

Measuring social origin, cognitive ability and educational attainment in the Avon Longitudinal Study of Parents and Children (ALSPAC)

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1 Introduction

This data note has been prepared for the *Social Origins, Cognitive Ability and Educational Attainment: A Birth Cohort and Life Course Perspective* project. The document will describe the construction of variables using data from the Avon Longitudinal Study of Parents and Children (ALSPAC). (See Boyd et al., 2013.) It will provide information on our focal independent variables – parental class, status, education and income¹, and respondents' early life cognitive ability – as well as the dependent variable(s) of educational attainment, as recorded in the National Pupil Database (NPD). The purpose of the data note is to carefully document the preparatory work undertaken, in the interests of replicability and transparency, and to provide a clear basis for comparison with the approach taken to the construction of similar variables in other datasets used in the project. The distributions of each constructed measure are presented, as well as descriptive analyses of the associations that exist between them.

Section 2 will provide a description of the data. Sections 3–6 describe how social origin measures have been constructed, and present their distributions. Section 7 describes our outcome variable of educational attainment. Section 8 describes the construction of two cognitive ability measures. Section 9 presents the associations between social origin measures, and Section 10 then examines the relationships between educational attainment and each of these. Sections 11 and 12 describe the associations between social origins and cognitive ability, and cognitive ability and educational attainment, respectively.

2 The Avon Longitudinal Study of Parents and Children

The Avon Longitudinal Study of Parents and Children (ALSPAC) is an ongoing birth cohort study, which recruited more than 14,000 pregnant women from the former region of Avon (Bristol) who had an expected delivery date between April 1991 and December 1992. The study was initially designed to investigate environmental, genetic and other effects on children's health outcomes, though it also provides a wealth of information on other background characteristics, cognitive ability and, via linkage with the National Pupil Database (NPD), details on formal educational achievements (Boyd et al., 2013).

The ALSPAC sample was not randomly selected and thus is not representative of the national population, but analyses of respondents' demographic characteristics have shown that it is largely similar to that of the UK as a whole (Bristol 2016). The whole cohort, plus new cases (children invited to join from the age of seven onwards), is comprised of 15,445 children.² 13,761 mothers completed at least one questionnaire (Fraser et al 2012).

ALSPAC have administered a number of surveys; during pregnancy, most women were sent three questionnaires, and over a period of approximately 20 years subsequent to the birth, women were sent around 16 questionnaires. The content of the questionnaires differs across waves, and have not consistently been administered to the full sample or consistently obtained information on the child. The variables described in this data note have been constructed by making the best use of the data that is available across all waves. The overarching aim was to gather information on social origins and cognitive ability as close to age 10 as possible (i.e. the age at which we have measured these in the other datasets we employ in the project); however, ALSPAC has suffered from relatively severe sample attrition, and our success in achieving this aim is thus varied, as we have been required to supplement measures with available information from previous or later waves where the amount of missing information is high. This

¹ Parental income has been constructed, though we do not expect to use this measure in analyses, due to the lack of comparability with measures of income in the other datasets we wish to use.

² Access to information on twins and triplets is not granted by ALSPAC due to concerns relating to confidentiality.

will be described within each section. Further information on the ASLPAC data, the data dictionary and a detailed acknowledgement can be found in Appendix 2.

Table 1 details the amount of missing information on each of our key variables.

Table 1. Missingness on Key Variables

	Per variable: Missing		Cumulative: Missing		Cumulative: Remaining	
	N	%	N	%	N	%
Overall sample					15445	100
Parental education	1717	11	1717	11	13728	89
Parental class	1862	12	484	14	13244	86
Parental status	1862	12	0	14	13244	86
Educational attainment	3361	22	2450	30	10794	70
Cognitive ability (WISC-11)	8825	57	5365	65	5429	35
Cognitive ability (WISC-2)	8098	52	4765	61	6029	39

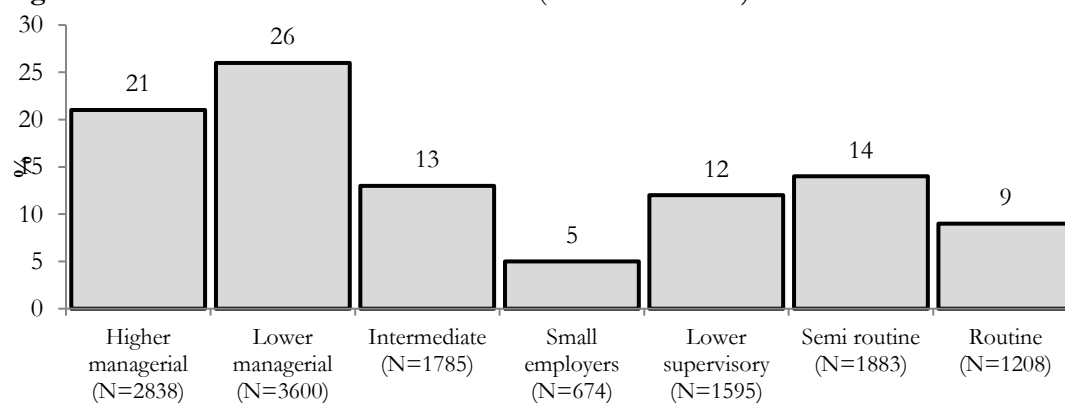
Notes: An additional 408 cases are missing information on parental income (using the larger remaining sample size from WISC-2). Cumulative remaining and missingness is calculated for WISC-11 and WISC-2 separately.

