult years have a negative long-term effect on occupational outcomes in later life.

### 2.2.3 Returns to education

Education is considered an important predictor of future income trajectories, occupational and social mobility. Salary returns to education have been shown to vary with the level of qualification, parental socio-economic background and gender (Card, 1999; Dearden et al., 2002; Sianesi, 2003; Friedman et al., 2017). Much less is known about the short- and long-term occupational outcomes and mobility.

In the UK, returns were found to be universally higher for academic than vocational training, although after taking into account time spent in education, the actual earnings return per year become closer between the two (e.g. Dearden et al., 2002). Significant differences were found with regards to the type of vocational training (e.g. largest pay-off

was observed in teaching and nursing qualifications) whereas the wage premium was small (Ibid.). Research has shown that despite an increase in the numbers of highly educated young people in the 1990s, no decrease has been observed in the returns, with highly educated showing higher occupational progression and income trajectories (Harkness & Machin, 1999; Sianesi, 2003; Walker & Zhu, 2003; McIntosh, 2006).The latter suggests that educational differences in occupational and earning are expected to be found, yet it is unclear whether the magnitude of this effect will vary by cohort.

Pronounced gender differences were found in regards to education and earnings. Gender pay gap is a prominent long-standing feature of the UK labour market (Harkness, 1996; Olsen et al., 2018). The differences are especially pronounced between low educated men and women. Low educated women were found to be the more disadvantaged financially and often excluded from the labour market (Howieson & Ianelli, 2008; Bynner & Parsons, 2001), with a persistently higher proportion of NEETs among 16-24 year olds as compared to men (ONS, 2018). On the contrary, highly educated women had better chances to occupy professional and managerial positions than men, yet the gender pay is still observed (Blundell et al., 2000, Dearden et al., 2002; Sianesi, 2003). The gap was found to be decreasing with the level of education, with the lowest difference found among highly educated men and women (Blundell et al., 2000). With the increased feminisation of higher education and the labour market, we expect gender differences in occupational outcomes to become smaller among highly educated men and women. Although, no evidence suggests expecting an improvement of the labour market prospects among low educated women, as compared to men.

The increase in higher education enrolment rates over the past two decades was observed alongside the decrease in occupational mobility. Nightingale et al. (2017) have shown that the rates were relatively stable between 1992 and 2005, with around 20% of young people experiencing upward mobility and around 12-13% experiencing downward mobility. Both rates have decreased by about a half between 2005 and 2013, with a slight recovery observed in the recent years. The decrease in social mobility was to large extent stimulated by the emerged skills mismatch on the labour market. Thus, the increase in the numbers of highly educated people could not ensure the successful entry into the labour market among all graduates. Skills surpluses therefore may be seen as underutilisation and overqualification (Felstead & Green, 2013). The estimates show that around 25-30% of UK

graduates reported being overqualified for their jobs (Battu et al., 2000; Chevalier & Lindley, 2009).

Although the numbers of highly educated young people from lower socio-economic background have increased, a persistent gap in future career trajectories and earnings is still observed, compared to highly educated young people from higher socio-economic groups (Friedman et al., 2017). We therefore expect occupational outcomes to still be vastly effected by personal socio-economic background.

## 3.1 Data, methods, and variables

### 3.1 Data

For the analysis, we used the combined data from the British Household Panel Survey (BHPS) and the Understanding Society study (UKHLS) (Institute for Social and Economic Research 2010, 2014; Institute for Social and Economic Research et al. 2016). The BHPS is an annual panel survey of a nationally representative sample of about 5,500 households and 10,000 individuals recruited in 1991. The survey contains 18 waves conducted between 1991 and 2009. The dataset contains detailed information on educational and employment changes, residential changes, and parental socio-economic characteristics. The dataset contains information on the economic activity status, educational attainment and type of occupation by various classifications, start date of up to 2 employment spells per year. Only spells reported as primary economic activity were taken into consideration. Additionally, completed educational and employment histories of the respondents were collected in BHPS: Wave 2 (1992-1993), Wave 11 (2001-2002), and Wave 12 (2002-2003); and UKHLS: Wave 1 (2009-2010; for the new entrants) and Wave 5 (2013-2015).

The UKHLS was launched in 2009 as a successor of the BHPS and has recruited more than 50,000 new respondents in Wave 1, boosting substantially the ethnic minority subsample. A subsample of BHPS respondents was followed from Wave 2 (2010) onwards. This means the full employment and education sequences could be constructed from year 1991. Due to the limited representativeness of ethnic minorities in BHPS, our analysis does not look into ethnic differences in education and employment trajectories. The UKHLS has 7 waves of data, although, only 6 waves were available by the time this analysis was conducted. The UKHLS and BHPS have the same survey design and collect similar information on major life events. We extended the observation window for the original BHPS sample for 6 years

using UKHLS data to allow us to investigate employment and education careers of younger cohorts born in the 1980s as well. We focused our analysis on people who turned 16 between 1991 and 2008 in England and Wales and followed them for as long as they remained in the survey. The sample is restricted to respondents for whom 10-year employment and education histories between the years they turn 16 and 26 could be constructed. The final sample contains 1,401 individuals from three birth cohorts observed between 1991 and 2015: 1974–79 (721 persons), 1980–84 (451 persons) and 1985–90 (229 persons).

## 3.2 Methods

First, sequence analysis is used to define educational and employment trajectories and assess the persistence of the traditional British pattern of accelerated School-to-Work transition. Then, multinomial logistic regressions are employed to investigate the role of the family and personal background characteristics in influencing individual educational and employment trajectories during the transition to adulthood, and to analyse the way these trajectories lead to a particular occupational outcome at age 26.

### 3.2.1 Sequence analysis

Sequence analysis represents each individual life course by a string of states and aims to describe and visualise sequences, compare individual sequences and identify the common types of sequences among populations of interest (Abbott, 1995). The method allows to study a longitudinal series of interrelated transitions (e.g. from being unemployed to being employed part-time and then full-time), as opposed to the vast majority of methods used in the life course research which usually focus on one transition (e.g. logistic regression or basic event history models). Sequence analysis has been widely used while analysing school-to-work trajectories (Halpin & Chan, 1998; Scherer 1999; McVicar & Anyadike-Danes 2002; Quintini & Manfredi, 2009).

A first task is to define standard educational and employment trajectories. At the beginning of the observation period, individuals are aged 16 and are in full-time education (finishing secondary school). As time passes, we distinguish between the five economic activity states that young people are going through: employed full-time, employed part-time, full-time student, unemployed, economically inactive. The category “non-active” (economically

inactive) refers to individuals involved in family care, being sick or disabled, taking parental leave, governmental training.

Once individual sequences are created, due to the large possible number of combination of states, an appropriate distance measure is used to reduce the number of sequences and make them more similar. Similarity and dissimilarity between individual sequences are defined in terms of the number, order, and duration of states within the sequences. The algorithm of transforming one sequence into another includes three operations: substitution (one state is substituted with another), insertion (an additional state can be added at any place in the sequence), and deletion (any state can be deled to make sequences more similar). All operations come at a "cost" which the researcher defines arbitrary based on theory or empirical estimations. The distance between two sequences is defined by the minimum "cost" of operation that could be undertaken to transform one sequence into another (Abbott & Tsay, 2000).

To compare the monthly sequences of individual trajectories, we use the specification of Dynamic Hamming Distance (DHD) measure. DHD compares sequences element-wise based on a substitution matrix. Substitution costs are not fixed by the researcher, but based on transition rates for each time point separately (Lesnard, 2010; see Figure 1AA in the Appendix A). By taking into account the timing of transitions, DHD differs crucially to the widely used Optimal Matching technique (OM), which allows for insertion and deletion operations which shifts substantially the timing and keep the substitution costs fixed. As "costs" can vary over time, e.g. the transition rate from being a student to entering full-time employment might be different if we compare these transitions at ages 16, 18 and 22 for example; and they should not be assigned as equal. After applying DHD, we obtain estimates of dissimilarities between individual educational and employment sequences.

Dissimilarity estimates produced from the sequence analysis are the key input data for the cluster analysis. Individual sequences are grouped together based to produce the most common education and employment trajectories among young people. For the cluster analysis, we use the partitioning around medoids algorithm (*k-medoids*). The *K-medoid* method is more robust towards outliers compared to *k-means* method as it minimises the sum of dissimilarities as opposed to the sum of squared interval-scaled distances (Kaufmann & Rousseeuw 2005). It selects *k* representative medoids to split the data into *k* final clusters. A medoid is an object of the cluster for which the average dissimilarity to all other objects in the cluster is minimal.

There exists no unique solution in defining the number of clusters. We followed a three-stage approach. First, we analysed dendrograms produced from applying Ward's hierarchical clustering algorithm to identify natural breaks in the data. Second, we computed the Studer et al. (2011) discrepancy measures of a set of sequences – pseudo F and pseudo $R^2$ to compare the goodness of cluster solutions (table 1AA in the Appendix A). Based on the distance, size and discrepancy parameters of cluster solutions, six and seven cluster solutions were chosen as the number of split for the *k-medoids* algorithm. We explored partitioning into eight clusters which was determined to lead to the emergence of small cluster sizes and regarded as unsuitable for analysis. Third, we compared the silhouettes of six and seven cluster solutions. The six cluster solution seemed to produce more distinct clusters with higher silhouette width parameters (see Table 2AA in the Appendix A). Six representative school-to-work trajectories were thus defined.

