
Appendix A. Converting earlier occupational classifications into the 2010 version of the UK Standard Occupational Classification

The New Earnings Survey Panel Dataset (NESPD) uses occupation codes from one of four different occupational classifications depending on the period of the data:

- **Between 1975 and 1990**, occupations are coded to the 'Classification of Occupations and Directory of Occupational Titles' (CODOT). The occupation variable in the NESPD over this period does not contain the numeric occupation codes of the CODOT but rather a number that corresponds to a particular CODOT occupation.¹
- **Between 1991 and 2001**, occupations are coded to the 1990 version of the UK's Standard Occupational Classification (1990 SOC).
- **Between 2002 and 2010**, occupations are coded to the 2000 version of the UK's Standard Occupational Classification (2000 SOC).
- **Between 2011 and 2016**, occupations are coded to the 2010 version of the UK's Standard Occupational Classification (2010 SOC).

This feature of the data makes it hard to conduct consistent analysis of occupational trends over any period during which multiple occupational classifications are used. To overcome this, we assign occupation codes observed prior to 2011 to occupation codes from the 2010 SOC using a proportional mapping approach.

The proportional mapping approach we use exploits the following additional data sources that code workers' occupations according to two different occupational classifications:

1. **the 1991 Labour Force Survey** records occupation using both the Key Occupations for Statistics Purposes classification (KOS) (which is derived from the CODOT) and the 1990 SOC;
2. **the 2001 Annual Survey of Hours and Earnings** records occupation using both the 1990 SOC and the 2000 SOC;
3. **the 2011 Annual Survey of Hours and Earnings** records occupation using both the 2000 SOC and the 2010 SOC.

The additional data can be used to calculate the probability that a worker is employed in an occupation under an alternative classification, given the occupation code of the classification we observe for them. For example, the data listed under point 3 allow us to calculate the probability that a worker is employed in an occupation of the 2010 SOC conditional on their 2000 SOC occupation. We calculate these probabilities conditional on gender, which is conventional when converting between occupational classifications, except for a very small number of occupations that are observed for only one gender in

¹ See http://doc.ukdataservice.ac.uk/doc/6706/mrdoc/pdf/6706occupational_codes.pdf.

the data sets listed in points 1–3, but which we observe for both genders in the NESPD. In these few cases, we calculate the probabilities without conditioning on gender.

We use these probabilities to convert from the NESPD CODOT occupation codes to the 1990 SOC, from the 1990 SOC to the 2000 SOC and finally from the 2000 SOC to the 2010 SOC. Further details are available from the authors upon request.

Appendix B. Classifying occupations based on their task content

This work examines how occupational progression has changed for workers who start their careers in different types of occupation. When classifying occupations for this analysis, we ideally want to group together occupations that offer similar scope for progression. We therefore focus on the types of tasks that different occupations entail, as research suggests that different types of task offer very different scopes for developing workers' skills.² Specifically, we use O*NET data on the task content of occupations to classify occupations into groups depending on how intensively they involve cognitive, manual and interpersonal tasks.

The method we use to classify occupations has two steps. In the first step, we combine 161 distinct variables from the work activities, work context, skills, knowledge and abilities O*NET data files into three measures that reflect the intensity of cognitive, manual and interpersonal tasks for 366 occupations.³ Specifically, we take the first three components from a principal components analysis of the 161 O*NET variables and then rotate the factor loadings so that the following O*NET variables contribute to one summary measure only:

- 'social perceptiveness skills' (defined as being aware of others' reactions and understanding why they react as they do) contributes to the measure of interpersonal tasks only;
- 'mathematics skills' (defined as using mathematics to solve problems) contributes to the measure of cognitive tasks only;
- 'mechanical knowledge' (defined as using knowledge of machines and tools, including their designs, uses, repair and maintenance) contributes to the measure of manual tasks only.

In the second step of the classification methodology, we allocate occupations to groups by running a k-means cluster algorithm on the three summary measures of task content constructed in the first step.

The k-means algorithm is a method of identifying a pre-specified number of distinct groups in a population by minimising the difference between each observation's characteristics and the average value of characteristics within their group. Implementing the k-means algorithm requires the researcher to decide how many groups to distinguish between. To guide us in this decision, we follow the method proposed by Hennig (2007),⁴ which identifies the optimal number of groups based on cluster stability. Specifically, for a

² J. Lise and F. Postel-Vinay, 'Multidimensional skills, sorting, and human capital accumulation', Heller-Hurwicz Economics Institute, Working Paper 131, 2018, https://cla.umn.edu/sites/cla.umn.edu/files/lise_oct_2018.pdf.

³ To implement this step, we first convert the O*NET data into the UK's Standard Occupational Classification using several publicly available crosswalks between occupational classifications. Precise details of the conversion methodology are available from the authors on request. The 366 occupations correspond to four-digit occupations from the 2010 version of the UK's Standard Occupational Classification. We are unable to include elected officers and representatives, officers in the armed forces, and non-commissioned officers and other military ranks in our analysis as they are not covered in the O*NET data.

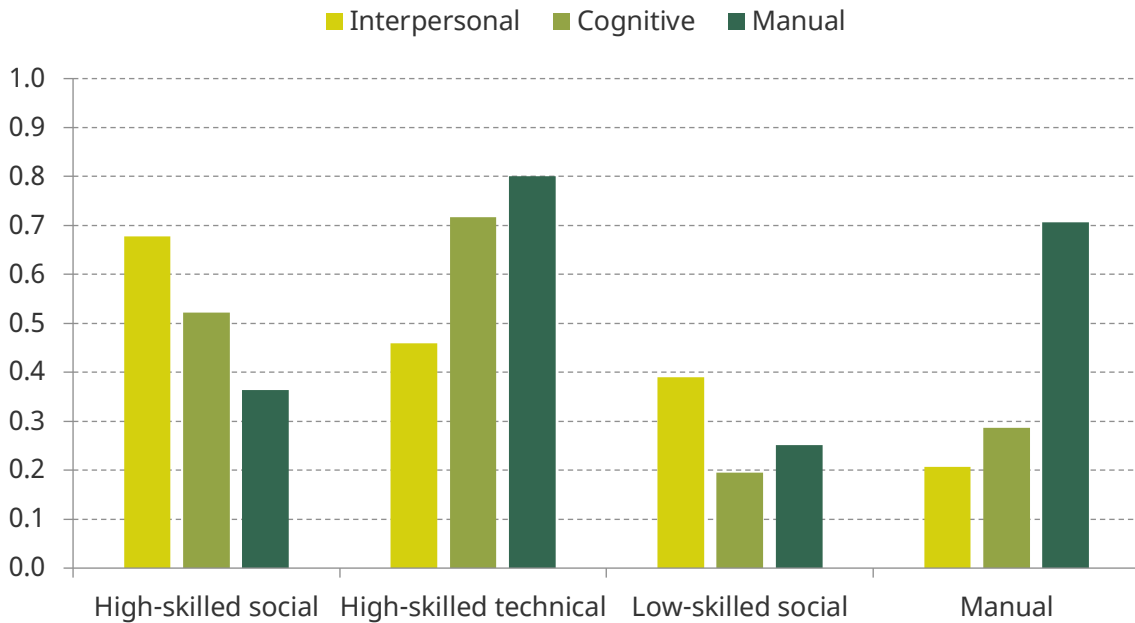
⁴ C. Hennig, 'Cluster-wise assessment of cluster stability', *Computational Statistics & Data Analysis*, 2007, 52, 258–71, <https://doi.org/10.1016/j.csda.2006.11.025>.

given number of groups, we calculated the mean Jaccard coefficient over 100 repetitions of the k-means cluster algorithm implemented on a bootstrapped sample of occupations. The optimal number of groups is then taken as the highest for which the mean Jaccard coefficient was at least 0.75 (which Hennig suggests as a threshold level to define a 'stable' grouping). This approach identified four groups as the optimal number.