3 Parental Social Class

The reduced approach was used to derive an NS-SEC category for each respondent, which required information on parents' SOC2000 codes and employment status. For mothers, the latest child age at which this information is available is three and for partners it is eight. Partners' information at age eight was prioritised (i.e. this value was taken first, and was not subject to the dominance method), however 11,571 of the original 15,445 cases were missing information on this measure.

SOC2000 codes and employment status information for partners at all earlier waves was then used (ages 3, 2, 1 8 months, 32, 18 and 12 weeks gestation) to create a separate measure. Information at age three was replaced with information at age two if missing, and so on. An NS-SEC class was then determined. The same process was used to derive a value for mothers. The dominance approach (Erikson 1984) was then used to determine the highest NS-SEC value between mothers and partners at age three or below. Reliable and consistent information on full-/part-time work status was not available, so the dominance approach did not incorporate this but did consider partners' class to dominate mothers' class unless the latter was higher in the ordering of the classes as 1, 2, 3–5, 6, 7 (Bukodi and Goldthorpe 2013). Finally, partners' NS-SEC at age eight was taken as the base variable, and then replaced with values from the measure using the dominance approach where values were missing. The distribution of the final parental social-class variable is given in Figure 1.

Figure 1. Distribution of Parental Social Class (Reduced Method)



4 Parental Social Status

Consistent with the approach taken for social class, information taken from partners when children were aged eight was prioritised for the construction of social status, with missing information then replaced with values given at earlier waves where possible. The same was done for mothers, starting with information on SOC codes available at age three. SOC90 codes were used in place of SOC2000 codes.³ These were then used to determine the social status of each parent using the Chan–Goldthorpe (CG) scale and the CAMSIS scale. The dominance approach was then used, taking the highest value between mothers and partners to determine the parental status score. Table 2 gives the means and standard deviations of normalised versions of each measure.

Table 2. Means and Standard Deviations of Mothers’ Partners’ and Parental CG Status Scores (Variables Normalised with Range 0–1)

CG Status Scores			CAMSIS Status Scores		
Mothers	Fathers	Parental	Mothers	Fathers	Parental
0.56 (0.26)	0.44 (0.35)	0.62 (0.28)	0.45 (0.18)	0.46 (0.19)	0.52 (0.18)

Notes:

Sample sizes for each measure (CG and CAMSIS N are identical):
Mothers N=12632; Fathers N=13014; Parental N=13583

Table 3 presents Pearson’s correlations between the various measures of the CG and CAMSIS scale variables described above. These correlations are based on the raw (non-normalised) variables.

Table 3. Pearson’s Correlations: Mothers’, Partners’ and Parental Status Scores (CG and CAMSIS)

	Mother (CG)	Mother (CAM)	Partner (CG)	Partner (CAM)
Mother (CG)	1.00		Partner (CG)	1.00
Mother (CAM)	0.85**	1.00	Partner (CAM)	0.89**
	Mother (CG)	Partner (CG)	Mother (CAM)	Partner (CAM)
Mother (CG)	1.00		Mother (CAM)	1.00
Partner (CG)	0.35**	1.00	Partner (CAM)	0.42**
	Parents (CG)	Parents (CAM)		
Parents (CG)	1.00			
Parents (CAM)	0.86**	1.00		

5 Parental Education

Mothers and their partners were asked for information on their educational qualifications at child ages 13, 8, 5, and 32 and 18 weeks gestation. Each measure (or battery of measures) was recoded to adhere, as closely as possible, to the seven ordered categories of parental education given in Bukodi and Goldthorpe (2013). Following this, a combined measure of parental education was created, which involved allocating cases to each of the categories listed in Table 4 below. This approach required an assumption to be made

³ This is because SOC90 codes are required for conversion to social status scores using the Chan–Goldthorpe scale, and are also most reliable when using the CAMSIS scale.

regarding missing values where educational information was only available for one parent; the assumption applied was that the value of the missing parent is equal to the modal value for partners corresponding to the valid category. Information at age eight was then taken as the base, replaced with age 13 information where this was missing, then again replaced with age five and earlier waves. Proxy interview information was also used where necessary.

Table 4. Distribution of Parental Education (Combined Approach)

	%	N
1. Neither parent has any qualification	4	555
2. One parent has secondary or lower qualification; other parent has no qualification	8	1062
3. Both parents have secondary or lower qualification	37	5053
4. One parent has higher secondary or lower tertiary qualification; other parent has lower qualification	20	2783
5. Both parents have higher secondary or lower tertiary qualification	7	991
6. One parent has degree-level qualification; other parent has lower qualification	14	1897
7. Both parents have degree-level qualifications	10	1387
<i>Missing</i>		1717
<i>Total</i>	100	15445

To allow for meaningful cross-cohort comparisons of educational attainment, it is useful to treat education in relative terms. To this end, scores can be assigned to each category of the composite measure of parental education according to the percentage of parents falling below that level in the cumulative distribution (Bukodi and Goldthorpe 2013). Table 5 presents the distribution of this relative scale.

Table 5. Parental Education: Scores of Relative Scale (% Falling Below Given Level)

7 levels	Parental education: relative scale
1	0.00
2	4.04
3	11.78
4	48.59
5	68.86
6	76.08
7	89.90
Mean	0.44
Standard deviation	0.35

The mean educational level given in Table 5 is calculated by normalising the relative scale variable so that values are within the range 0–1. It should be compared to those found in Bukodi and Goldthorpe (2013) for the earlier cohorts:

1946 cohort: Mean 0.306, Standard deviation 0.371

1958 cohort: Mean 0.363, Standard deviation 0.340

1970 cohort: Mean 0.389, Standard deviation 0.326

6 Parental Income

ALSPAC provides information on family ‘take-home’ income at various child ages. This is given in either weekly or monthly amounts, in various different bands, and is asked of either the mother or the partner

or both, depending on the wave.⁴ Table 6 summarises the availability of information on income across all waves of ALSPAC.