### 3.2.2 Multinomial logistic regression

After applying sequence and cluster analyses, we use the multinomial logistic regression for two purposes. First, we investigate how individual characteristics (cohort, gender, parental SES, and region of residence) are related to the probability of following a particular school-to-work pathway, where the pathways are used as an outcome variable. Next, we analyse the link between the individual characteristics and experienced education and employment trajectories and the occupational outcomes at age 26 (outcomes are used as dependent variable). The model can be formalised as followed:

$$ln\frac{\Pr(y = m \mid \mathrm{x})}{\Pr(y = b \mid \mathrm{x})} = \mathrm{x}\beta_{m \mid b} \qquad for\ m = 1\ to\ J$$

where *b* is the base category or reference group. *J* stands for the number of possible outcomes. Solving this equation for each *m*, the predicted probabilities of an individual *x* falling into group (outcome) *m* can be calculated as followed:

$$\Pr(y = m \mid \mathrm{x}) = \frac{\exp(\mathrm{x}\beta_{m \mid b})}{\sum_{j=1}^{J} \exp(\mathrm{x}\beta_{j \mid b})}$$

Where $\sum_m \Pr(y = m) = 1$.

In the first set of models, *J* represents six education and employment clusters resulting from sequence analysis ("Rapid School-to-Work"; "Part-time employed"; "Non-Active";

"Unemployed"; "Higher education to Work"; "Prolonged Studies" as explained in section 4.1)

In the second set of models, *J* stands for five categories of occupational outcomes at age 26. To identify own occupational achievements we applied the Registrar-General Social Classification, which was consistently used both in BHPS and UKHLS. The outcomes were grouped into three categories: "Professional & Managerial"; "Skilled non-manual"; "Skilled manual & Unskilled" (which also included partly skilled and those in armed forces). Being "Non-Active" or "Unemployed" contribute to the fourth and fifth occupational outcomes in the model.

## 3.3 Variables

Cohort, gender, and parental socio-economic background are our main covariates. We compare education and employment careers of young men and women born in 1974–79, 1980–84, and 1985–90. We model them together with cohort and gender used as dummy variables. Educational level is measured as: (1) low (compulsory school education, GCSE or equivalent); (2) medium ("A-levels" or equivalent); and (3) high ("1st Degree" or any other higher degree).[2] To measure the parental socio-economic background we used data on occupational class coded using the Goldthorpe social class schema. The schema distinguishes between service class (mostly professional & managerial occupations), intermediate class (routine non-manual occupations, small proprietors, technicians), and working class (skilled manual, semi- and unskilled occupations) (Goldthorpe, 1983; Goldthorpe et al., 1980). If the occupational class of the mother and the father was different, we used father's occupational status.

We additionally controlled for region of residence, distinguishing between "London and the South East", and the rest of England and Wales. London and the South East of England are traditionally considered to be a human-capital "escalator" region due to the variety of available jobs and education opportunities as well as faster career progression (Fielding, 1992; Faggian & McCann, 2009).

[2] Information about the highest qualification was harmonised by the Understanding Society Support Team and accounts for the relevant level of received vocational training.

# 4 Results

We present the results in two parts. We analyse school-to-work trajectories between ages 16 and 26 (section 3.4.1) and examine the way they influence occupational outcomes in early working life (i.e. age 26; section 3.4.2).

## 4.1 Education and employment career sequences

### 4.1.1 Defining school-to-work pathways

The results of the analysis of education and employment trajectories among young people are structured as following. First, we discuss the descriptive findings regarding the complexity and changes in time spent in various economic activity spells by cohort and gender. Next, we present the results of sequence and cluster analysis applications and describe the distinguishing features of each of the six final clusters (the mean time spent in various employment states, size and medoid of each cluster). We analyse how the distribution by clusters differ by cohort, gender, parental SES, and region of residence at age 16. We then describe how individual characteristics are related to the probability of following a particular school-to-work pathway.

Table 1 reports the mean time spent in each of the five labour market states (in months) and the median number of states across various labour market activity statuses by cohort and gender. The mean number of months spent in full-time employment between age 16 and 26 has declined considerably over time. Earlier cohorts (i.e. 1974-79 and 1980-84) spent over 50 months in full-time employment, while cohort born 1985-90 were in full-time work for an average of 42 months and significantly more time in education and part-time employment. This can be attributed to the continuous expansion of further and higher education.

The maximum number of changes in labour market states experienced by a person in the sample was 10, both for males and females.[3] The median number of spells was consistently increasing among all cohorts with the youngest cohort experiencing less structured transitions than the older two cohorts. The increase in Shannon's entropy measure of sequence complexity confirms this finding (see Table 2). This evidence suggests that pathways have become more chaotic among the youngest cohorts and might be a reflection of the changing labour market and difficulties to find a job.

[3] In this paper we do not account for the change of employers if someone has changed jobs but remained employed.

Women persistently spend less time in full-time employment and more time in part-time work or being inactive, compared to men across the three cohorts. The median number of spells is higher among women in all cohorts suggesting that women experience more turbulent employment and education trajectories (Table 1).

**Table 1. Mean time (in months) spent in each state and median number of states by cohort and gender**

| Cohort | Labour market activity status | | | | | Median number of states |
|---|---|---|---|---|---|---|
| | Full-time Employed | Part-time Employed | Student | Unem-ployed | Non-active | |
| **1974-79** | 54 | 8 | 38 | 9 | 10 | 3.3 |
| Males | 61 | 5 | 38 | 11 | 5 | 3.1 |
| Females | 48 | 11 | 38 | 8 | 16 | 3.5 |
| **1980-84** | 51 | 8 | 41 | 9 | 11 | 3.4 |
| Males | 59 | 4 | 39 | 12 | 5 | 3.3 |
| Females | 42 | 12 | 43 | 7 | 16 | 3.5 |
| **1985-90** | 42 | 14 | 43 | 10 | 12 | 3.9 |
| Males | 50 | 11 | 44 | 12 | 3 | 3.5 |
| Females | 37 | 16 | 41 | 9 | 17 | 4.1 |

*Note*: Months are rounded to the nearest whole number.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 2. Shannon's entropy measure for sequences by gender and cohort**

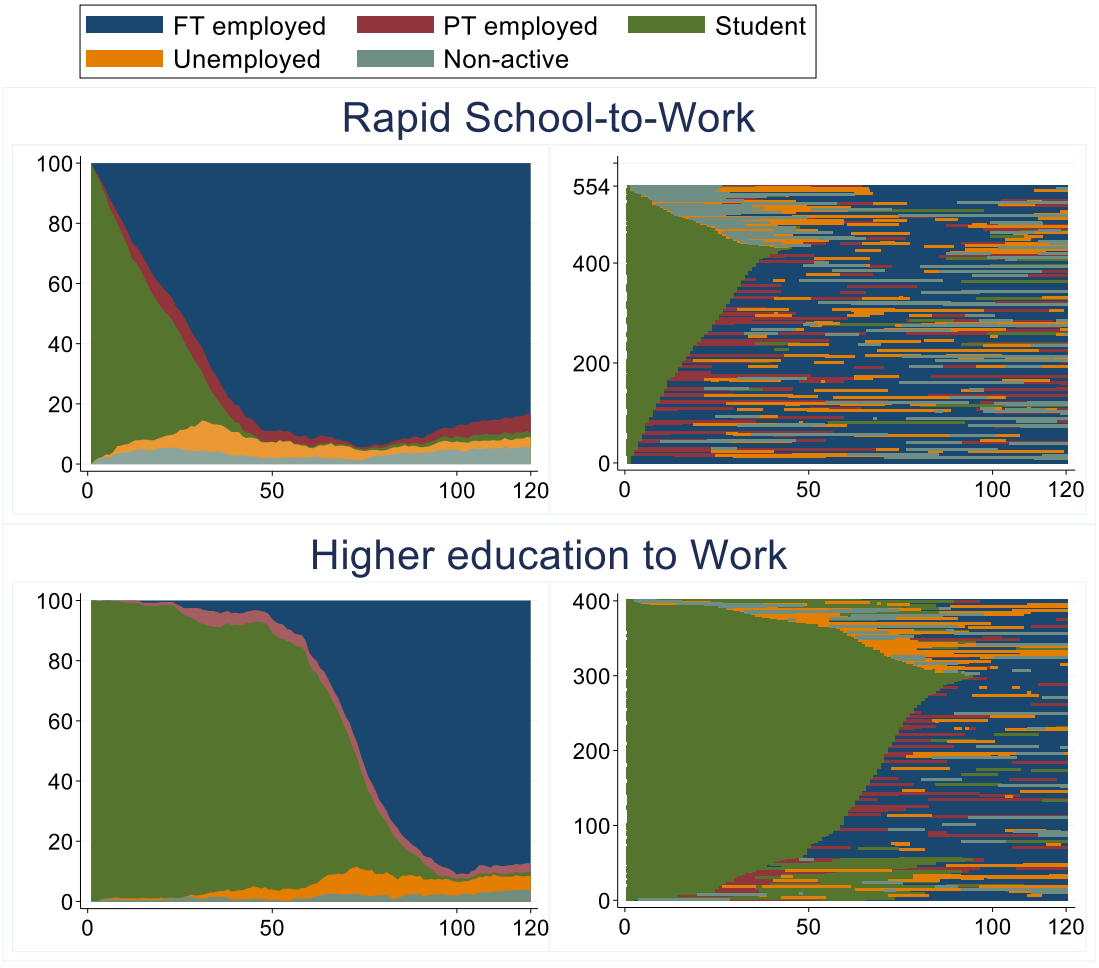
| Gender | Cohort | | |
|---|---|---|---|
| | 1974-79 | 1980-84 | 1985-90 |
| **Males** | | | |
| Entropy measure | 0.974 | 0.977 | 0.999 |
| Entropy measure 2 | 0.029 | 0.031 | 0.034 |
| **Females** | | | |
| Entropy measure | 1.130 | 1.137 | 1.213 |
| Entropy measure 2 | 0.036 | 0.037 | 0.046 |
| **Total** | | | |
| Entropy measure | 1.050 | 1.058 | 1.123 |
| Entropy measure 2 | 0.033 | 0.034 | 0.041 |