Figure B1 summarises the results of the occupation grouping methodology by showing the mean level of the interpersonal, cognitive and manual task measures among occupations in each group. The task measures range between 0 and 1, with higher values indicating that a task is used more intensely. We refer to the four occupation groups as high-skilled social, high-skilled technical, low-skilled social and manual, as these titles are broadly descriptive of the average task profiles shown in Figure B1.

The occupation groups consist of 133, 59, 86 and 88 SOC occupations respectively. Table B1 provides values of the three summary task measures and the group membership for each four-digit occupation of the 2010 UK Standard Occupational Classification.

Figure B1. Occupation mean task measures by broad task-based occupation group



Source: Authors' analysis of O*NET (version 21.1), Bureau of Labor Statistics employment by detailed occupation (table 1.2, 2016), Bureau of Labor Statistics mapping between US occupation codes and ISCO occupation codes, and ONS mapping between UK occupation codes and ISCO occupation codes.

Table B1. Task-based group membership and task summary measures by occupation

SOC 2010 code	SOC 2010 title	Task-based occupation group	Interpersonal task intensity	Cognitive task intensity	Manual task intensity	Require a degree to do job (% of workers)
1115	Chief executives and senior officials	High-skilled social	0.63	0.64	0.53	53
1116	Elected officers and representatives	-	-	-	-	-
1121	Production managers and directors in manufacturing	High-skilled technical	0.56	0.80	0.85	49
1122	Production managers and directors in construction	High-skilled technical	0.60	0.86	0.73	80
1123	Production managers and directors in mining and energy	High-skilled social	0.67	0.68	0.48	87
1131	Financial managers and directors	High-skilled social	0.69	0.65	0.24	85
1132	Marketing and sales directors	High-skilled social	0.71	0.68	0.31	86
1133	Purchasing managers and directors	High-skilled social	0.61	0.62	0.46	65
1134	Advertising and public relations directors	High-skilled social	0.71	0.59	0.22	78
1135	Human resource managers and directors	High-skilled social	0.84	0.59	0.20	94
1136	Information technology and telecommunications directors	High-skilled technical	0.59	0.80	0.56	65
1139	Functional managers and directors n.e.c.	High-skilled social	0.67	0.68	0.48	87
1150	Financial institution managers and directors	High-skilled social	0.63	0.62	0.48	56
1161	Managers and directors in transport and distribution	High-skilled social	0.61	0.62	0.46	65
1162	Managers and directors in storage and warehousing	High-skilled social	0.61	0.62	0.46	65
1171	Officers in armed forces	-	-	-	-	-
1172	Senior police officers	High-skilled social	0.82	0.46	0.48	25
1173	Senior officers in fire, ambulance, prison and related services	High-skilled social	0.67	0.68	0.48	87
1181	Health services and public health managers and directors	High-skilled social	0.79	0.67	0.32	81
1184	Social services managers and directors	High-skilled social	1.00	0.58	0.27	79
1190	Managers and directors in retail and wholesale	High-skilled social	0.61	0.62	0.54	48

1211	Managers and proprietors in agriculture and horticulture	High-skilled technical	0.54	0.65	0.84	43
1213	Managers and proprietors in forestry, fishing and related services	High-skilled technical	0.54	0.65	0.84	43
1221	Hotel and accommodation managers and proprietors	High-skilled social	0.71	0.63	0.52	29
1223	Restaurant and catering establishment managers and proprietors	High-skilled social	0.61	0.49	0.56	11
1224	Publicans and managers of licensed premises	High-skilled social	0.71	0.63	0.52	29
1225	Leisure and sports managers	High-skilled social	0.67	0.68	0.48	87
1226	Travel agency managers and proprietors	High-skilled social	0.67	0.68	0.48	87
1241	Health care practice managers	Low-skilled social	0.44	0.22	0.07	0
1242	Residential, day and domiciliary care managers and proprietors	High-skilled social	0.63	0.63	0.51	52
1251	Property, housing and estate managers	High-skilled social	0.67	0.68	0.48	87
1252	Garage managers and proprietors	High-skilled social	0.67	0.68	0.48	87
1253	Hairdressing and beauty salon managers and proprietors	High-skilled social	0.67	0.68	0.48	87
1254	Shopkeepers and proprietors: wholesale and retail	High-skilled social	0.61	0.62	0.54	48
1255	Waste disposal and environmental services managers	High-skilled social	0.67	0.68	0.48	87
1259	Managers and proprietors in other services n.e.c.	High-skilled social	0.67	0.68	0.48	87
2111	Chemical scientists	High-skilled technical	0.40	0.75	0.83	96
2112	Biological scientists and biochemists	High-skilled technical	0.68	0.79	0.61	99
2113	Physical scientists	High-skilled technical	0.60	0.92	0.73	97
2114	Social and humanities scientists	High-skilled social	0.82	0.61	0.31	100
2119	Natural and social science professionals n.e.c.	High-skilled technical	0.68	0.79	0.61	99
2121	Civil engineers	High-skilled technical	0.59	1.00	0.77	100
2122	Mechanical engineers	High-skilled technical	0.40	0.99	0.92	95
2123	Electrical engineers	High-skilled technical	0.37	0.86	0.78	95
2124	Electronics engineers	High-skilled technical	0.34	0.90	0.85	85

2126	Design and development engineers	High-skilled technical	0.49	0.95	0.90	94
2127	Production and process engineers	High-skilled technical	0.53	0.83	0.69	85
2129	Engineering professionals n.e.c.	High-skilled technical	0.49	0.95	0.90	94
2133	IT specialist managers	High-skilled social	0.51	0.73	0.46	81
2134	IT project and programme managers	High-skilled social	0.51	0.73	0.46	81
2135	IT business analysts, architects and systems designers	High-skilled technical	0.59	0.80	0.58	70
2136	Programmers and software development professionals	High-skilled technical	0.34	0.73	0.51	95
2137	Web design and development professionals	High-skilled social	0.45	0.71	0.48	43
2139	Information technology and telecommunications professionals n.e.c.	High-skilled social	0.51	0.73	0.46	81
2141	Conservation professionals	High-skilled social	0.65	0.71	0.54	97
2142	Environment professionals	High-skilled social	0.65	0.71	0.54	97
2150	Research and development managers	High-skilled technical	0.58	0.86	0.72	93
2211	Medical practitioners	High-skilled social	0.89	0.54	0.40	99
2212	Psychologists	High-skilled social	0.94	0.40	0.04	100
2213	Pharmacists	High-skilled social	0.76	0.49	0.36	100
2214	Ophthalmic opticians	High-skilled social	0.76	0.54	0.47	100
2215	Dental practitioners	High-skilled technical	0.73	0.60	0.71	88
2216	Veterinarians	High-skilled social	0.75	0.44	0.50	100
2217	Medical radiographers	High-skilled social	0.58	0.34	0.56	17
2218	Podiatrists	High-skilled social	0.77	0.36	0.31	95
2219	Health professionals n.e.c.	High-skilled social	0.77	0.36	0.31	95
2221	Physiotherapists	High-skilled social	0.74	0.32	0.38	100
2222	Occupational therapists	High-skilled social	0.77	0.36	0.31	95
2223	Speech and language therapists	High-skilled social	0.73	0.39	0.21	100
2229	Therapy professionals n.e.c.	High-skilled social	0.94	0.40	0.04	100
2231	Nurses	High-skilled social	0.90	0.40	0.37	66
2232	Midwives	High-skilled social	0.94	0.38	0.31	97
2311	Higher education teaching professionals	High-skilled social	0.75	0.52	0.23	96
2312	Further education teaching professionals	High-skilled social	0.65	0.43	0.42	46
2314	Secondary education teaching professionals	High-skilled social	0.71	0.46	0.25	100