Table 6. Availability of Information on Family Income in ALSPAC

Question wording	Categories	Asked at child ages					
		2y 9m	3y 11m	7y 1m	8y 1m	11y 2m	~19y
Average 'take-home' family income each week (including social benefits, etc.)	<100 100-199 200-299 300-399 400+ DK	Mother	Mother	Mother & Father	Mother & Father		
Average 'take-home' family income each week (including social benefits, etc.)	<120 120-189 190-239 240-289 290-359 360-429	430-479					Mother & Father
Average 'take-home' family income each month (including all earnings, social benefits, tax credits, etc.)	<899 900-1149 1150-1549 1550-1849 1850-2099 2100-2399	2400-2799 2800-3399 3400-4000 4001+ DK					Mother

Since variables were not coded in the same way across waves it is not possible to simply replace missing values with information from earlier (or later) time points (e.g. the top income category at age 11 is £800+, whereas the top category at ages 2–8 is £400+). Information from the variable asked at children's age 11 is used as the base variable, as this is closest to the age used to derive parental income in the other datasets we consider in this study and it also provides more fine-grained categories (10 as opposed to five in the age eight and earlier measures). Information on income is asked of both parents at this age, so the two measures are combined, prioritising answers given by partners as males are more likely to be in work and the assumption is that they are therefore more likely to provide reliable answers. For each case, banded values were then replaced with mid-point values.

Separately, the same approach was used to create measures combining information from both parent questionnaires at ages eight and seven. The mid-point values given at age eight (questionnaires administered in 2001) and age seven (questionnaires administered in 2000) were replaced with these values adjusted to 2004 prices (age 11 questionnaires were administered in 2004).⁵ Finally, information from questionnaires administered at children's age 19 were used; first, mid-points were taken from each band, then these were adjusted from monthly to weekly amounts (/4), and finally these values were deflated from 2012 prices to 2004 prices. Measures from questionnaires administered at children's ages two and three were not used because parents with young children not yet of school age are likely to be in a considerably different financial situation; these measures were therefore considered to provide unreliable information.

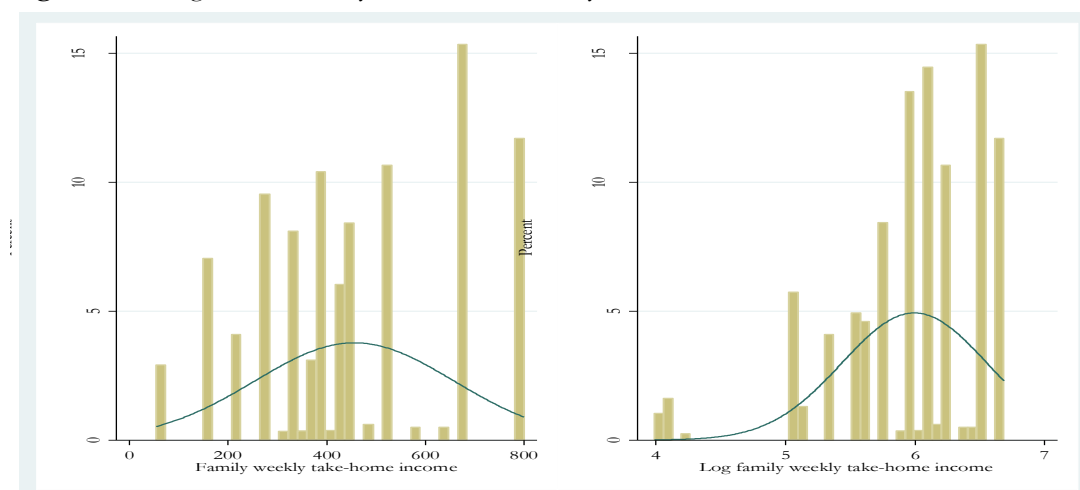
⁴ We do not expect to use the parental income measure in ALSPAC, due to difficulties associated with constructing a measure which is comparable to those used in other datasets.

⁵ Inflation calculator found at:

<http://www.bankofengland.co.uk/education/Pages/resources/inflationtools/calculator/flash/default.aspx>

The base variable (age 11) was replaced with values from other waves where cases had missing information to derive the final weekly take-home family income measure. This final variable is made up of 29 unique income values. 5847 cases have missing information. Figure 2 presents the percentile distribution of this variable, before and after log transformation. The logged variable is negatively skewed due to the large number of cases in the highest income categories.

Figure 2. Histogram of Weekly Take-Home Family Income



The income measure constructed using ALSPAC data has been compared to the measure constructed using LSYPE data. The income variable in LSYPE is comprised of 91 categories and displays a very different distribution.⁶ The ALSPAC variable has a range of 54–800, whereas the LSYPE has a range of 4.5–7693. Despite such a difference, however, the mean income values are broadly comparable: mean gross weekly income in LSYPE is £567.59, compared with mean take-home weekly income in ALSPAC which is £455.85 (both amounts in 2004 prices); assuming a 20% rate of tax,⁷ mean net weekly income in LSYPE would therefore be equal to £454.07.