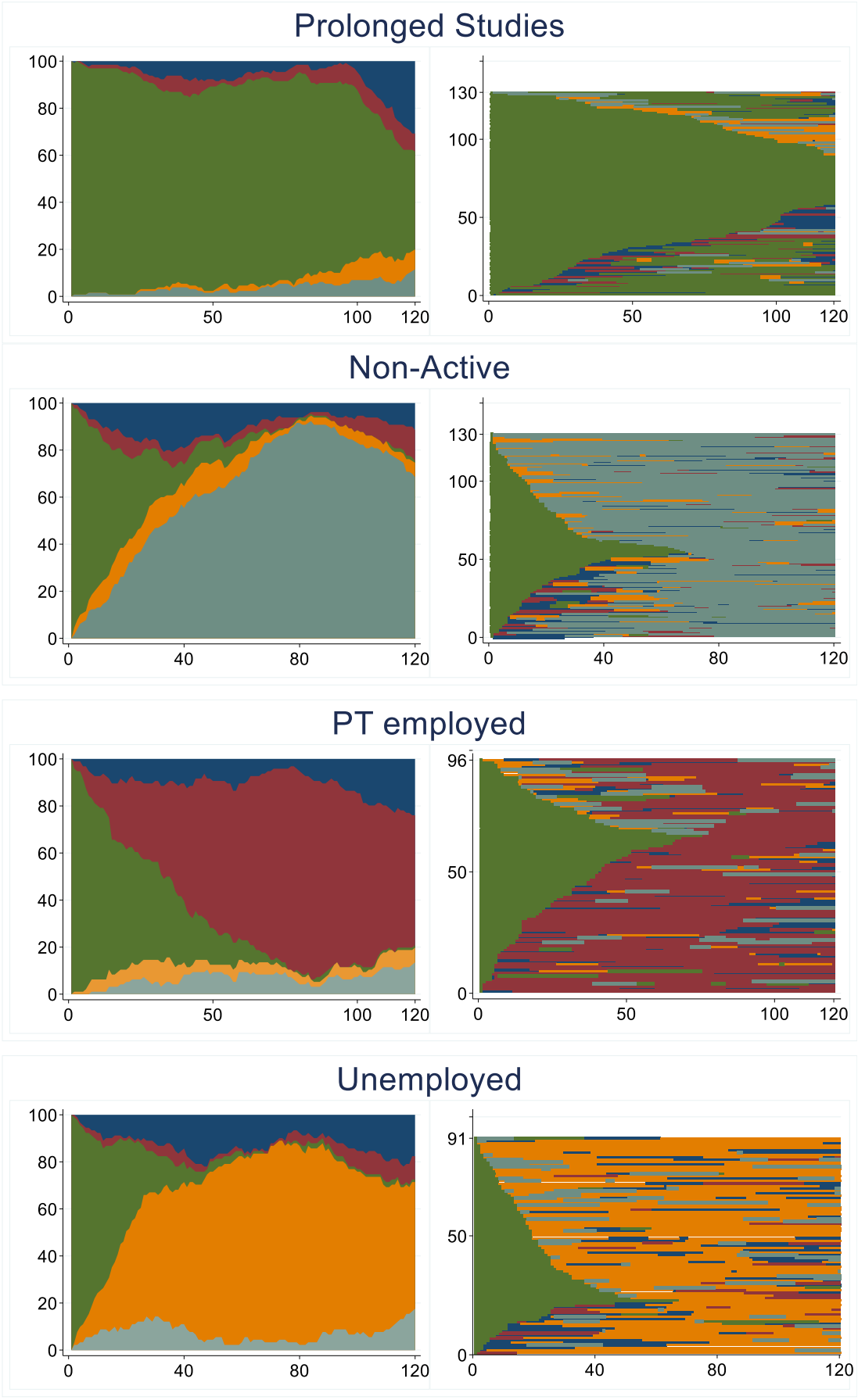
*Note*: Shannon's entropy (or "complexity") measure is based on relative duration spent in the different states. Entropy measure 2 takes into account the number of spells and the sequence length.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

Figure 1 presents pairwise chronogram and indexplots for the representative sequences identified through the sequence and cluster analysis. Chronograms on the left side show

the distribution of individuals across education states by month scale. Index plots on the right side represent individual sequences over time. Each horizontal line represents an individual trajectory and different colour denotes each activity status. All individuals start at age 16 being enrolled in full-time education (still at school; green colour). The graphs should be read from left to the right. Index plots point out that many young adults, even in clusters where full-time employment is prevalent, do also experience spells of unemployment, part-time employment, and non-activity.

**Figure 1. Combined chronogram and indexplots for education and employment pathways**






*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

Six distinctive educational and employment pathways were identified as: “Rapid School-to-Work”; “Higher education to Work”; “Prolonged Studies”; “Non-Active”; “Part-time employed”; and “Unemployed”. Table 3 provides a summary of the number of months spent in each state by cluster together with the cluster size and medoids. The medoid is the young person in the cluster for whom the average dissimilarity of education and employment trajectory to all other objects in the cluster is minimal.

Overall, the “Rapid School-to-Work” transitions contribute almost 40% of all cases, suggesting that the accelerated British pattern of entering the labour market straight after school still dominates among young people. This pathway is characterised by little amount of time spent in education after age 16, with about 75% of time spent in full-time employment. Around 1/3 of young people opt for higher education prior to entering the labour market and refer to the second biggest cluster – “Higher education to Work”. This trajectory denotes individuals who spent around 5.5 years in education after the age of 16 and almost 4 years being employed. The third pathway describes a pattern of “Prolonged Studies” where on average 8 years is spent in education and 1 year being employed. 9% of young people in the sample are staying in education for a prolonged period of time. Around 1/5 of young people experience more turbulent and less structured transitions with longer spells of being non-active, unemployed or part-time employed. The “Non-Active” pathway refer to the cluster where individuals have spent around 6 years out of 10 being non-active with short spells of being employed. The “Part-time employed” pathways is defined by the prolonged time spent being part-time employed (~50% of time) with approximately 2.5 years spent in education and 1 year being full-time employed. The modal plot in the Appendix A (Figure 2AA) provides a visual illustration of an artificial sequence composed by the most frequent state at each month after age 16 for each of the above clusters. Table 3AA in the Appendix A additionally shows that the mean number of states in most of the clusters (with an exception of “Part-time employed” and “Non-active”) has been continuously increasing confirming that transitions among younger cohort have become more turbulent.

**Table 3. Mean time spent in each state by cluster (in months) with size and medoid of each cluster**

| Pathways | FT Emp. | PT Emp. | Stu-dent | Un-emp. | Non-active | Size | % | Medoid |
|---|---|---|---|---|---|---|---|---|
| Rapid School-to-Work | 88 | 5 | 19 | 5 | 4 | 554 | 40 | 20 S - 100 FT |
| Higher education to Work | 45 | 4 | 65 | 5 | 2 | 400 | 29 | 71 S - 49 FT |
| Prolonged studies | 8 | 6 | 98 | 4 | 5 | 130 | 9 | 120 S |
| Non-Active | 12 | 6 | 20 | 8 | 74 | 130 | 9 | 20 S- 100 NA |
| Part-time employed | 13 | 67 | 27 | 6 | 8 | 96 | 7 | 31 S - 89 PT |
| Unemployed | 16 | 5 | 19 | 72 | 9 | 91 | 6 | 19 S - 101 U |

*Note*: Months are rounded to the nearest whole number. "S" stands for being a student; "N-A" for being non-active; "PT" for being part-time employed; "FT" for being full-time employed; "U" for being unemployed.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

### 4.1.2 Personal background characteristics by pathways

Next, we investigated how the defined sequences are linked to the personal background characteristics to see whether any variation is observed by cohort, gender, and parental SES. Table 4 shows the distribution of educational and employment pathways across key individual background characteristics. It reveals key changes in the pathways undertaken by young people over time. The most pronounced changes are the significant decrease in the proportion of "Rapid School-to-Work" trajectories, and mirroring increase in "Part-time employment" and "Prolonged studies" for the youngest cohort.

**Table 4. Background characteristics of education and employment pathways, % in rows**

| | Rapid School-to-Work | Higher education to Work | Prolonged studies | Non-Active | Part-time employed | Unemployed | Total number of people (100%) |
|---|---|---|---|---|---|---|---|
| **Cohort** | | | | | | | |
| 1974-79 | 43 | 29 | 8 | 9 | 6 | 6 | 721 |
| 1980-84 | 39 | 28 | 10 | 9 | 6 | 8 | 451 |
| 1985-90 | 31 | 29 | 12 | 10 | 12 | 6 | 229 |
| **Gender** | | | | | | | |
| Male | 47 | 28 | 9 | 3 | 4 | 8 | 687 |
| Female | 32 | 29 | 10 | 15 | 9 | 5 | 714 |
| **Parental SES** | | | | | | | |
| Service class | 33 | 41 | 12 | 5 | 6 | 3 | 534 |
| Intermediate class | 45 | 23 | 8 | 9 | 8 | 7 | 379 |
| Working class | 49 | 18 | 6 | 13 | 6 | 7 | 366 |
| Missing* | 23 | 20 | 11 | 18 | 10 | 19 | 122 |
| **Region of residence at age 16** | | | | | | | |
| Rest of E &W | 38 | 29 | 9 | 11 | 7 | 7 | 1,066 |
| London & SE | 44 | 28 | 11 | 5 | 7 | 4 | 335 |
| **Total** | 40 | 29 | 9 | 9 | 7 | 6 | 1,401 |

*Note*: * - The category "missing" refer to young people whose parents were unemployed, non-active or had missing values in the occupation question.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

Pronounced gender differences by pathways have been observed as well. Almost half of men and 1/3 of women in the sample fall into "Rapid School-to-Work" trajectory with equal proportions of men and women (37% and 39% correspondingly) opting for higher education after school. Among men and women together, women contribute to more than 80% of "Non-active" and 70% of "Part-time employment" clusters. To further investigate gender differences in the prevalence of these two clusters, we looked at the distribution of men and women by clusters depending on their educational level at age 26 (Table 4AA in the Appendix A). Low educated women contributed to around 80% of all women in "Non-active" cluster and up to 60% of all women in "Part-time employment" cluster. Similar tendency was seen among men, although the numbers are too small to draw firm conclusions. Both trajectories are more common among those with low educational level.