2315	Primary and nursery education teaching professionals	High-skilled social	0.72	0.41	0.20	100
2316	Special needs education teaching professionals	High-skilled social	0.76	0.36	0.19	100
2317	Senior professionals of educational establishments	High-skilled social	0.94	0.62	0.27	100
2318	Education advisers and school inspectors	High-skilled social	0.80	0.63	0.28	98
2319	Teaching and other educational professionals n.e.c.	High-skilled social	0.66	0.35	0.10	76
2412	Barristers and judges	High-skilled social	0.75	0.56	0.19	100
2413	Solicitors	High-skilled social	0.75	0.56	0.19	100
2419	Legal professionals n.e.c.	High-skilled social	0.75	0.56	0.19	100
2421	Chartered and certified accountants	High-skilled social	0.59	0.60	0.25	91
2423	Management consultants and business analysts	High-skilled social	0.80	0.75	0.34	96
2424	Business and financial project management professionals	High-skilled social	0.80	0.75	0.34	96
2425	Actuaries, economists and statisticians	High-skilled social	0.58	0.80	0.40	100
2426	Business and related research professionals	High-skilled social	0.55	0.67	0.48	55
2429	Business, research and administrative professionals n.e.c.	High-skilled social	0.55	0.67	0.48	55
2431	Architects	High-skilled technical	0.71	0.97	0.71	100
2432	Town planning officers	High-skilled social	0.83	0.76	0.37	100
2433	Quantity surveyors	High-skilled technical	0.49	0.95	0.90	94
2434	Chartered surveyors	High-skilled technical	0.51	0.76	0.81	70
2435	Chartered architectural technologists	High-skilled technical	0.71	0.97	0.71	100
2436	Construction project managers and related professionals	High-skilled technical	0.60	0.86	0.73	80
2442	Social workers	High-skilled social	0.86	0.29	0.07	93
2443	Probation officers	High-skilled social	0.86	0.29	0.07	93
2444	Clergy	High-skilled social	0.85	0.42	0.13	97
2449	Welfare professionals n.e.c.	High-skilled social	0.86	0.29	0.07	93
2451	Librarians	High-skilled social	0.62	0.46	0.26	94
2452	Archivists and curators	High-skilled social	0.73	0.56	0.33	98
2461	Quality control and planning engineers	High-skilled technical	0.49	0.95	0.90	94

2462	Quality assurance and regulatory professionals	High-skilled social	0.80	0.75	0.34	96
2463	Environmental health professionals	High-skilled social	0.74	0.58	0.46	90
2471	Journalists, newspaper and periodical editors	High-skilled social	0.58	0.49	0.23	86
2472	Public relations professionals	High-skilled social	0.73	0.53	0.15	100
2473	Advertising accounts managers and creative directors	High-skilled social	0.64	0.61	0.24	92
3111	Laboratory technicians	High-skilled technical	0.32	0.57	0.74	48
3112	Electrical and electronics technicians	High-skilled technical	0.24	0.69	0.90	13
3113	Engineering technicians	High-skilled technical	0.31	0.72	0.98	38
3114	Building and civil engineering technicians	High-skilled technical	0.46	0.60	0.70	27
3115	Quality assurance technicians	High-skilled technical	0.42	0.66	0.84	38
3116	Planning, process and production technicians	High-skilled technical	0.24	0.66	0.92	10
3119	Science, engineering and production technicians n.e.c.	High-skilled technical	0.42	0.66	0.84	38
3121	Architectural and town planning technicians	High-skilled technical	0.46	0.60	0.70	27
3122	Draughtspersons	High-skilled technical	0.25	0.64	0.62	36
3131	IT operations technicians	High-skilled technical	0.36	0.53	0.60	3
3132	IT user support technicians	High-skilled technical	0.39	0.57	0.63	33
3213	Paramedics	High-skilled social	0.77	0.42	0.74	5
3216	Dispensing opticians	High-skilled social	0.50	0.48	0.47	0
3217	Pharmaceutical technicians	Low-skilled social	0.49	0.29	0.35	4
3218	Medical and dental technicians	High-skilled social	0.58	0.34	0.56	17
3219	Health associate professionals n.e.c.	High-skilled social	0.90	0.38	0.37	60
3231	Youth and community workers	High-skilled social	0.76	0.26	0.20	58
3233	Child and early years officers	High-skilled social	0.76	0.26	0.20	58
3234	Housing officers	High-skilled social	0.76	0.26	0.20	58
3235	Counsellors	High-skilled social	0.86	0.29	0.07	93
3239	Welfare and housing associate professionals n.e.c.	High-skilled social	0.76	0.26	0.20	58
3311	NCOs and other ranks	-	-	-	-	-

3312	Police officers (sergeant and below)	High-skilled social	0.84	0.34	0.50	7
3313	Fire service officers (watch manager and below)	High-skilled technical	0.63	0.45	0.91	13
3314	Prison service officers (below principal officer)	Low-skilled social	0.67	0.20	0.39	0
3315	Police community support officers	High-skilled social	0.84	0.34	0.50	7
3319	Protective service associate professionals n.e.c.	Low-skilled social	0.51	0.19	0.32	8
3411	Artists	Manual	0.24	0.39	0.60	31
3412	Authors, writers and translators	High-skilled social	0.53	0.49	0.24	66
3413	Actors, entertainers and presenters	Low-skilled social	0.54	0.14	0.11	12
3414	Dancers and choreographers	Low-skilled social	0.58	0.32	0.14	65
3415	Musicians	Low-skilled social	0.47	0.26	0.25	52
3416	Arts officers, producers and directors	High-skilled social	0.57	0.60	0.38	70
3417	Photographers, audio-visual and broadcasting equipment operators	Manual	0.38	0.46	0.61	17
3421	Graphic designers	High-skilled social	0.44	0.57	0.37	65
3422	Product, clothing and related designers	High-skilled technical	0.39	0.55	0.53	44
3441	Sports players	High-skilled social	0.59	0.36	0.62	24
3442	Sports coaches, instructors and officials	High-skilled social	0.60	0.31	0.32	56
3443	Fitness instructors	Low-skilled social	0.56	0.23	0.29	39
3511	Air traffic controllers	High-skilled social	0.56	0.50	0.56	8
3512	Aircraft pilots and flight engineers	High-skilled technical	0.56	0.50	0.69	26
3513	Ship and hovercraft officers	High-skilled social	0.55	0.49	0.62	7
3520	Legal associate professionals	Low-skilled social	0.48	0.32	0.13	38
3531	Estimators, valuers and assessors	High-skilled social	0.50	0.46	0.32	53
3532	Brokers	High-skilled social	0.66	0.59	0.25	44
3533	Insurance underwriters	High-skilled social	0.63	0.51	0.20	46
3534	Finance and investment analysts and advisers	High-skilled social	0.62	0.60	0.22	95
3535	Taxation experts	High-skilled social	0.59	0.60	0.25	91
3536	Importers and exporters	High-skilled social	0.64	0.58	0.25	41
3537	Financial and accounting technicians	High-skilled social	0.47	0.48	0.21	55