7 Educational Attainment

The ALSPAC dataset has been linked to the NPD in order to gain information on individuals' educational attainment. Data from the NPD, which provides details of all examinations taken and grades achieved up to and including Key Stage 5, was used to determine individuals' highest qualification attained. The distribution of this variable is given in Table 7 below.

Table 7. Distribution of Respondents' Educational Attainment Up To and Including Key Stage 5

	%	N
1. No qualifications	4	510
2. Below O-level, NVQ 1	15	1735
3. 1–4 O-level passes, NVQ 2	21	2523
4. 5+ O-level passes or 1 A-level pass, NVQ 3	22	2684
5. 2+ A-level passes	38	4632
<i>Missing</i>		3361
<i>Total</i>	100	15445

⁶ The variable in LSYPE also asks for combined information on both parents' incomes, as opposed to family income.

⁷ Tax rates for incomes up to £31,400 in the year 2004/05 were 22% (incomes between £1–2,020 were taxed at 10%). The mean weekly income in LSYPE (£567.59) amounts to an annual income below the highest threshold (~£29,500), so an approximate 20% rate was assumed for this calculation. Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/418669/Table-a2.pdf

A number of other attainment variables were also created. The first determines simply whether the respondent passed the 2+ A-level achievement threshold; the percentage passing this threshold is the same as given in Table 7 above: 38%. The second determines whether the respondent made the transition to further academic education; i.e. the A-level transition. This measure uses a combination of information from the NPD files as well as from the child-completed questionnaires at ages 17.5 and 18. To construct this measure, those who had achieved 2+ A-levels (according to the NPD data) were coded as having made the transition (1), with others coded as not (0). Then, cases with a value of 0 were recoded to having made the transition if they were studying for AS or A-levels or had achieved either of these qualifications at ages 17.5 or 18, according to the answers given to the questionnaires. Finally, further information from the NPD on respondents' number of AS/A-level entries was used to recode cases still taking a value of 0 to having made the A-level transition if they had 1 or more entries at this level. This resulted in a change for 831 cases.

The third variable constructed determined whether cases had made the transition to Key Stage 5 at all, having opted for either the academic or vocational route. This involves starting with the A-level transition measure, and then recoding cases taking a value of 0 to having made the Key Stage 5 transition if there was any information available on these respondents in the Key Stage 5 file (respondents who did not transition to Key Stage 5 at all would not be included). This resulted in a change for a further 1883 cases. Table 8 presents the distributions of each of these measures. 84% of those who made the transition to academic further education successfully completed their course of study (attaining 2 or more A-levels).

Table 8. Distribution of Respondents' Transition Variables

	%	N
2+ A-level threshold		
Passed	38	4623
Did not pass	62	7443
Transition to A-level		
Transitioned	45	5454
Did not transition	55	6612
Transition to Key Stage 5		
Transitioned	61	7337
Did not transition	39	4729

Finally, a measure of performance at the lower secondary level was constructed (i.e. number of A*-C grade GCSEs attained). Table 9 summarises this measure. Note that it is not possible to assess the transition to higher education using ALSPAC data. There is information on qualifications attained at age 20 (which is the latest possible age at which attainment information is available) but most individuals do not start tertiary-level education until age 18-19, so are very unlikely to have completed a (typically three-year) degree by the time they are 20. Further, only ~20% of the initial ALSPAC sample have valid information at this wave.

Table 9. Performance at Lower Secondary Level (Number of A*–C Grade GCSEs Attained)

	%	N
0	19	2241
0.5	1	76
1	7	783
1.5	1	80
2	4	529
2.5	1	85
3	4	443
3.5	1	118
4	4	444
4.5	1	139
5	4	425
5.5	1	157
6	4	489
6.5	2	203
7	5	538
7.5	3	299
8	5	636
8.5	4	453
9	7	885
9.5	5	642
10	8	969
10.5	4	430
11	3	402
11.5	2	192
12	1	149
12.5	1	83
13	1	99
13.5	0	24
14	0	32
14.5	0	7
15	0	7
15.5	0	2
16	0	4
16.5	0	0
17	0	1
<i>Missing</i>		3379
<i>Total</i>	100	15445

8 Cognitive Ability

Measures of cognitive ability are given in ALSPAC as scores on The Wechsler Intelligence Scale for Children (WISC). The WISC is an IQ-yielding intelligence test which can be administered to children between the ages of 6–16. It is the most widely used individual ability test worldwide. The fifth edition is the most current version; but it is the third edition that is used in ALSPAC (WISC-III). Each successive version has been re-normed (made harder) to compensate for the Flynn Effect (Flynn 1987).

It is comprised of a battery of subtests (in ALSPAC 11 are administered)⁸, grouped into general categories of verbal and performance ability. The verbal scales measure general knowledge, language,

⁸ There are in fact 14 scales in the WISC-III. Three are optional (letter-number sequencing, symbol search and object assembly). The first two of these were not conducted by ALSPAC. Also, matrix reasoning was a new test introduced for WISC-III and ALSPAC did not administer this one.

reasoning and memory skills, while the performance scales measure spatial, sequencing and problem-solving skills.

Raw scores on each test were converted to age-scaled scores (Wechsler 1991), which are provided in the ALSPAC dataset. Summing scaled scores in the verbal and performance batteries yield their corresponding IQ scores. Summing and converting these scores is then done to obtain the full-scale IQ score. The approach taken here, guided by the wider psychology literature which tends to advocate for a conceptual distinction between ‘IQ’ and the latent notion of general intelligence ‘g’ (e.g. Colon et al 2002; Deary 2001; Kaufman 1994), is to make use of the scaled subtest information rather than the IQ scores provided (see ‘Cognitive Ability Measures across the Datasets’ document for more information).