As expected, considerable differences in the distribution of trajectories are found with regards to the parental socio-economic background. Almost half of young people from less advantaged backgrounds fall into "Rapid School-to-Work" trajectories as opposed to 1/3 from most advantaged backgrounds. Half of young people from the most advantaged

background transition into higher or further education after school, compared to almost a third and a quarter of young people from intermediate and social class backgrounds. The highest proportion of young people in the "Prolonged studies" cluster comes from the service class. Young people from the working class contribute to the highest proportion of "Non-active" cluster.

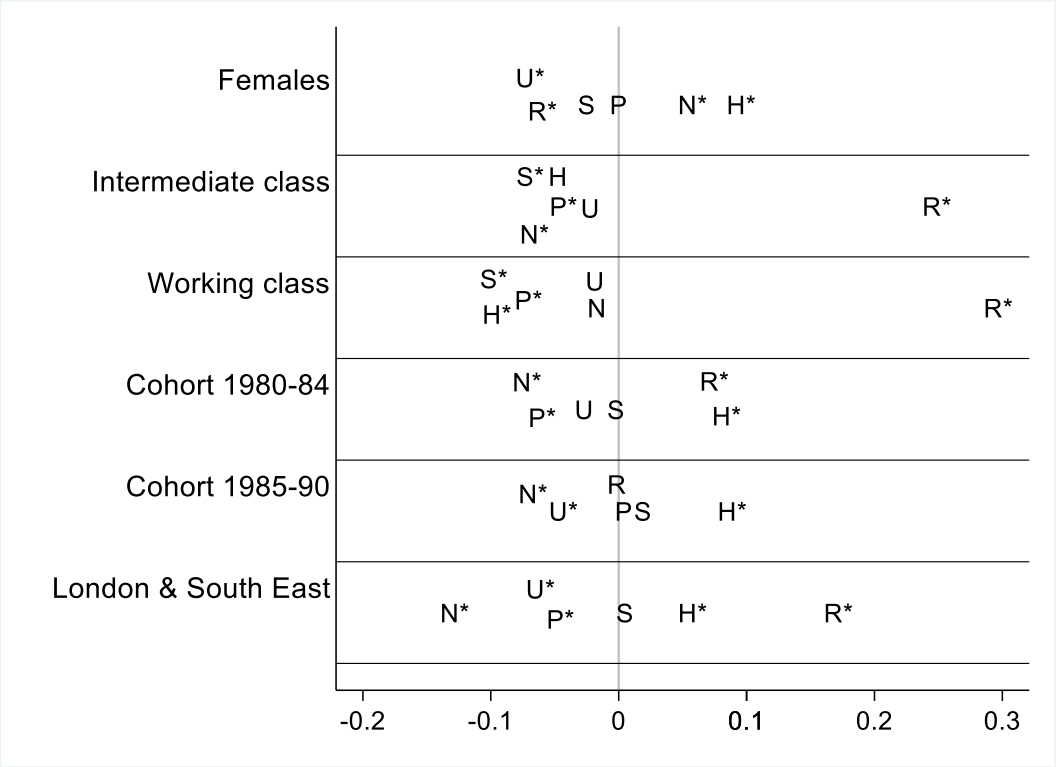
The distribution of clusters by the region of residence at age 16 shows a similar prevalence of "Rapid School-to-Work" and "Higher education to Work" trajectories both among those living in London and the South East of England as well as elsewhere. The differences are observed in the lower proportion of young people following "Non-Active" and "Unemployed" trajectories, pointing to the larger availability of jobs in the "escalator" region.

We additionally looked at the distribution of clusters by educational attainment in the end of the observation period (results not shown). As expected, the majority of highly educated people (79%) have followed the "Higher education to Work" or "Prolonged studies" pathways, while a few (12%) obtained qualification while experiencing a "Rapid School-to-Work" trajectory. Though, the latter was more common among medium and low educated individuals, with half of people in these groups making a "Rapid School-to-Work" transition. Low educated individuals tend to largely engaged in "Non-active" and "Unemployed" pathways.

#### 4.1.3 Probability of following school-to-work pathways

Next, we analysed how background characteristics (cohort, gender, parental SES and region of residence at age 16) relate to the probability of belonging to a certain education and employment pathway. Following McVicar and Anyadike-Danes (2002), we used our six education and employment clusters as outcome variable in a multinomial logistic regression analysis, with "Rapid School-to-Work" cluster chosen as a reference category (predicted probabilities of clusters are presented in Table 5AA in the Appendix A). Based on our multinomial logistic regression estimates, Figure 2 presents the marginal effects of covariates on the probability of transitioning through a given pathways (a full table with the results of multinomial logistic regression models is reported in the Appendix A, Table 6AA).

**Figure 2. Marginal effects on six pathways outcomes probabilities estimated from multinomial logit models**




*Note*: "R" refers to "Rapid School-to-Work" cluster; "N" to "Non-active"; "P" to "Part-time employed"; "U" to "Unemployed" , "H" to "Higher education to Work"; "S" to "Prolonged studies". Males, young people from service background, young people born in 1974-79, and those not living in London and the South East at age 16 are chosen as reference categories.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

Individuals from cohorts 1980-84 and 1985-90 were more likely to continue education after school and were surprisingly less likely to follow the "Non-active" pathway. According to our model estimations, females are much less likely to follow "Rapid School-to-Work" and "Unemployment" pathways, but are significantly more likely to follow "Non-active" and "Higher education to Work" pathways, which confirm the descriptive findings. Socio-economic background is also a significant factor for predicting education and employment pathways. Young people from less advantaged backgrounds were much more likely to follow the Rapid School-to-Work transitions and less likely to experience the prolonged education pathway as compared to the most advantaged group. Young people from lower socio-economic backgrounds were also less likely to experience longer spells of part-time employment. With regards to geography, young people living in London and South East at age 16 were significantly more likely to either follow the Rapid School-to-Work trajectories or opt for university degree. They were also significantly less likely to follow more turbulent

pathways of non-activity, part-time employment and unemployment, confirming the relevance of labour market conditions in defining young people's choices and future career prospects.

## 4.2 Occupational outcomes at age 26

Collectively, personal background characteristics, and education and employment pathways are key in shaping labour market outcomes in the transition to the workforce. We explore the influence of these factors on occupational outcomes ten years after completion of compulsory education, employing a series of multinomial logistic models. Our dependent variable comprises five potential outcomes: Professional and managerial occupation, skilled non-manual occupation; skilled manual and unskilled occupation; non-active, and unemployed. These outcomes at measured at age 26. Given small numbers, those remaining in education at this age are considered to be non-active, comprising around 1/3 of this group.

The results are reported in the following order: First, we investigate the effects of education and employment pathways on occupational outcomes including the six representative trajectories identified above as dummy covariates in our model. The "Rapid School-to-Work" pathway is used as reference category. Next, we analyse the influence of personal background characteristics (cohort, gender, parental SES) and how interactions between these characteristics and education play out. We additionally control for the effects of the "escalator" region and distinguish between those who moved to or lived in London and the South East of England and those who moved to or lived in the rest of England and Wales.

Table 5 presents the marginal effects of covariates on occupational outcomes probabilities estimated from multinomial logistic models. The predicted probability of being in skilled manual or unskilled occupation is the highest (0.27), following the skilled non-manual and professional occupations (0.23 and 0.21, accordingly, see Table 7AA in the Appendix A). Table 8AA in the Appendix A presents the distribution of covariates by occupational outcomes.

**Table 5. Marginal effects on occupational outcomes at age 26 probabilities estimated from multinomial logit models**

| Variables | Prof & Manag | Skilled Non-Manual | Skilled manual / Unskil | Non-Active | Unem-ployed |
|---|---|---|---|---|---|
| **Cohort (1974-79 - Ref.)** | | | | | |
| 1980-84 | 0.027 | 0.027 | -0.023 | -0.023 | -0.008 |
| | (0.022) | (0.024) | (0.024) | (0.021) | (0.015) |
| 1985-90 | -0.006 | -0.046 | 0.025 | 0.015 | 0.011 |
| | (0.028) | (0.032) | (0.030) | (0.025) | (0.019) |
| **Gender (Males - Ref.)** | | | | | |
| Females | ***0.045*** | ***0.123*** | ***-0.140*** | 0.011 | ***-0.038*** |
| | (0.019) | (0.020) | (0.020) | (0.018) | (0.014) |
| **Parental SES (Service class - Ref.)** | | | | | |
| Intermediate class | -0.029 | 0.015 | 0.035 | 0.001 | -0.022 |
| | (0.024) | (0.026) | (0.026) | (0.023) | (0.018) |
| Working class | ***-0.052*** | -0.041 | ***0.104*** | -0.005 | -0.006 |
| | (0.026) | (0.028) | (0.026) | (0.024) | (0.018) |
| Missing | ***-0.106*** | 0.016 | 0.050 | -0.019 | ***0.060*** |
| | (0.046) | (0.045) | (0.043) | (0.035) | (0.020) |
| **Educational level at age 26 (High - Ref.)** | | | | | |
| Medium | ***-0.080*** | 0.038 | ***0.181*** | -0.031 | ***-0.107*** |
| | (0.021) | (0.024) | (0.026) | (0.022) | (0.021) |
| Low | ***-0.143*** | 0.006 | ***0.221*** | -0.035 | ***-0.049*** |
| | (0.024) | (0.026) | (0.026) | (0.022) | (0.015) |
| **Education and Employment Pathways (Rapid School-to-Work -Ref.)** | | | | | |
| Higher education to Work | ***0.151*** | ***0.058*** | ***-0.090*** | ***-0.096*** | -0.022 |
| | (0.020) | (0.023) | (0.025) | (0.026) | (0.016) |
| Prolonged studies | ***0.120*** | ***-0.155*** | ***-0.246*** | ***0.259*** | 0.022 |
| | (0.036) | (0.053) | (0.055) | (0.025) | (0.023) |
| Non-Active | -0.019 | ***-0.169*** | ***-0.144*** | ***0.313*** | 0.020 |
| | (0.057) | (0.059) | (0.048) | (0.025) | (0.026) |
| Part-time employed | ***0.101*** | -0.049 | -0.067 | 0.025 | -0.010 |
| | (0.038) | (0.042) | (0.040) | (0.036) | (0.030) |
| Unemployed | 0.006 | ***-0.233*** | -0.078 | ***0.126*** | ***0.178*** |
| | (0.076) | (0.088) | (0.053) | (0.039) | (0.018) |
| **Migration between ages 16 and 26 (Stayed outside London and SE - Ref.)** | | | | | |
| Moved to London & SE | ***0.103*** | 0.040 | -0.014 | -0.032 | -0.097 |
| | (0.042) | (0.055) | (0.070) | (0.057) | (0.068) |
| Stayed in London & SE | 0.035 | 0.013 | 0.036 | ***-0.068*** | -0.017 |
| | (0.024) | (0.026) | (0.026) | (0.025) | (0.018) |
| Moved out from London & SE | 0.038 | 0.017 | -0.025 | -0.006 | -0.024 |
| | (0.047) | (0.053) | (0.057) | (0.048) | (0.042) |

*Note*: Estimates in italics and bold denote statistical significance at the 5% level. Standard errors are reported in parentheses.