3538	Financial accounts managers	Low-skilled social	0.35	0.36	0.18	18
3539	Business and related associate professionals n.e.c.	High-skilled social	0.54	0.55	0.32	86
3541	Buyers and procurement officers	High-skilled social	0.58	0.64	0.39	71
3542	Business sales executives	High-skilled social	0.53	0.60	0.32	58
3543	Marketing associate professionals	High-skilled social	0.64	0.61	0.24	92
3544	Estate agents and auctioneers	High-skilled social	0.67	0.58	0.31	32
3545	Sales accounts and business development managers	High-skilled social	0.61	0.61	0.35	37
3546	Conference and exhibition managers and organisers	High-skilled social	0.70	0.53	0.43	41
3550	Conservation and environmental associate professionals	High-skilled technical	0.51	0.49	0.79	4
3561	Public services associate professionals	High-skilled social	0.52	0.42	0.55	12
3562	Human resources and industrial relations officers	High-skilled social	0.70	0.42	0.13	69
3563	Vocational and industrial trainers and instructors	High-skilled social	0.81	0.55	0.19	89
3564	Careers advisers and vocational guidance specialists	High-skilled social	0.70	0.42	0.13	69
3565	Inspectors of standards and regulations	High-skilled social	0.52	0.42	0.55	12
3567	Health and safety officers	High-skilled social	0.53	0.49	0.60	11
4112	National government administrative occupations	High-skilled social	0.63	0.43	0.30	57
4113	Local government administrative occupations	Low-skilled social	0.35	0.19	0.15	34
4114	Officers of non-governmental organisations	Low-skilled social	0.35	0.19	0.15	34
4121	Credit controllers	Low-skilled social	0.53	0.42	0.12	34
4122	Book-keepers, payroll managers and wages clerks	Low-skilled social	0.35	0.33	0.17	14
4123	Bank and post office clerks	Low-skilled social	0.37	0.23	0.25	0
4124	Finance officers	Low-skilled social	0.35	0.33	0.17	14
4129	Financial administrative occupations n.e.c.	Low-skilled social	0.37	0.23	0.25	0
4131	Records clerks and assistants	Low-skilled social	0.56	0.25	0.05	41

4132	Pensions and insurance clerks and assistants	Low-skilled social	0.43	0.34	0.13	8
4133	Stock control clerks and assistants	Low-skilled social	0.21	0.13	0.35	3
4134	Transport and distribution clerks and assistants	High-skilled social	0.54	0.52	0.37	9
4135	Library clerks and assistants	Low-skilled social	0.40	0.24	0.27	46
4138	Human resources administrative occupations	Low-skilled social	0.52	0.31	0.10	17
4151	Sales administrators	Low-skilled social	0.33	0.20	0.30	0
4159	Other administrative occupations n.e.c.	High-skilled social	0.44	0.45	0.36	3
4161	Office managers	High-skilled social	0.59	0.52	0.32	47
4162	Office supervisors	High-skilled social	0.59	0.52	0.32	47
4211	Medical secretaries	Low-skilled social	0.44	0.22	0.07	0
4212	Legal secretaries	Low-skilled social	0.38	0.29	0.15	6
4213	School secretaries	Low-skilled social	0.49	0.36	0.17	4
4214	Company secretaries	High-skilled social	0.69	0.65	0.24	85
4215	Personal assistants and other secretaries	Low-skilled social	0.49	0.36	0.17	4
4216	Receptionists	Low-skilled social	0.41	0.20	0.11	3
4217	Typists and related keyboard occupations	Low-skilled social	0.31	0.28	0.26	1
5111	Farmers	High-skilled technical	0.46	0.51	0.82	34
5112	Horticultural trades	Manual	0.38	0.39	0.72	19
5113	Gardeners and landscape gardeners	Manual	0.38	0.39	0.72	19
5114	Groundsmen and greenkeepers	Manual	0.38	0.39	0.72	19
5119	Agricultural and fishing trades n.e.c.	Manual	0.33	0.38	0.80	23
5211	Smiths and forge workers	Manual	0.13	0.33	0.79	0
5212	Moulders, core makers and die casters	Manual	0.09	0.25	0.76	0
5213	Sheet metal workers	Manual	0.19	0.41	0.89	0
5214	Metal plate workers, and riveters	Manual	0.15	0.28	0.81	4
5215	Welding trades	Manual	0.08	0.24	0.71	0
5216	Pipe fitters	Manual	0.22	0.41	0.90	0
5221	Metal machining setters and setter-operators	Manual	0.13	0.39	0.87	3
5222	Tool makers, tool fitters and markers-out	High-skilled technical	0.20	0.55	0.92	3
5223	Metal working production and maintenance fitters	High-skilled technical	0.29	0.56	1.00	9

5224	Precision instrument makers and repairers	High-skilled technical	0.50	0.71	0.95	11
5225	Air-conditioning and refrigeration engineers	High-skilled technical	0.44	0.67	0.98	8
5231	Vehicle technicians, mechanics and electricians	Manual	0.28	0.48	0.91	3
5232	Vehicle body builders and repairers	Manual	0.24	0.45	0.90	2
5234	Vehicle paint technicians	Manual	0.16	0.29	0.79	0
5235	Aircraft maintenance and related trades	High-skilled technical	0.48	0.70	0.98	10
5236	Boat and ship builders and repairers	High-skilled technical	0.29	0.56	1.00	9
5237	Rail and rolling stock builders and repairers	High-skilled technical	0.29	0.56	1.00	9
5241	Electricians and electrical fitters	High-skilled technical	0.30	0.54	0.98	7
5242	Telecommunications engineers	High-skilled technical	0.36	0.87	0.86	76
5244	TV, video and audio engineers	High-skilled technical	0.39	0.76	0.89	42
5245	IT engineers	High-skilled technical	0.39	0.58	0.88	6
5249	Electrical and electronic trades n.e.c.	High-skilled technical	0.39	0.76	0.89	42
5250	Skilled metal, electrical and electronic trades supervisors	High-skilled technical	0.42	0.54	0.77	24
5311	Steel erectors	Manual	0.15	0.28	0.81	4
5312	Bricklayers and masons	Manual	0.29	0.39	0.86	2
5313	Roofers, roof tilers and slaters	Manual	0.31	0.32	0.79	7
5314	Plumbers and heating and ventilating engineers	Manual	0.22	0.41	0.90	0
5315	Carpenters and joiners	Manual	0.29	0.40	0.87	2
5316	Glaziers, window fabricators and fitters	Manual	0.16	0.24	0.66	0
5319	Construction and building trades n.e.c.	High-skilled technical	0.60	0.86	0.73	80
5321	Plasterers	Manual	0.16	0.22	0.67	3
5322	Floorers and wall tilers	Manual	0.20	0.28	0.72	0
5323	Painters and decorators	Manual	0.34	0.25	0.60	10
5330	Construction and building trades supervisors	High-skilled technical	0.46	0.66	0.89	5
5411	Weavers and knitters	Manual	0.05	0.07	0.42	2
5412	Upholsterers	Manual	0.21	0.33	0.74	0
5413	Footwear and leather working trades	Manual	0.05	0.07	0.42	2
5414	Tailors and dressmakers	Manual	0.25	0.27	0.50	0