Our approach to measuring cognitive ability using the other datasets in our project has been to subject the different components of the tests administered to a principal components analyses (PCA), in order to capture their common variance. Previous studies have used the WISC subtests in a PCA, and have determined that the loadings on the first unrotated factor can be used to adequately represent ‘g’ (e.g. Kaufman 1994; Kamphaus 1993; Roid et al 1993). Two measures have been constructed. The first uses the 11 scaled subtests scores in a PCA, saving scores from the first principal component extracted (named ‘WISC-11’). The second uses the two composite variables (the sum of all verbal and performance subtests), again saving scores from the first principal component extracted (named ‘WISC-2’). Table 10 describes the results of the PCAs and the resulting constructed measures.

Table 10. PCA to Derive Cognitive Ability Measure

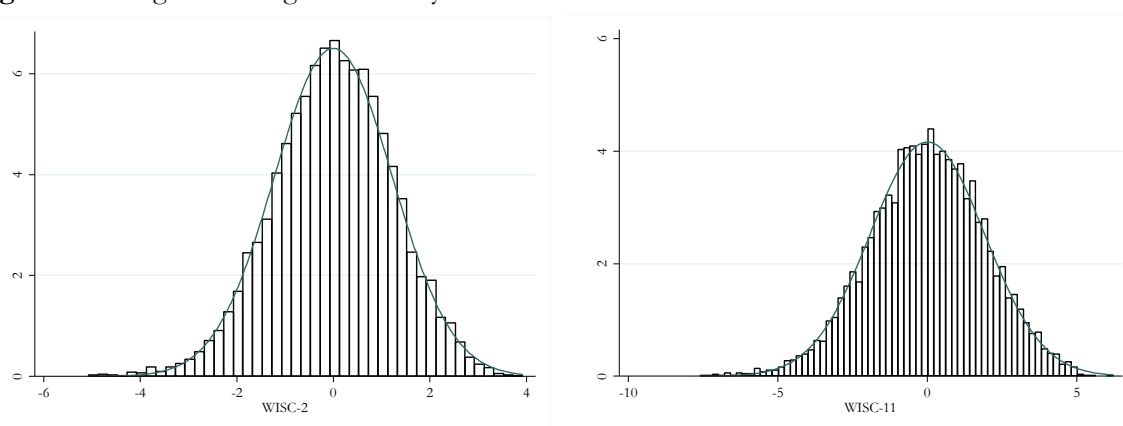
	PCA			New variable				
	Eigenvalue	Loading		% of variance	Min	Max	Mean (SD)	N
		Verbal	Performance					
WISC-11	3.67	--	--	0.33	-7.58	6.13	0.00 (1.92)	6620
WISC-2	1.51	0.71	0.71	0.75	-5.07	3.84	0.00 (1.23)	7347

Notes: Factor loadings are not presented for the WISC-11 measure because there are too many to list

Note that the PCA conducted using the 11 subtests of WISC-III identified two factors: the first with an eigenvalue of 3.67 and the second with an eigenvalue of 1.14. Only values from the first component were saved.

Figure 3 gives the percentile distributions of both measures.

Figure 3. Histogram of Cognitive Ability Measures



9 Associations between Social Origin Measures

This section presents the results from a series of bivariate analyses between social origin measures. First, the parental CG status score variable (original scale) is considered in terms of its distribution across parental social class. See Figure 4 and Table 11.