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

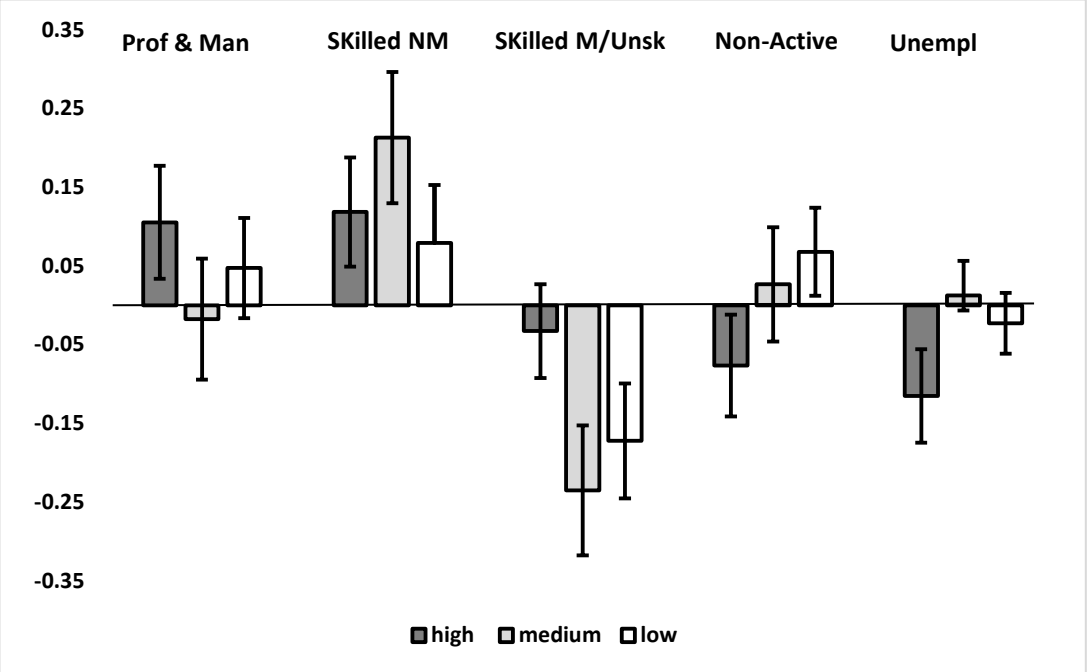
Education and employment trajectories comprise a significant predictor of occupational outcomes. Those who have opted for higher education (clusters “Higher education to Work” and “Prolonged studies”) have significantly higher chances of being in professional and managerial positions and less chance of being in skilled manual or unskilled occupations. Transitioning through a part-time employment pathway also leads to higher chances of being in a professional and managerial occupation. Although, evidence was found that part-time employment can lead to occupational downgrading (e.g. Connolly & Gregory, 2008), we suggest our findings show that being employed on a part-time job enables to accumulate working experience which is increasingly valued in the labour market and seems to be essential for high-skilled occupations.

Following the “Non-active” and “Unemployment” trajectories significantly reduce the chances to be employed and increases the chances of staying out of the labour market at age 26 compared to the “Rapid School-to-Work” trajectory. This finding suggests that longer spells of non-activity and unemployment reduce the chances of being successfully integrated into the labour market and thus have a scarring effect on future employment trajectories which might lead to persistent disadvantage in later life.

Our main model estimations display a statistically insignificant coefficient for our cohort variables suggesting that individual background characteristics and school-to-work pathways are more influential on shaping occupational outcomes in early working life. We additionally checked the interaction effect between the cohort and educational level, returning insignificant coefficients (Table 9AA in the Appendix A).

Women are more likely to be in professional and skilled non-manual occupations, but less likely to be in skilled manual occupations or unemployed. Regardless of the educational level, women are more likely to be in skilled non-manual occupations and less likely to be in skilled manual occupations (Figure 5; Table 10AA in the Appendix A). Highly educated women have higher chances of being in professional and managerial positions and are less likely to be non-active or unemployed than highly educated men. These findings are confirmed by additional regression estimates from a model including only highly educated individuals (Table 12AA in the Appendix A), suggesting that highly educated women do have better employment chances than men. Low educated women, on the contrary, have a much higher chance to be non-active and thus excluded from the labour market.

**Figure 5. Marginal effects of education on pathways outcomes probabilities for men and women**

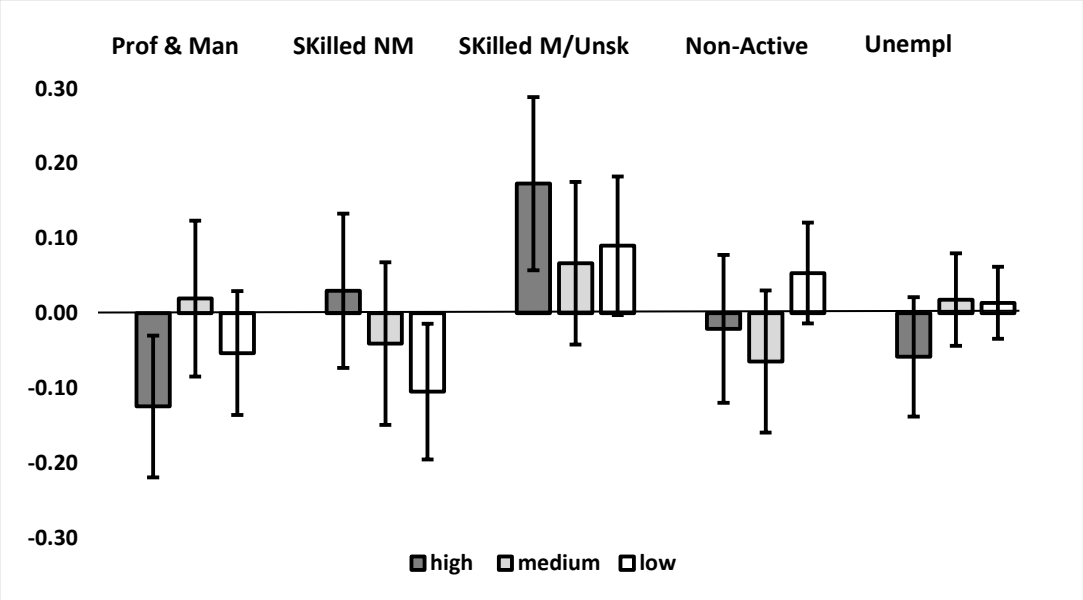



*Note*: Figures represent the marginal effects for women compared to men. Men are the reference category.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

The results also reveal that young people from working class backgrounds experience lower chances of being in professional and managerial positions and higher chances of being in skilled manual or unskilled occupations. Since the expansion of higher education have prompted increased participation rates of young people from less advantaged background among the youngest cohorts, the question arises whether obtaining a degree influences labour market outcomes differently for various socio-economic groups. To this end, we include an interaction term between education and socio-economic background in the model (Table 12AA in the Appendix A). Figure 6 shows the marginal effects of education on occupational outcomes probabilities among young people from a working class background compared to service class. The results for the intermediate class were not significant (Table 12AA in the Appendix A). Highly educated young people from a working class background experience lower probability of being in professional and management occupation and higher probability of being in skilled manual occupations compared to highly educated young people from more advantaged backgrounds. The latter suggests that despite having a degree young people from the working class are still in less favourable position than highly educated young people from more advantaged backgrounds. Additionally, we run

the model on occupational outcomes including only highly educated individuals (Table 11AA in the Appendix A). The results confirm lower chances of highly educated young people from working class backgrounds to achieve the same level of labour market success as their counterparts from more advantaged backgrounds.

**Figure 6. Marginal effects of education on occupational outcomes probabilities among young people from a working class background**




*Note*: Figures represent the marginal effects for the working class compared to service class. Service class is the reference category.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

We additionally controlled for the migration pattern between age 16 and 26. The results confirmed the "escalator" effects of London and South East suggesting that residents and in-migrants experience higher chances of being in professional and managerial occupations and lower chances of being non-active.

## 5 Discussion

In this paper we analysed 10-year school-to-work trajectories and labour market outcomes among young people born in the late 1970s and 1980s. A core aim of our research was to assess changes and continuities in the traditional British pattern of the transition to adulthood characterised by a rapid entry into the working life. We show that trajectories have become more complex and diverse, with longer time spent in education or vocational training observed among the youngest cohorts. Still, almost a half of men and third of

women are following the traditional British pattern of rapid school-to-work transitions. Our analysis shows that occupational outcomes 10 years after school are linked to the individual education and employment trajectories, but the magnitude of these effects is altered by gender and parental socio-economic background. Despite an overall positive association between entering higher education and securing a job which is high in the occupational hierarchy, highly educated young people from working class families have significantly lower chances of being in professional and managerial occupations after graduation. We also find further evidence for the persistence of patterns of disadvantage over time. Thus, low-educated young people as well as those from lower socio-economic backgrounds are more likely to be engaged in low skill occupations or experience longer spells of unemployment and non-activity. Longer time spent in unemployment or non-activity lead to higher chances of staying unemployed or non-active and might have a continuous scarring effect in later life. Low-educated women, in particular, were found to be highly likely excluded from the labour market for the longer periods.