5419	Textiles, garments and related trades n.e.c.	Manual	0.15	0.22	0.48	3
5421	Pre-press technicians	Manual	0.27	0.52	0.60	14
5422	Printers	Manual	0.09	0.31	0.76	0
5423	Print finishing and binding workers	Manual	0.18	0.31	0.72	0
5431	Butchers	Manual	0.17	0.13	0.49	0
5432	Bakers and flour confectioners	Manual	0.19	0.22	0.46	0
5433	Fishmongers and poultry dressers	Manual	0.17	0.13	0.49	0
5434	Chefs	Low-skilled social	0.44	0.34	0.47	11
5435	Cooks	Low-skilled social	0.30	0.22	0.45	9
5436	Catering and bar managers	High-skilled social	0.61	0.49	0.56	11
5441	Glass and ceramics makers, decorators and finishers	Manual	0.18	0.35	0.74	12
5442	Furniture makers and other craft woodworkers	Manual	0.10	0.34	0.86	0
5443	Florists	Low-skilled social	0.24	0.28	0.44	8
5449	Other skilled trades n.e.c.	Manual	0.12	0.24	0.56	1
6121	Nursery nurses and assistants	Low-skilled social	0.47	0.18	0.15	20
6122	Childminders and related occupations	Low-skilled social	0.49	0.16	0.28	13
6123	Playworkers	Low-skilled social	0.49	0.16	0.28	13
6125	Teaching assistants	Low-skilled social	0.47	0.18	0.15	20
6126	Educational support assistants	Low-skilled social	0.47	0.18	0.15	20
6131	Veterinary nurses	Low-skilled social	0.48	0.31	0.50	4
6132	Pest control officers	Manual	0.45	0.42	0.66	20
6139	Animal care services occupations n.e.c.	Low-skilled social	0.46	0.25	0.35	19
6141	Nursing auxiliaries and assistants	Low-skilled social	0.47	0.10	0.29	1
6142	Ambulance staff (excluding paramedics)	High-skilled social	0.77	0.42	0.74	5
6143	Dental nurses	Low-skilled social	0.51	0.27	0.46	13
6144	Houseparents and residential wardens	Low-skilled social	0.48	0.25	0.44	10
6145	Care workers and home carers	Low-skilled social	0.44	0.08	0.25	7
6146	Senior care workers	Low-skilled social	0.44	0.08	0.25	7
6147	Care escorts	Low-skilled social	0.48	0.25	0.44	10

6148	Undertakers, mortuary and crematorium assistants	High-skilled social	0.63	0.29	0.40	13
6211	Sports and leisure assistants	Low-skilled social	0.44	0.19	0.27	5
6212	Travel agents	High-skilled social	0.66	0.54	0.28	23
6214	Air travel assistants	High-skilled social	0.54	0.32	0.46	4
6215	Rail travel assistants	High-skilled social	0.54	0.45	0.55	5
6219	Leisure and travel service occupations n.e.c.	High-skilled social	0.61	0.35	0.28	28
6221	Hairdressers and barbers	Low-skilled social	0.48	0.30	0.36	8
6222	Beauticians and related occupations	Low-skilled social	0.45	0.27	0.34	7
6231	Housekeepers and related occupations	Manual	0.45	0.35	0.55	8
6232	Caretakers	Low-skilled social	0.13	0.00	0.38	9
6240	Cleaning and housekeeping managers and supervisors	Manual	0.45	0.35	0.55	8
7111	Sales and retail assistants	Low-skilled social	0.43	0.26	0.29	9
7112	Retail cashiers and check-out operators	Low-skilled social	0.27	0.07	0.22	2
7113	Telephone salespersons	Low-skilled social	0.20	0.10	0.01	0
7114	Pharmacy and other dispensing assistants	Low-skilled social	0.46	0.27	0.32	7
7115	Vehicle and parts salespersons and advisers	Low-skilled social	0.43	0.26	0.29	9
7121	Collector salespersons and credit agents	Low-skilled social	0.39	0.16	0.00	0
7122	Debt, rent and other cash collectors	Low-skilled social	0.49	0.34	0.10	20
7123	Roundspersons and van salespersons	Low-skilled social	0.39	0.16	0.00	0
7124	Market and street traders and assistants	Low-skilled social	0.39	0.16	0.00	0
7125	Merchandisers and window dressers	Low-skilled social	0.38	0.20	0.26	1
7129	Sales related occupations n.e.c.	Low-skilled social	0.38	0.20	0.26	1
7130	Sales supervisors	High-skilled social	0.52	0.38	0.43	7
7211	Call and contact centre occupations	Low-skilled social	0.56	0.29	0.13	36
7213	Telephonists	Low-skilled social	0.33	0.17	0.14	6
7214	Communication operators	Low-skilled social	0.33	0.17	0.14	6
7215	Market research interviewers	Low-skilled social	0.29	0.19	0.08	12
7219	Customer service occupations n.e.c.	Low-skilled social	0.41	0.20	0.11	3

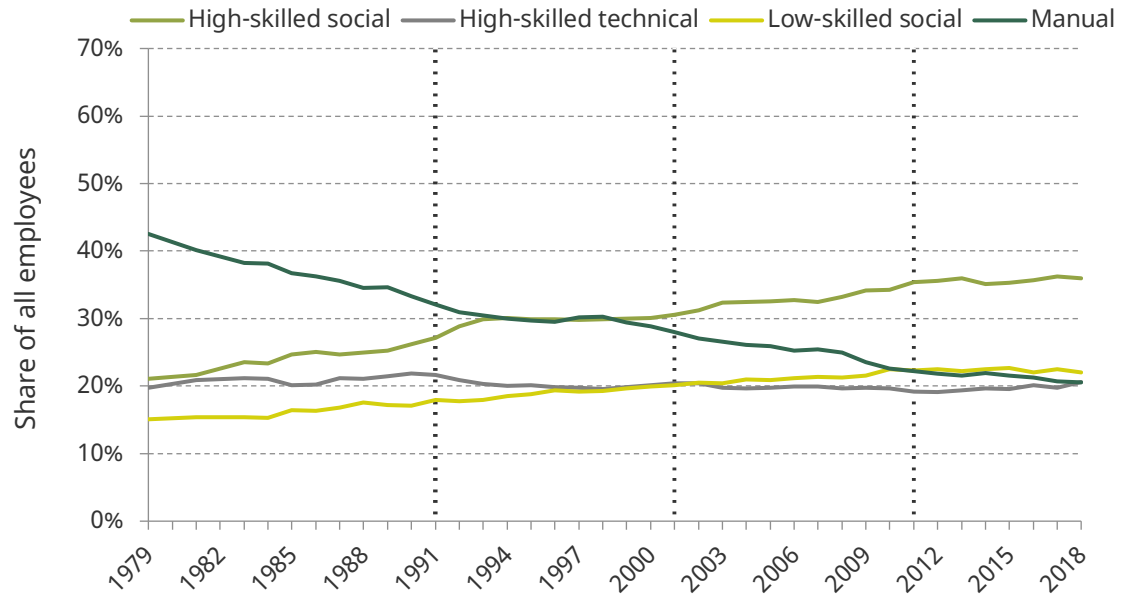
7220	Customer service managers and supervisors	High-skilled social	0.59	0.52	0.32	47
8111	Food, drink and tobacco process operatives	Manual	0.17	0.27	0.68	1
8112	Glass and ceramics process operatives	Manual	0.17	0.31	0.78	2
8113	Textile process operatives	Manual	0.17	0.22	0.69	0
8114	Chemical and related process operatives	Manual	0.23	0.41	0.84	3
8115	Rubber process operatives	Manual	0.17	0.30	0.78	3
8116	Plastics process operatives	Manual	0.12	0.30	0.79	0
8117	Metal making and treating process operatives	Manual	0.14	0.29	0.80	0
8118	Electroplaters	Manual	0.17	0.28	0.77	1
8119	Process operatives n.e.c.	Manual	0.17	0.31	0.79	0
8121	Paper and wood machine operatives	Manual	0.00	0.22	0.78	2
8122	Coal mine operatives	Manual	0.21	0.31	0.89	1
8123	Quarry workers and related operatives	Manual	0.24	0.33	0.87	1
8124	Energy plant operatives	High-skilled technical	0.33	0.51	0.84	11
8125	Metal working machine operatives	Manual	0.13	0.39	0.87	3
8126	Water and sewerage plant operatives	High-skilled technical	0.41	0.54	0.80	22
8127	Printing machine assistants	Manual	0.09	0.31	0.76	0
8129	Plant and machine operatives n.e.c.	Manual	0.20	0.37	0.81	0
8131	Assemblers (electrical and electronic products)	Manual	0.13	0.31	0.67	2
8132	Assemblers (vehicles and metal goods)	Manual	0.20	0.43	0.87	12
8133	Routine inspectors and testers	Manual	0.17	0.32	0.57	3
8134	Weighers, graders and sorters	Manual	0.17	0.32	0.57	3
8135	Tyre, exhaust and windscreen fitters	Manual	0.28	0.48	0.91	3
8137	Sewing machinists	Manual	0.04	0.10	0.49	3
8139	Assemblers and routine operatives n.e.c.	Manual	0.17	0.23	0.61	0
8141	Scaffolders, staggers and riggers	Manual	0.31	0.42	0.83	11
8142	Road construction operatives	Manual	0.29	0.27	0.80	0
8143	Rail construction and maintenance operatives	Manual	0.29	0.27	0.80	0