Figure 4. Boxplot Distribution of Parental CG Status by Parental Class

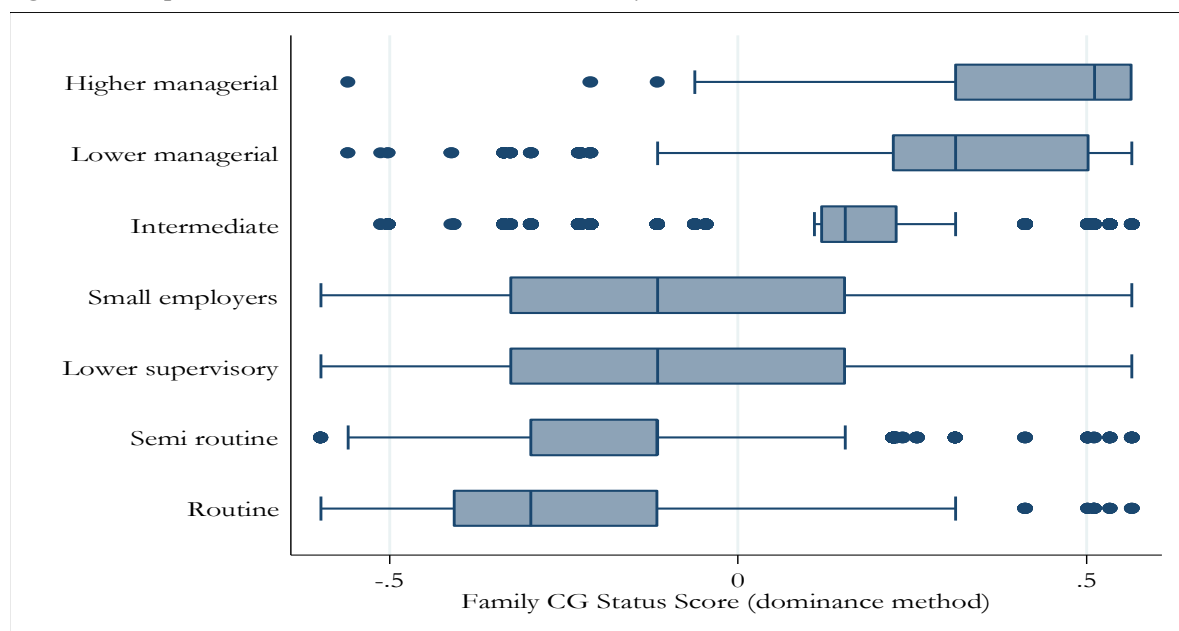


Table 11. Mean CG Status Scores by Parental Class

	CG status scores		
	Mean	SD	N
Higher managerial and professional	0.43	0.16	2838
Lower managerial and professional	0.29	0.21	3600
Intermediate	0.14	0.22	1785
Small employers and own account workers	-0.10	0.29	674
Lower supervisory and technical	-0.10	0.27	1595
Semi routine	-0.14	0.23	1883
Routine	-0.22	0.25	1208

Table 12 gives the results of a one-way analysis of variance, showing that differences between groups are statistically significant and that 53% of the total variance in parental status is explained by parental class.

Table 12. One-way ANOVA: Parental Status by Parental Class

Between groups	Within groups	F	p	%
753.50	662.38	2573.94	0.00	0.53

Table 13 uses the 7-level relative scale parental education variable (normalised with range 0–1) to present the mean level of parental education for each social-class group.

Table 13. Mean Parental Education (7-level Relative Scale, Normalised) by Parental Class

	Parental Education		
	Mean	SD	N
Higher managerial and professional	0.70	0.31	2808
Lower managerial and professional	0.53	0.33	3550
Intermediate	0.37	0.31	1728
Small employers and own account workers	0.26	0.26	665
Lower supervisory and technical	0.29	0.27	1569
Semi routine	0.25	0.26	1791
Routine	0.22	0.24	1133

Table 14 gives the results of a one-way analysis of variance. Differences between groups are statistically significant and 26% of the total variance in parental education is explained by parental class.

Table 14. One-way ANOVA: Parental Education by Parental Class

Between groups	Within groups	F	p	%
410.57	1168.87	774.93	0.00	0.26

A cross-tabulation between parental class and education is given in Table A1 in the appendix which instead uses the categorical parental education variable (relative approach, not normalised). Figure 5 presents a crude summary of the relationship by comparing the proportions of cases for which: (i) neither parent has any qualification, and (ii) both parents have degree-level qualifications, by each social-class group. Among those from the higher managerial class, 28% of respondents have two parents with degree-level qualifications, compared with less than 5% for all other groups outside of the salariat.

Figure 5. Proportion of Cases: (i) Neither Parent has any Qualification, and (ii) Both Parents have Degree-level Qualifications, by Parental Class

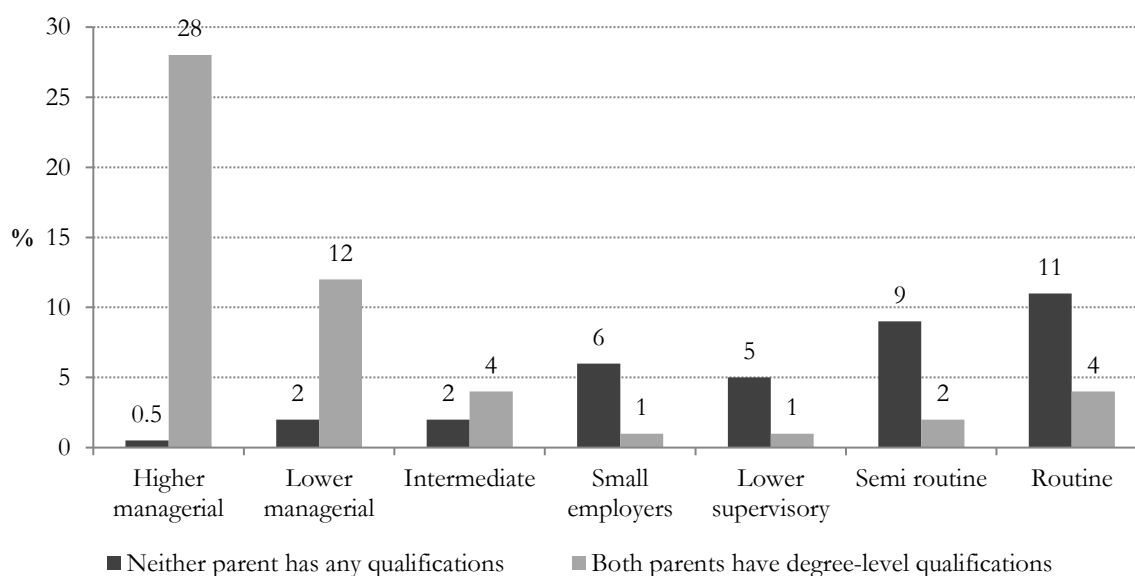


Figure 6 shows how the parental status variable is distributed within each of the seven groups of the categorical parental education variable.