Despite the fact that accelerated pathways from school to work have remained the most prevalent among young adults aged 16 to 26 over the last 25 years, the pathways themselves have changed. We have observed the continuous decrease in the mean time spent in full-time employment and an increase in part-time employment and time spent in education among the youngest cohorts. The shift towards part-time employment might, on the one hand, mirror an increase in flexible working arrangements for those who seek them, but on the other hand, it may mask the lack of opportunities to find a full-time job. The continuous expansion of higher and further education has resulted in a steady increase in the proportion of young people continuing education after school. Although, despite the prolonged stay in education, the proportion of highly educated individuals in each cohort by age 26 increased very little. This finding poses further question whether time spent in education without an increase in qualifications can be seen as a way to avoid unemployment or non-activity. And yet, many young adults across all cohorts experience spells of unemployment, part-time employment, and non-activity even in clusters where full-time employment and education are prevalent, suggesting that periods of temporary uncertainty has become an integral part of school-to-work trajectories.

Education and employment transitions are still highly defined by gender. Women on average spent less time being full-time employed and more time being part-time employment or being non-active. Almost half of men and less and 1/3 of women followed

the “Rapid School-to-Work pathway”. No differences were observed in the sharers of men and women who continue education after school. As expected, gender differences were observed in the occupational outcomes at age 26. Whilst highly educated women exhibit higher chances of being in professional and managerial positions than highly educated men, low educated women are at high risk of either working part-time or being completely excluded from the labour market.

Pronounced differences were observed in school-to-work trajectories as well as in occupational outcomes with regards to the parental socio-economic background. “Rapid School-to-Work” pathways are mostly followed by young people from less advantaged backgrounds. More than a half of young people from the service class opts for continuing education after school, compared to less than a quarter from the working class. Although with the overall expansion of higher education and increased shares of individuals from working class backgrounds opting for university degree, our analysis confirms that this does not lead to equal opportunities on the labour market after graduation. Highly educated young people from less advantaged backgrounds experience lower chances of securing a job in professional and management occupations compared to their counterparts from more advantaged backgrounds. The fact that highly educated young people from less advantaged backgrounds are doing worse in the labour market than their counterparts from privileged backgrounds pose further question regarding the effects of unobserved characteristics such as cognitive and interpersonal skills and social networks on educational performance and future labour market achievements.

This paper provides a strong evidence of persistence in less favourable outcomes. While the increased uncertainty in the labour market results in the large proportion of young people experiencing at least one spell of unemployed or non-activity in early career, for some this period might result in long-term unstructured “patchwork careers”. Our analysis shows more disrupted and disadvantaged pathways of “Non-active” and “Unemployed” increase the chances of staying non-active or unemployed for longer period of time and pose a serious threat for young people’s future career progression. This finding confirms some of the earlier evidence found regarding the persistence of precarious employment conditions among less advantaged youth, e.g. the existence of the “low-pay, no-pay cycles” (Crawford et al., 2008; Schieldrick et al., 2010; Furlong et al., 2018). While having highest qualification does not guarantee full-time employment, we show that longer periods of

time spent unemployment or non-active are more prevalent among those without qualifications (as also shown e.g. by Burgess et al., 2003, Bell & Blanchflower, 2010).

A few directions for future research and policy implications must be discussed. Our analysis has shown how crucial the after school developments are for the future career and labour market outcomes in mid 20s. Future analysis could incorporate longer sequences and occupational mobility for the older cohorts as well as compare outcomes in long-term earning trajectories. This could improve our understanding of mechanisms of reproduction of social inequalities which stem from the education and employment trajectories in early adulthood and could further be used as evidence for planning effective policy intervention to help those in vulnerable positions not to fall into long-term disadvantaged positions.

Although, we confirm that highly educated women have higher chances of being in professional and managerial positions, there is strong evidence towards the existence of a gender pay gap in these occupations later in life (Blundell et al. 2010; Olsen et al., 2018). It is therefore important to further investigate how other life course events (e.g. career breaks and occupational downgrading after childbirth) might have a scarring effect on women's employment later in life. Considering the decrease in teenage pregnancies and overall postponement of starting a family, it remains unclear why low educated women are excluded from the labour market and suffer greater consequences than low educated men. This calls for a better understanding of female careers in general.

Extended periods of job insecurities and unemployment have shown to have negative consequences on young people's well-being and mental health and might lead to severe illnesses, depression and low self-esteem, which subsequently pose a threat towards future employability chances (Bell & Blanchflower, 2010; Sissons & Jones, 2012). On a macro level, youth unemployment, underemployment and non-activity have a large scarring effect on public finance. As the origins of the precarious educational and employment trajectories are multifold, it is clear that improving career advice services and continuing with the widening participation programmes could help creating a stimulating environment during the time of making career decisions in secondary school. A better communication between the employers and universities could contribute to the decrease in the skills mismatch and reduce in the numbers of young people forced to start jobs which require lower qualification than those they possess.

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# Appendix

**Table 1AA. Cluster-specific pseudo F and $R^2$ tests to determine the number of clusters**

| | Four clusters | Five clusters | Six clusters | Seven clusters | Eight clusters |
|---|---|---|---|---|---|
| Pseudo F | 125.56, p<0.001 | 112.57, p<0.001 | 102.18, p<0.001 | 93.59, p<0.001 | 86.99, p<0.001 |
| Pseudo $R^2$ | .30 | .34 | .37 | 0.39 | 0.41 |

*Note*: Pseudo F compares the sum of the squares explained by the cluster solution with the total sum by running 5,000 permutations of sequence reallocation based on the group membership vector (Studer et al., 2011). Pseudo $R^2$ shows the percent of total variability explained.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 2AA. Silhouette parameters for six-and seven-cluster solution**

| **Six cluster solution** | | | | |
|---|---|---|---|---|
| **Cluster** | **N of objects** | **Min width** | **Mean width** | **Max width** |
| 1 | 91 | -0.11 | 0.30 | 0.62 |
| 2 | 130 | -0.09 | 0.37 | 0.64 |
| 3 | 96 | -0.18 | 0.24 | 0.56 |
| 4 | 554 | -0.15 | 0.42 | 0.62 |
| 5 | 400 | -0.04 | 0.39 | 0.64 |
| 6 | 130 | -0.02 | 0.35 | 0.59 |
| **Seven cluster solution** | | | | |
| **Cluster** | **N of objects** | **Min width** | **Mean width** | **Max width** |
| 1 | 50 | -0.14 | 0.19 | 0.49 |
| 2 | 90 | -0.13 | 0.30 | 0.62 |
| 3 | 534 | -0.16 | 0.44 | 0.64 |
| 4 | 85 | -0.21 | 0.20 | 0.49 |
| 5 | 382 | -0.03 | 0.42 | 0.66 |
| 6 | 129 | -0.03 | 0.34 | 0.58 |
| 7 | 131 | -0.17 | 0.36 | 0.63 |

*Note*: Each cluster is represented by one silhouette, showing which objects lie well within the cluster and which objects hold an intermediate position. Silhouette width compares, for each case, the mean distance to other cases in the cluster, and the mean distance to the nearest neighbour cluster. Cases with the silhouette width closest to 1 are considered to be well classified, whereas cases with width closest to -1 are highly likely to be misplaced (Kaufmann & Rousseeuw, 2005).
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Figure 1AA. Transition matrix for dynamic hamming**