8149	Construction operatives n.e.c.	Manual	0.18	0.34	0.85	0
8211	Large goods vehicle drivers	Manual	0.35	0.31	0.75	6
8212	Van drivers	Manual	0.31	0.16	0.50	1
8213	Bus and coach drivers	Low-skilled social	0.37	0.17	0.49	5
8214	Taxi and cab drivers and chauffeurs	Manual	0.31	0.16	0.50	1
8215	Driving instructors	Low-skilled social	0.52	0.24	0.24	52
8221	Crane drivers	Low-skilled social	0.38	0.24	0.44	2
8222	Fork-lift truck drivers	Manual	0.32	0.29	0.67	2
8223	Agricultural machinery drivers	Manual	0.07	0.21	0.79	1
8229	Mobile machine drivers and operatives n.e.c.	Manual	0.20	0.34	0.86	0
8231	Train and tram drivers	High-skilled social	0.51	0.44	0.61	5
8232	Marine and waterways transport operatives	Manual	0.32	0.32	0.87	1
8233	Air transport operatives	Manual	0.14	0.08	0.57	2
8234	Rail transport operatives	High-skilled social	0.51	0.43	0.59	5
8239	Other drivers and transport operatives n.e.c.	Manual	0.14	0.08	0.57	2
9111	Farm workers	Manual	0.16	0.09	0.56	2
9112	Forestry workers	Manual	0.42	0.43	0.79	40
9119	Fishing and other elementary agriculture occupations n.e.c.	Manual	0.11	0.08	0.57	14
9120	Elementary construction occupations	Manual	0.24	0.27	0.79	2
9132	Industrial cleaning process occupations	Manual	0.12	0.09	0.59	1
9134	Packers, bottlers, canners and fillers	Low-skilled social	0.29	0.13	0.44	0
9139	Elementary process plant occupations n.e.c.	Manual	0.12	0.09	0.59	1
9211	Postal workers, mail sorters, messengers and couriers	Low-skilled social	0.21	0.04	0.37	0
9219	Elementary administration occupations n.e.c.	Low-skilled social	0.26	0.03	0.38	2
9231	Window cleaners	Low-skilled social	0.13	0.00	0.38	9
9232	Street cleaners	Manual	0.29	0.27	0.80	0
9233	Cleaners and domestics	Low-skilled social	0.16	0.01	0.36	5
9234	Launderers, dry cleaners and pressers	Manual	0.03	0.04	0.49	0
9235	Refuse and salvage occupations	Manual	0.41	0.35	0.60	4

9236	Vehicle valeters and cleaners	Manual	0.05	0.03	0.46	0
9239	Elementary cleaning occupations n.e.c.	Low-skilled social	0.16	0.01	0.36	5
9241	Security guards and related occupations	Low-skilled social	0.53	0.15	0.33	0
9242	Parking and civil enforcement occupations	Low-skilled social	0.27	0.06	0.29	1
9244	School midday and crossing patrol occupations	Low-skilled social	0.27	0.06	0.29	1
9249	Elementary security occupations n.e.c.	Low-skilled social	0.27	0.06	0.29	1
9251	Shelf fillers	Low-skilled social	0.20	0.09	0.31	3
9259	Elementary sales occupations n.e.c.	Low-skilled social	0.39	0.16	0.00	0
9260	Elementary storage occupations	Manual	0.14	0.08	0.57	2
9271	Hospital porters	Low-skilled social	0.16	0.01	0.36	5
9272	Kitchen and catering assistants	Low-skilled social	0.18	0.05	0.37	4
9273	Waiters and waitresses	Low-skilled social	0.27	0.00	0.19	0
9274	Bar staff	Low-skilled social	0.46	0.16	0.37	10
9275	Leisure and theme park attendants	Low-skilled social	0.27	0.06	0.29	1
9279	Other elementary services occupations n.e.c.	Low-skilled social	0.26	0.04	0.34	1

Appendix C. Supplementary figures and tables

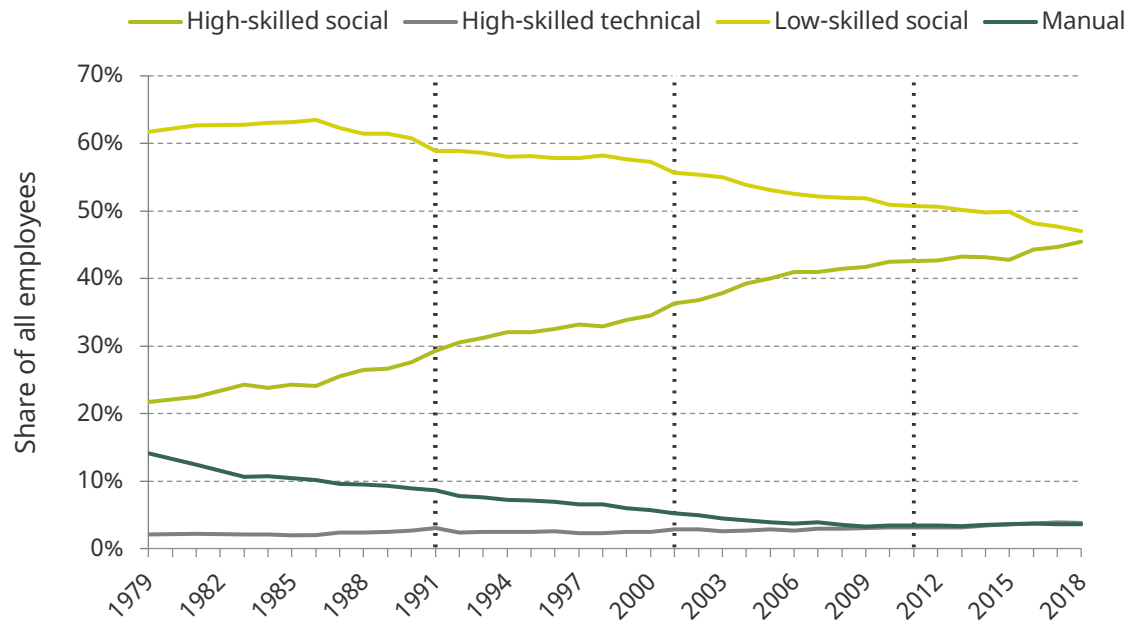
Figure C1. Occupational composition of male employees in the UK



Note: Dashed lines indicate changes in occupational classifications.