Figure 6. Boxplot Distribution of Parental CG Status Scores (Original Scale) by Parental Education (Relative Scale)

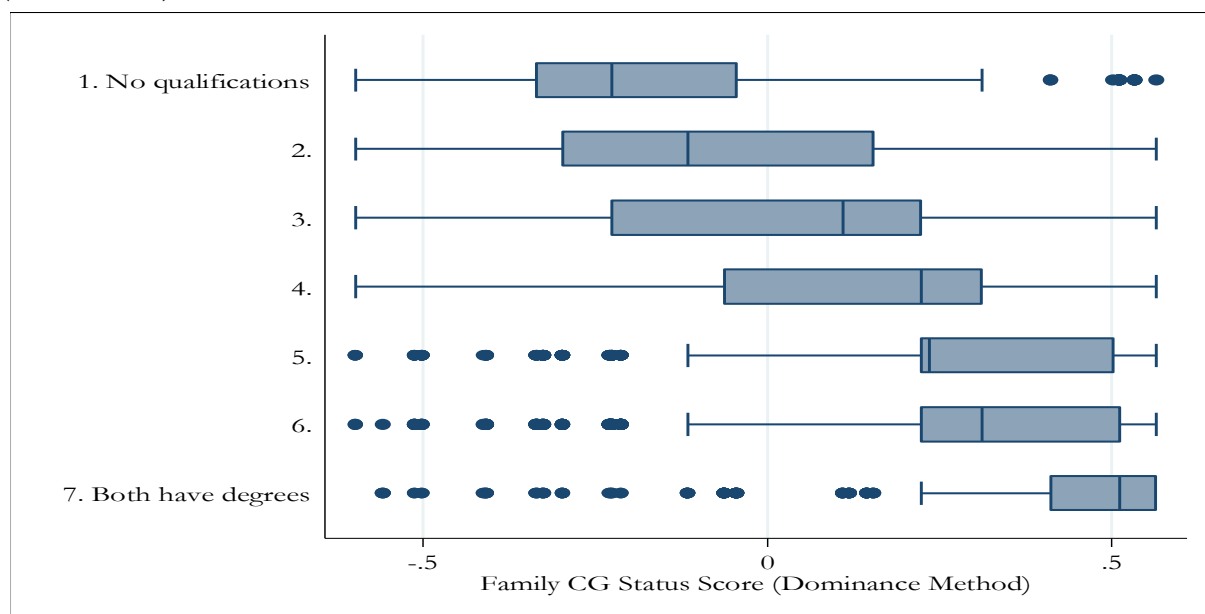


Table 15 presents quintiles of the parental CG status scores against categories of parental education.

Table 15. Cross-tabulation of Parental CG Status Quintiles and Parental Education (Relative Scale)

		Parental education							Total
		1. No qualifications	2.	3.	4.	5.	6.	7. Both degrees	
Parental Social Status	Lowest	282	444	1519	485	88	87	29	2934
		9.61	15.13	51.77	16.53	3.00	2.97	0.99	100.00
		56.29	43.96	31.53	17.75	9.19	4.69	2.12	22.15
	2 nd	121	237	1147	476	101	154	39	2275
		5.32	10.42	50.42	20.92	4.44	6.77	1.71	100.00
		24.15	23.47	23.81	17.42	10.54	8.30	2.85	17.18
	3 rd	56	199	1064	728	251	295	65	2658
		2.11	7.49	40.03	27.39	9.44	11.10	2.45	100.00
		11.18	19.70	22.08	26.64	26.20	15.90	4.75	20.07
	4 th	27	86	671	591	288	693	522	2878
0.94		2.99	23.31	20.54	10.01	24.08	18.14	100.00	
5.39		8.51	13.93	21.62	30.06	37.36	38.13	21.73	
Highest	15	44	417	453	230	626	714	2499	
	0.60	1.76	16.69	18.13	9.20	25.05	28.57	100.00	
	2.99	4.36	8.66	16.58	24.01	33.75	52.15	18.87	
Total	501	1010	4818	2733	958	1855	1369	13244	
	3.78	7.63	36.38	20.64	14.01	14.01	10.34	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Finally, correlations between social origins variables are presented below. Table 16 gives Spearman rank correlations between categorical measures and Table 17 gives Pearson correlations between alternative social origins measures, all of which have been normalised to take values within the range 0–1.

Table 16. Spearman Rank Correlations: Parental Class, Parental CG Status Quintiles and Education (Relative Approach)

	Class	Education	Status
Class	1.00		
Education	0.50**	1.00	
Status	0.72**	0.52**	1.00

Table 17. Pearson Correlations: Parental Class, Parental CG Status (Original Scale) and Education (Relative Approach), 0–1

	Class	Education	Status
Class	1.00		
Education	0.48**	1.00	
Status	0.71**	0.52**	1.00

10 Social Origins and Educational Attainment

This section examines the relationships between each of the social origin measures and our educational attainment outcome variables.

Table 18 shows that higher levels of educational attainment are associated with higher social-class positions. 66% of those from higher managerial and professional backgrounds achieve the highest level of qualification the age of 20, compared with 19% of those from routine backgrounds.