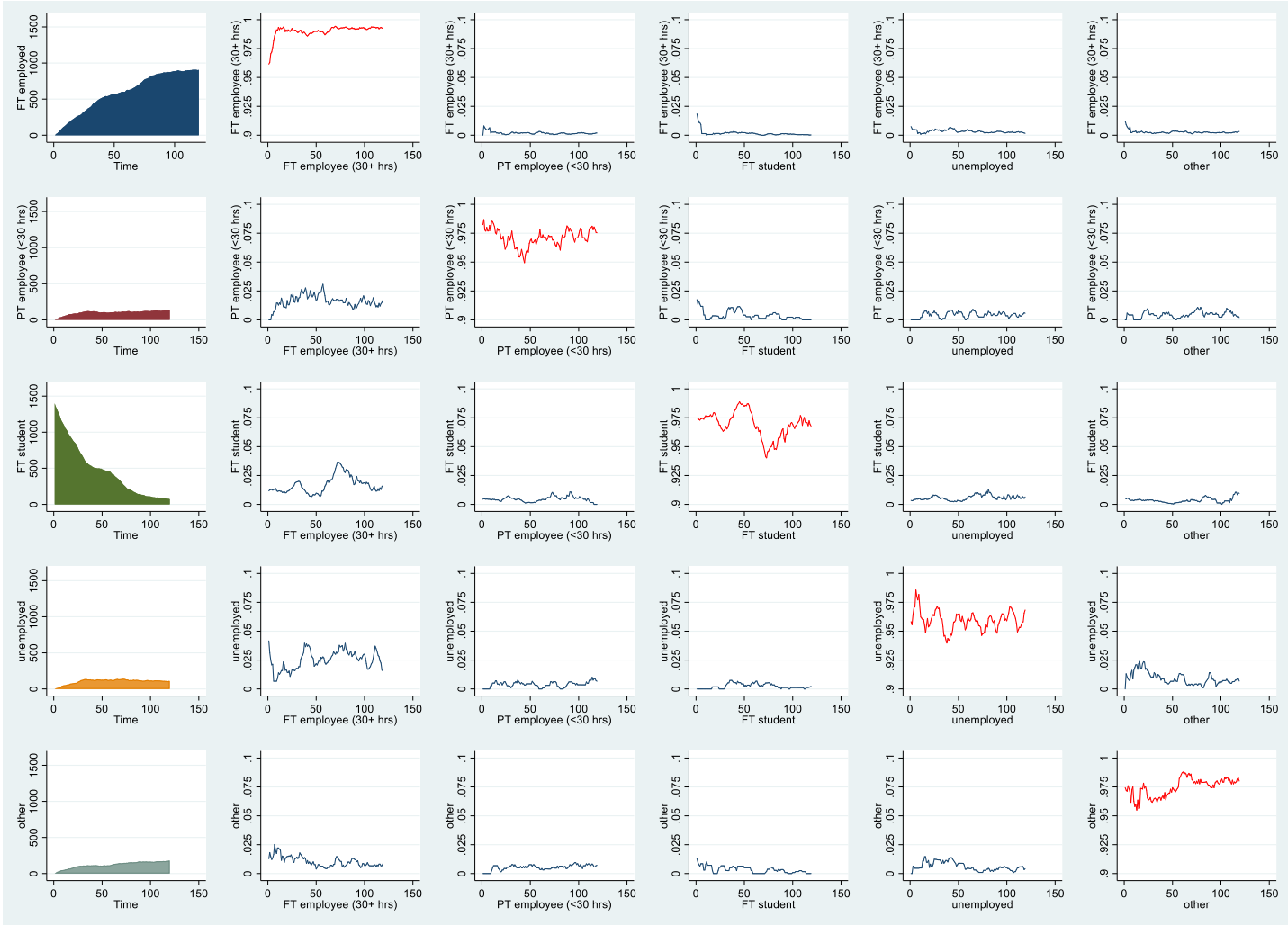
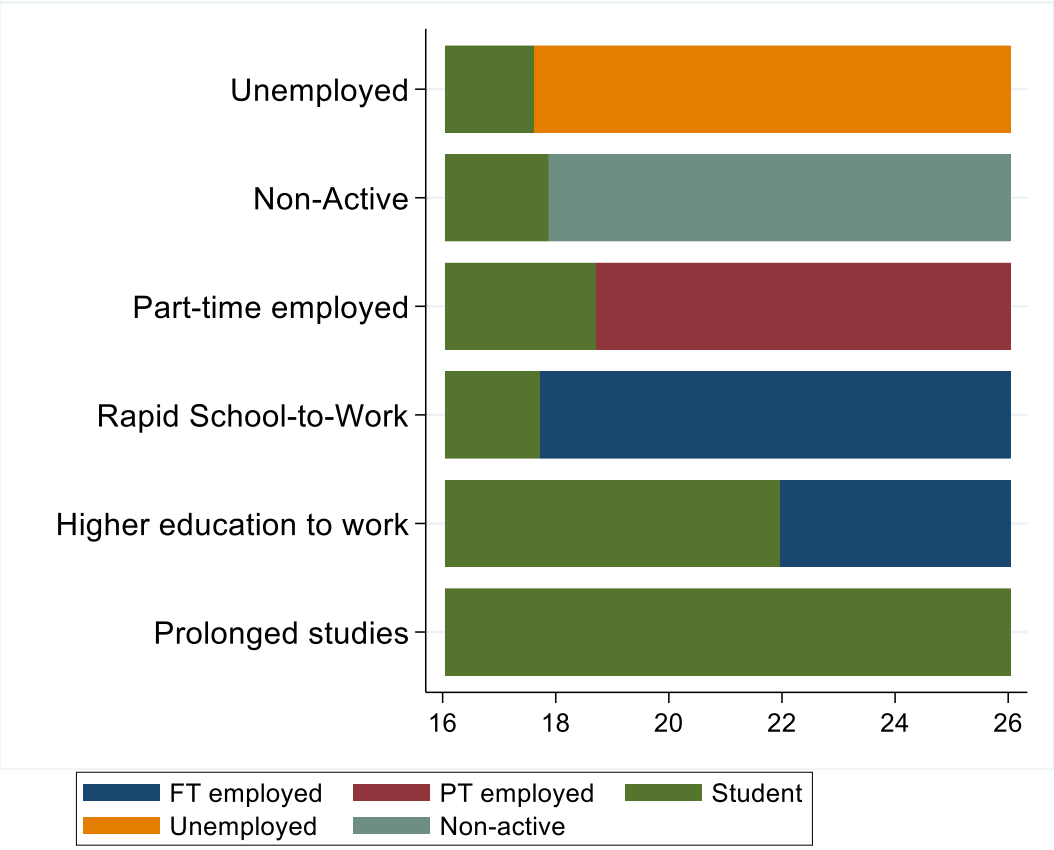


**Figure 2AA. Modal plot for education and employment pathways**




*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.
*Note*: Age on the X axis is presented in years.

**Table 3AA. Mean number of states by cluster and cohort**

| | Cohort | | |
|---|---|---|---|
| **Pathways** | **1974-79** | **1980-84** | **1985-90** |
| Rapid School-to-Work | 3.2 | 3.2 | 3.7 |
| Higher education to Work | 3.0 | 3.2 | 3.8 |
| Prolonged studies | 2.7 | 3.0 | 3.5 |
| Non-Active | 4.8 | 4.4 | 4.1 |
| Part-time employed | 4.1 | 4.0 | 4.1 |
| Unemployed | 4.3 | 4.4 | 4.6 |

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 4AA. Male and female educational attainment at age 26 and distribution by clusters**

| | Level of education | | | |
|---|---|---|---|---|
| **Pathways** | **High** | **Medium** | **Low** | **Total** |
| **Rapid School-to-Work** | | | | |
| Males | 24(7) | 103(32) | 197(61) | 324(100) |
| Females | 26(11) | 90(39) | 114(50) | 230(100) |
| **Non-Active** | | | | |
| Males | 2(9) | 5(22) | 16(70) | 23(100) |
| Females | 11(10) | 11(10) | 85(79) | 107(100) |
| **Part-time employed** | | | | |
| Males | 8(27) | 5(17) | 17(57) | 30(100) |
| Females | 10(15) | 16(24) | 40(61) | 66(100) |
| **Unemployed** | | | | |
| Males | 1(2) | 9(17) | 44(81) | 54(100) |
| Females | 4(11) | 3(8) | 30(81) | 37(100) |
| **Higher education to Work** | | | | |
| Males | 120(62) | 49(25) | 25(13) | 194(100) |
| Females | 149(72) | 45(22) | 12(6) | 206(100) |
| **Prolonged studies** | | | | |
| Males | 28(45) | 15(24) | 19(31) | 62(100) |
| Females | 27(40) | 21(31) | 20(29) | 68(100) |
| Total | 410(29) | 372(27) | 619(44) | 1,401(100) |

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.
*Note*: Proportions are reported in parentheses.

**Table 5AA. Predicted probabilities for education and employment pathways**

| **Predicted probability for pathways** | **Mean** | **Std. Dev.** | **Min** | **Max** |
|---|---|---|---|---|
| Rapid School-to-Work | 0.35 | 0.15 | 0.13 | 0.73 |
| Higher education to Work | 0.24 | 0.08 | 0.10 | 0.46 |
| Prolonged studies | 0.11 | 0.05 | 0.04 | 0.20 |
| Non-Active | 0.12 | 0.07 | 0.01 | 0.32 |
| Part-time employed | 0.09 | 0.04 | 0.02 | 0.18 |
| Unemployed | 0.09 | 0.06 | 0.01 | 0.33 |

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 6AA. Marginal effects on education and employment pathways outcomes probabilities estimated from multinomial logit models**

| Variables | Rapid School-to-Work | Higher education to Work | Prolonged studies | Non-Active | Part-time employed | Unem-ployed |
|---|---|---|---|---|---|---|
| **Gender (Males - ref.)** | | | | | | |
| Females | ***-0.060*** | ***0.096*** | -0.025 | ***0.058*** | 0 | ***-0.068*** |
| | (0.022) | (0.020) | (0.014) | (0.016) | (0.013) | (0.014) |
| **Parental SES (Service class -Ref.)** | | | | | | |
| Intermed class | ***0.249*** | -0.045 | ***-0.068*** | ***-0.065*** | ***-0.043*** | -0.028 |
| | (0.025) | (0.0240 | (0.018) | (0.020) | (0.016) | (0.016) |
| Working class | ***0.297*** | ***-0.095*** | ***-0.096*** | -0.017 | ***-0.071*** | -0.018 |
| | (0.0240 | (0.025) | (0.020) | (0.017) | (0.018) | (0.015) |
| Missing | 0.057 | ***-0.085*** | -0.037 | 0.025 | -0.026 | ***0.066*** |
| | (0.048) | (0.042) | (0.028) | (0.027) | (0.026) | (0.020) |
| **Cohort (1974-79 - Ref.)** | | | | | | |
| 1980-84 | ***0.077*** | ***0.084*** | -0.002 | ***-0.072*** | ***-0.059*** | -0.027 |
| | (0.025) | (0.022) | (0.016) | (0.018) | (0.017) | (0.015) |
| 1985-90 | -0.001 | ***0.089*** | 0.019 | ***-0.068*** | 0.004 | ***-0.043*** |
| | (0.034) | (0.029) | (0.021) | (0.024) | (0.019) | (0.022) |
| **Region of residence at age 16 (Rest of E&W- Ref.)** | | | | | | |
| London and | ***0.172*** | ***0.058*** | 0.005 | ***-0.128*** | ***-0.046*** | ***-0.060*** |
| South East | (0.026) | (0.024) | (0.017) | (0.026) | (0.019) | (0.020) |

*Note*: Estimates in italics and bold denote statistical significance at the 5% level. Standard errors are reported in parentheses.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 7AA. Predicted probabilities for occupational outcomes at age 26**

| Predicted probability for pathways | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| Professional & Managerial | 0.21 | 0.17 | 0.01 | 0.66 |
| Skilled Non-Manual | 0.23 | 0.13 | 0.01 | 0.54 |
| Skilled manual | 0.27 | 0.20 | 0.01 | 0.76 |
| Non-Active | 0.20 | 0.21 | 0.02 | 0.79 |
| Unemployed | 0.09 | 0.13 | 0.00 | 0.79 |