Source: Labour Force Survey, 1979–2018.

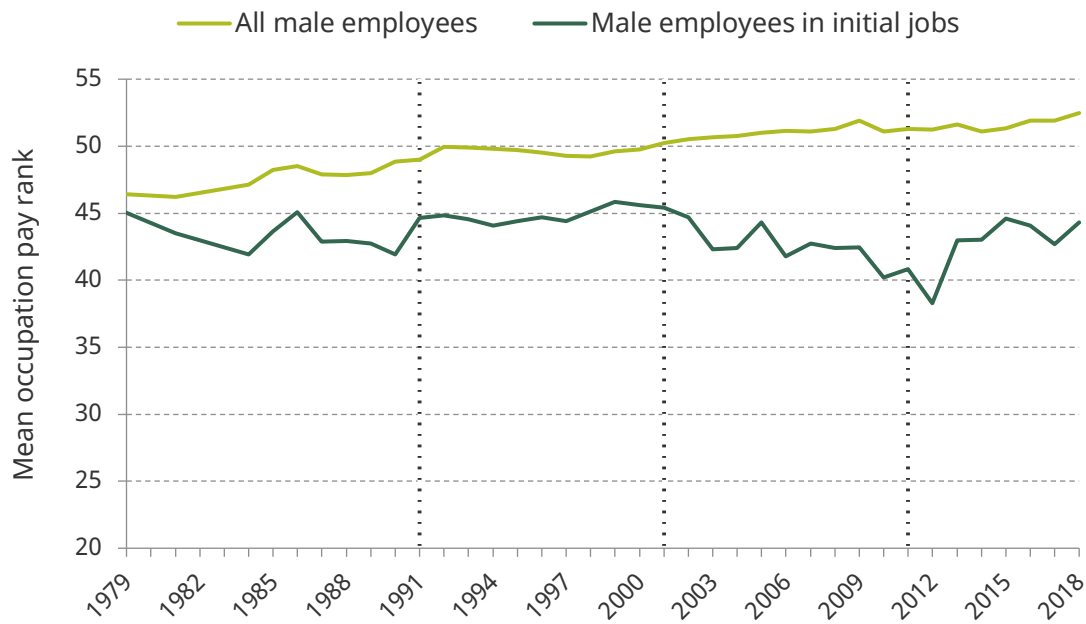
Figure C2. Occupational composition of female employees in the UK



Note: Dashed lines indicate changes in occupational classifications.

Source: Labour Force Survey, 1979–2018.

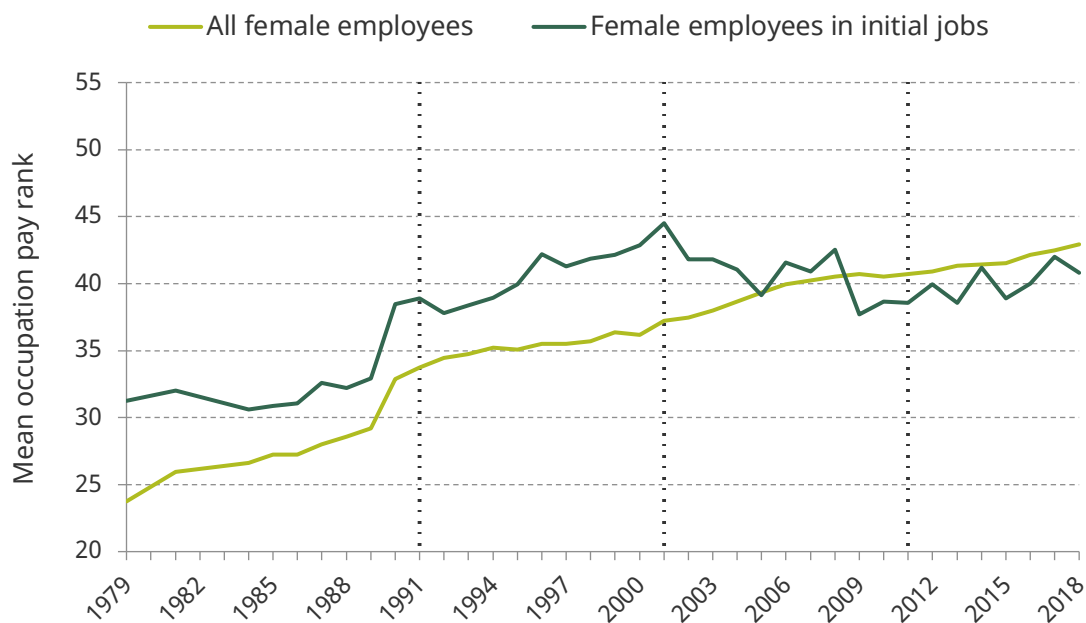
Figure C3. Mean occupation pay rank of male employees in the UK



Note: Dashed lines indicate changes in occupational classifications. We identify initial jobs in the LFS by restricting the sample to full-time male employees aged between 22 and 25 and comparing respondent's age against the age at which they report leaving full-time education.

Source: Labour Force Survey, 1979, 1981 and 1984–2018.

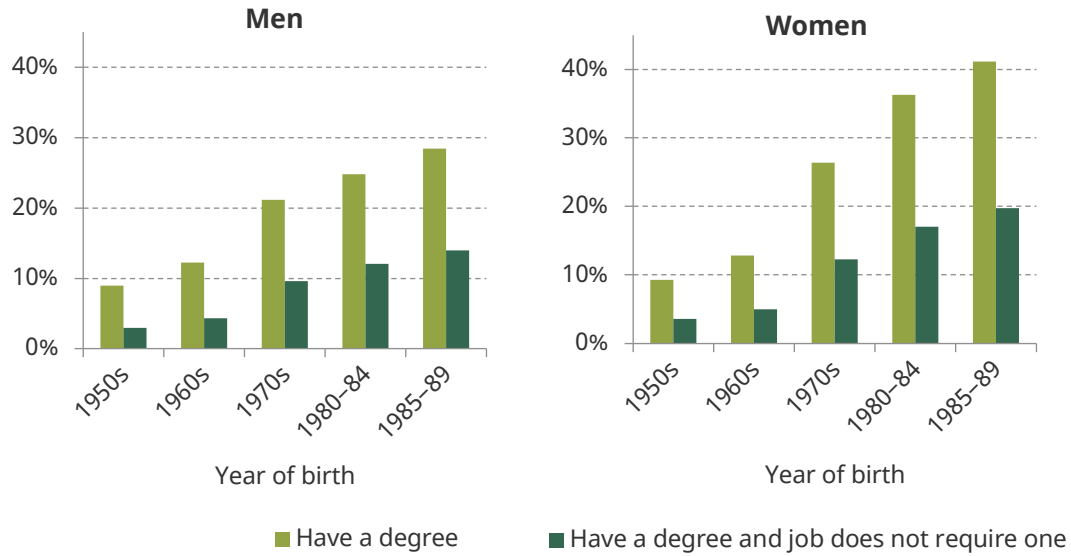
Figure C4. Mean occupation pay rank of female employees in the UK



Note: Dashed lines indicate changes in occupational classifications. We identify initial jobs in the LFS by restricting the sample to full-time female employees aged between 22 and 25 and comparing respondent's age against the age at which they report leaving full-time education.