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 8AA. Distribution of covariates by occupational outcomes at age 26**

| Variables | Prof & Manag | Skilled Non-Manual | Skilled manual | Non-Active | Unem-ployed | Total |
|---|---|---|---|---|---|---|
| **Cohort** | | | | | | |
| 1974-79 | 153(21) | 181(25) | 216(30) | 121(17) | 50(7) | 721(100) |
| 1980-84 | 100(22) | 113(25) | 112(25) | 85(19) | 41(9) | 451(100) |
| 1985-90 | 45(20) | 44(19) | 59(26) | 58(25) | 23(10) | 229(100) |
| **Gender** | | | | | | |
| Male | 131(19) | 133(19) | 265(39) | 92(13) | 66(10) | 687(100) |
| Female | 167(23) | 205(29) | 122(17) | 172(24) | 48(7) | 714(100) |
| **Parental SES** | | | | | | |
| Service class | 170(32) | 148(28) | 114(21) | 75(14) | 27(5) | 534(100) |
| Intermediate class | 68(18) | 99(26) | 107(28) | 79(21) | 26(7) | 379(100) |
| Working class | 48(13) | 68(19) | 139(38) | 80(22) | 31(8) | 366(100) |
| Missing | 12(10) | 23(19) | 27(22) | 30(25) | 30(25) | 122(100) |
| **Migration between ages 16 and 26** | | | | | | |
| Moved to London & SE | 26(44) | 16(27) | 8(14) | 8(14) | 1(2) | 59(100) |
| Stayed in London & SE | 66(24) | 73(26) | 80(29) | 41(15) | 20(7) | 280(100) |
| Moved out from London & SE | 14(25) | 15(27) | 13(24) | 10(18) | 3(5) | 55(100) |
| Stayed outside London and SE | 192(19) | 234(23) | 286(28) | 205(20) | 90(9) | 1,007(100) |
| **Educational level at age 26** | | | | | | |
| High | 175(43) | 114(28) | 49(12) | 47(11) | 25(6) | 410(100) |
| Medium | 69(19) | 109(29) | 114(31) | 66(18) | 14(4) | 372(100) |
| Low | 54(9) | 115(19) | 224(36) | 151(24) | 75(12) | 619(100) |
| **Education and Employment Pathways** | | | | | | |
| Rapid School-to-Work | 71(13) | 156(28) | 262(47) | 46(8) | 19(3) | 554(100) |
| Non-Active | 7(5) | 10(8) | 15(12) | 90(69) | 8(6) | 130(100) |
| Part-time employed | 22(23) | 25(26) | 27(28) | 16(17) | 6(6) | 96(100) |
| Unemployed | 4(4) | 4(4) | 17(19) | 17(19) | 49(49) | 91(100) |
| Higher education to Work | 166(42) | 131(33) | 57(14) | 25(6) | 21(5) | 400(100) |
| Prolonged studies | 28(22) | 12(9) | 9(7) | 70(54) | 11(8) | 130(100) |

*Note*: Proportions are reported in parentheses.

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 9AA. Marginal effects of education and cohort interaction on occupational outcomes probabilities**

| Variables | Prof & Manag | Skilled Non-Manual | Skilled manual | Non-Active | Unem-ployed |
|---|---|---|---|---|---|
| **Cohort 1980-84 (cohort 1974-79- Ref.)** | | | | | |
| High | 0.024 | ***0.092*** | 0.046 | ***-0.093*** | ***-0.069*** |
| | (0.042) | (0.044) | (0.042) | (0.037) | (0.033) |
| Medium | ***0.117*** | -0.041 | -0.042 | -0.038 | 0.003 |
| | (0.051) | (0.052) | (0.051) | (0.043) | (0.025) |
| Low | -0.006 | 0.014 | -0.044 | 0.023 | 0.012 |
| | (0.035) | (0.040) | (0.038) | (0.028) | (0.021) |
| **Cohort 1985-90 (cohort 1974-79- Ref.)** | | | | | |
| High | -0.002 | -0.009 | 0.024 | -0.039 | 0.026 |
| | (0.049) | (0.048) | (0.049) | (0.050) | (0.050) |
| Medium | -0.039 | -0.047 | 0.007 | 0.044 | 0.036 |
| | (0.047) | (0.057) | (0.060) | (0.051) | (0.034) |
| Low | 0.026 | -0.086 | 0.034 | 0.032 | -0.006 |
| | (0.049) | (0.050) | (0.055) | (0.039) | (0.027) |

*Note*: The interaction term is not significant (Likelihood-ration test LR chi2(24) = 21.98; Prob > chi2 = 0.144). Estimates in italics and bold denote statistical significance at the 5% level. Standard errors are reported in parentheses.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 10AA. Marginal effects of education on pathways outcomes probabilities for men and women**

| Educational level | Prof & Manag | Skilled Non-Manual | Skilled manual | Non-Active | Unem-ployed |
|---|---|---|---|---|---|
| **Males- Ref.** | | | | | |
| High | ***0.106*** | ***0.119*** | -0.033 | ***-0.076*** | ***-0.115*** |
| | (0.037) | (0.035) | (0.030) | (0.033) | (0.030) |
| Medium | -0.017 | ***0.213*** | ***-0.235*** | 0.027 | 0.012 |
| | (0.039) | (0.043) | (0.042) | (0.037) | (0.022) |
| Low | 0.047 | ***0.079*** | ***-0.172*** | ***0.068*** | -0.023 |
| | (0.033) | (0.038) | (0.037) | (0.029) | (0.020) |

*Note*: The interaction term is significant (Likelihood-ration test LR chi2(24) = 25.40; Prob > chi2 = 0.0013). Estimates in italics and bold denote statistical significance at the 5% level. Standard errors are reported in parentheses
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 11AA. Marginal effects on occupational outcomes at age 26 probabilities for highly educated**

| Variables | Prof & Manag | Skilled Non-Manual | Skilled manual | Non-Active | Unem-ployed |
|---|---|---|---|---|---|
| **Parental SES (Service class -Ref.)** | | | | | |
| Intermediate class | 0.005 | 0.017 | 0.026 | -0.012 | -0.036 |
| | (0.056) | (0.054) | (0.039) | (0.042) | (0.034) |
| Working class | ***-0.147*** | 0.034 | ***0.089*** | 0.046 | -0.022 |
| | (0.068) | (0.062) | (0.041) | (0.043) | (0.039) |
| Missing | -0.113 | 0.042 | 0.021 | -0.017 | 0.066 |
| | (0.107) | (0.095) | (0.069) | (0.075) | (0.041) |
| **Gender (Males - ref.)** | | | | | |
| Females | ***0.190*** | 0.042 | ***-0.113*** | -0.039 | ***-0.080*** |
| | (0.039) | (0.039) | (0.030) | (0.029) | (0.025) |
| **Cohort (1974-79 - Ref.)** | | | | | |
| 1980-84 | ***0.098*** | 0.073 | -0.054 | -0.042 | ***-0.075*** |
| | (0.046) | (0.044) | (0.034) | (0.036) | (0.032) |
| 1985-90 | 0.069 | -0.039 | -0.063 | 0.019 | 0.015 |
| | (0.061) | (0.062) | (0.045) | (0.041) | (0.029) |
| **Migration between ages 16 and 26 (Stayed outside London and SE – Ref.)** | | | | | |
| Moved to London & SE | ***0.199*** | 0.023 | -0.002 | -0.132 | -0.087 |
| | (0.081) | (0.082) | (0.060) | (0.087) | (0.073) |
| Stayed in London & SE | 0.042 | 0.084 | -0.007 | -0.061 | -0.058 |
| | (0.052) | (0.048) | (0.036) | (0.041) | (0.033) |
| Moved out from London & SE | 0.083 | -0.003 | 0.069 | -0.118 | -0.031 |
| | (0.112) | (0.120) | (0.086) | (0.124) | (0.076) |

*Note*: Estimates in italics and bold denote statistical significance at the 5% level. Standard errors are reported in parentheses.
*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.

**Table 12AA. Marginal effects of education and socio-economic background interaction on occupational outcomes probabilities**

| Variables | Prof & Manag | Skilled Non-Manual | Skilled manual | Non-Active | Unem-ployed |
|---|---|---|---|---|---|
| **Intermediate class (Service class- Ref.)** | | | | | |
| High | -0.043 | 0.029 | 0.084 | -0.012 | -0.059 |
| | (0.048) | (0.047) | (0.045) | (0.049) | (0.037) |
| Medium | 0.018 | 0.029 | 0.023 | -0.052 | -0.017 |
| | (0.049) | (0.053) | (0.050) | (0.044) | (0.022) |
| Low | -0.047 | -0.018 | -0.014 | 0.068 | 0.010 |
| | (0.043) | (0.049) | (0.047) | (0.036) | (0.025) |
| **Working class (Service class- Ref.)** | | | | | |
| High | ***-0.124*** | 0.030 | ***0.173*** | -0.021 | -0.058 |
| | (0.048) | (0.053) | (0.059) | (0.050) | (0.041) |
| Medium | 0.020 | -0.040 | 0.067 | -0.064 | 0.018 |
| | (0.053) | (0.055) | (0.055) | (0.048) | (0.032) |
| Low | -0.053 | ***-0.105*** | 0.090 | 0.054 | 0.014 |
| | (0.042) | (0.046) | (0.047) | (0.034) | (0.024) |

*Note*: The interaction term is not significant (Likelihood-ration test LR chi2(24) = 25.69; Prob > chi2 = 0.3691). Estimates in italics and bold denote statistical significance at the 5% level. Standard errors are reported in parentheses.

*Source*: BHPS waves 1–18 and UKHLS waves 2–6; own calculations.