Source: Labour Force Survey, 1979, 1981 and 1984–2018.

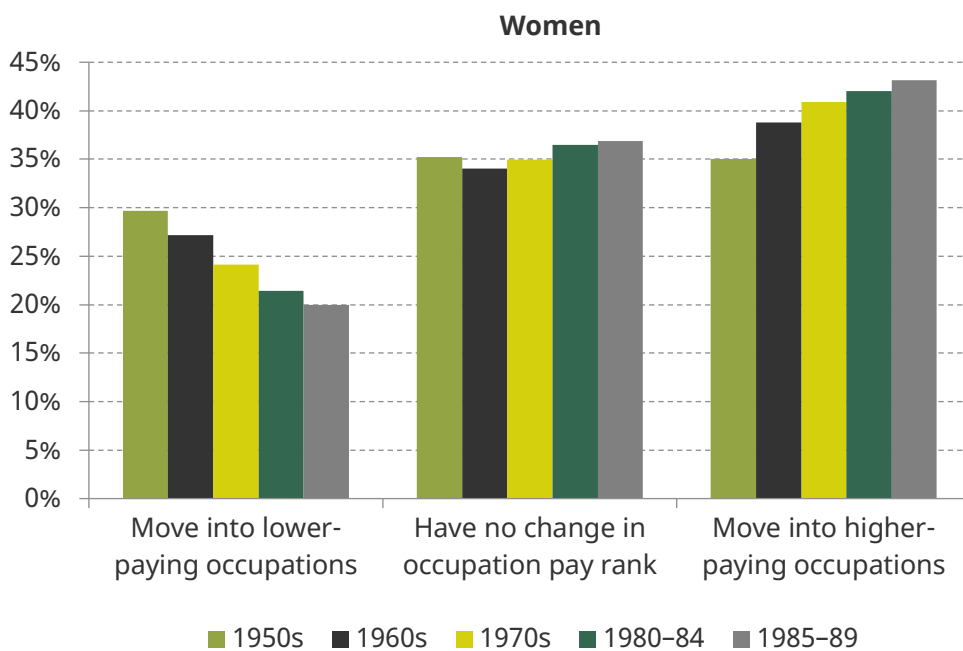
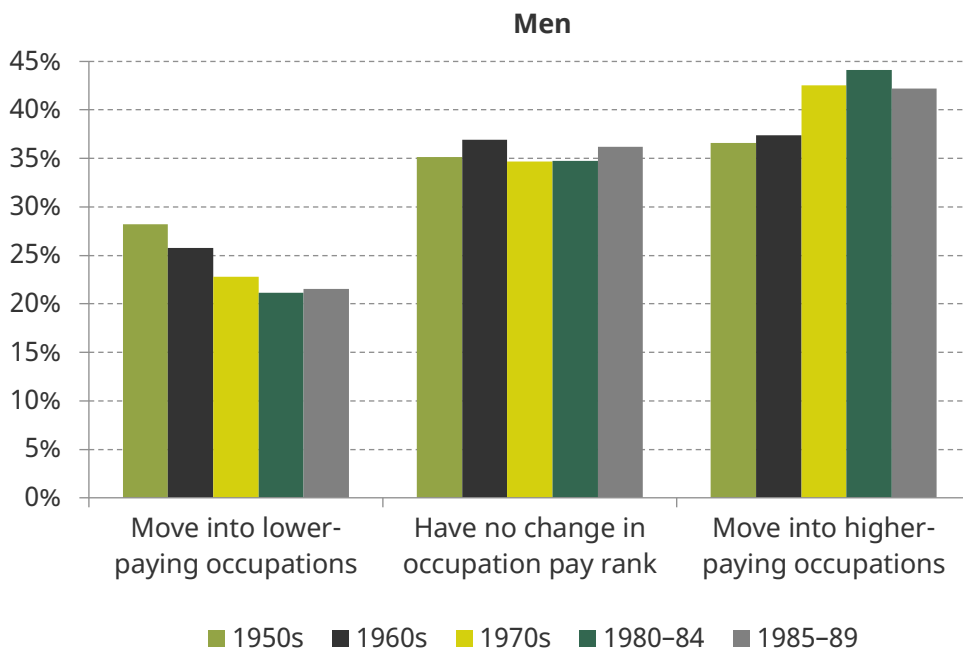
Figure C5. Share of employees aged 22–25 with a degree and share with a degree and in an occupation that does not require one, by cohort and gender



Note: Jobs that do not require degrees are defined as occupations where fewer than 50% of workers in the O*NET data sample report requiring a degree-level qualification to perform their job. Employees aged 22–25 are only included in the sample if they have left full-time education and are working full-time. We do this to exclude jobs that are likely to be prior to someone’s ‘initial job’ (i.e. their first full-time job between the ages of 22 and 25).

Source: Labour Force Survey, 1979, 1981 and 1984–2018; O*NET (version 21.1); Bureau of Labor Statistics employment by detailed occupation (table 1.2, 2016); Bureau of Labor Statistics mapping between US occupation codes and ISCO occupation codes; and ONS mapping between UK occupation codes and ISCO occupation codes.

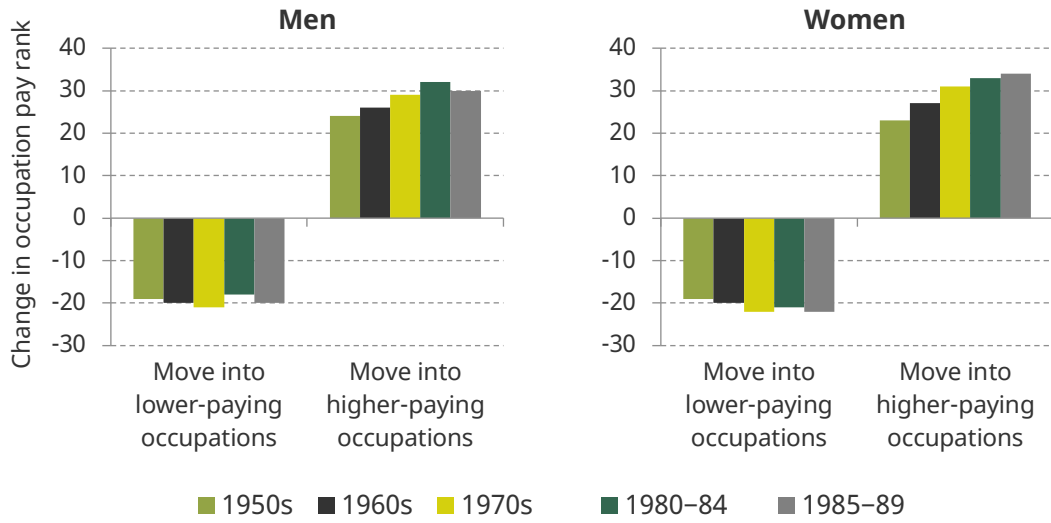
Figure C6. Share of workers, by type of occupation transition five years after initial job, gender and birth cohort



Note: Sample is restricted to people we observe in their initial job and five years later.

Source: New Earnings Survey Panel Dataset, 1975-2016.

Figure C7. Mean change in occupation pay rank between initial job and job five years later, by type of occupation transition, gender and birth cohort



Note: Sample is restricted to people we observe in their initial job and in a different occupation five years later.

Source: New Earnings Survey Panel Dataset, 1975-2016.