Table 18. Cross-tabulation of Parental Class by Young Person’s Educational Attainment

		Educational attainment					
		1. No quals	2.	3.	4.	5. 2+ A-levels	<i>Total</i>
Social class	Higher managerial	24 1.15 6.08	82 3.95 5.51	215 10.35 9.53	382 18.38 15.32	1375 66.17 31.24	2078 100.00 18.83
	Lower managerial	77 2.70 19.49	237 8.30 15.92	475 16.63 21.05	658 23.03 26.38	1410 49.35 32.04	2857 100.00 25.89
	Intermediate	39 2.58 9.87	183 12.10 12.29	318 21.03 14.09	382 25.26 15.32	590 39.02 13.41	1512 100.00 13.70
	Small employers	27 4.91 6.84	131 23.82 8.80	152 27.64 6.73	125 22.73 5.01	115 20.91 2.61	550 100.00 4.98
	Lower supervisory	57 4.20 14.43	239 17.63 16.05	340 25.07 15.06	352 25.96 14.11	368 27.14 8.36	1356 100.00 12.29
	Semi-routine	76 4.69 19.24	354 21.84 23.77	486 29.98 21.53	367 22.64 14.72	338 20.85 7.68	1621 100.00 14.69
	Routine	95 8.95 24.05	263 24.76 17.66	271 25.52 12.01	228 21.47 9.14	205 19.30 4.66	1062 100.00 9.62
	<i>Total</i>	395 3.58 100.00	1489 13.49 100.00	2257 20.45 100.00	2494 22.60 100.00	4401 39.88 100.00	11036 100.00 100.00

Table 19 considers academic transition measures. Those from the highest social-class backgrounds are shown to transition to further education at substantially higher rates than their peers from lower social-class backgrounds.

Table 19. Transition to Key Stage 5 (Academic Only and Academic and Vocational) by Social Class

	A-level transition		KS5 transition	
	% transitioned	N	% transitioned	N
Higher managerial	72	1503	84	1752
Lower managerial	57	1625	72	2061
Intermediate	47	706	65	981
Small employers	27	147	45	246
Lower supervisory	35	470	52	704
Semi-routine	28	455	45	722
Routine	26	272	41	439

Tables 20 and 21 consider respondents' educational attainment by parents' education.

Table 20. Cross-tabulation of Parental Education (Relative Scale) by Young Person's Educational Attainment

		Educational attainment					Total
		1. No quals	2.	3.	4.	5. 2+ A-levels	
Parental education	1. No qualifications	67	151	130	70	51	469
		14.29	32.20	27.72	14.93	10.87	100.00
		15.69	9.98	5.68	2.80	1.15	4.20
	2.	64	235	276	182	143	900
		7.11	26.11	30.67	20.22	15.89	100.00
		14.99	15.53	12.06	7.29	3.21	8.06
	3.	194	771	1136	1112	1142	4355
		4.45	17.70	26.08	25.53	26.22	100.00
		45.43	50.96	49.65	44.53	25.67	38.98
	4.	54	258	495	602	937	2346
		2.30	11.00	21.10	25.66	39.94	100.00
		12.65	17.05	21.63	24.11	21.07	21.00
	5.	10	41	92	164	477	784
		1.28	5.23	11.73	20.92	60.84	100.00
2.34		2.71	4.02	6.57	10.72	7.02	
6.	28	46	130	256	915	1375	
	2.04	3.35	9.45	18.62	66.55	100.00	
	6.56	3.04	5.68	10.25	20.57	12.31	
7. Both have degrees	10	11	29	111	783	944	
	1.06	1.17	3.07	11.76	82.94	100.00	
	2.34	0.73	1.27	4.45	17.60	8.45	
Total	427	1513	2288	2497	4448	11173	
	3.82	13.54	20.48	22.35	39.81	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	

Table 21. Transition to Key Stage 5 (Academic Only and Academic and Vocational) by Parental Education

	A-level transition		KS5 transition	
	% transitioned	N	% transitioned	N
1. Neither parent has any qualification	16	73	29	137
2.	22	196	39	352
3.	34	1463	52	2247
4.	48	1133	66	1555
5.	68	535	81	637
6.	74	1016	85	1163
7. Both parent have degrees	88	828	94	887

Tables 22 and 23 consider parents' social status.

Table 22. Cross-tabulation of Parental CG Status Quintiles by Young Person's Educational Attainment

		Educational attainment					<i>Total</i>
		1. No quals	2.	3.	4.	5. 2+ A-level passes	
Parental CG Status Quintiles	Lowest	206	677	772	540	456	2651
		7.77	25.54	29.12	20.37	17.20	100.00
		52.15	45.47	34.20	21.65	10.36	24.02
	2 nd	79	335	508	519	526	1967
		4.02	17.03	25.83	26.39	26.74	100.00
		20.00	22.50	22.51	20.81	11.95	17.82
	3 rd	53	252	482	608	905	2300
		2.30	10.96	20.96	26.43	39.35	100.00
		13.42	16.92	21.36	24.38	20.56	20.84
	4 th	39	149	308	501	1300	2297
		1.70	6.49	13.41	21.81	56.60	100.00
		9.87	10.01	13.65	20.09	29.54	20.81
	Highest	18	76	187	326	1214	1821
		0.99	4.17	10.27	17.90	66.67	100.00
4.56		5.10	8.29	13.07	27.58	16.50	
<i>Total</i>	395	1489	2257	2494	4401	11036	
	3.58	13.49	20.45	22.60	39.88	100.00	
	100.00	100.00	100.00	100.00	100.00		

Table 23. Transition to Key Stage 5 (Academic Only and Academic and Vocational) by Parental CG Social Status quintiles

	A-level transition		KS5 transition	
	% transitioned	N	% transitioned	N
Lowest	23	612	39	1026
2 nd	34	669	53	1041
3 rd	47	1089	66	1507
4 th	65	1481	78	1788
Highest	73	1327	85	1543

11 Social Origins and Cognitive Ability

This section examines how each measure of social origins is associated with cognitive ability. Figures 7 and 8 describe how both WISC measures are distributed across categories of social class. Table 24 presents similar information.

Figure 7. Boxplot Distribution of Cognitive Ability (WISC-11) by Parental Class

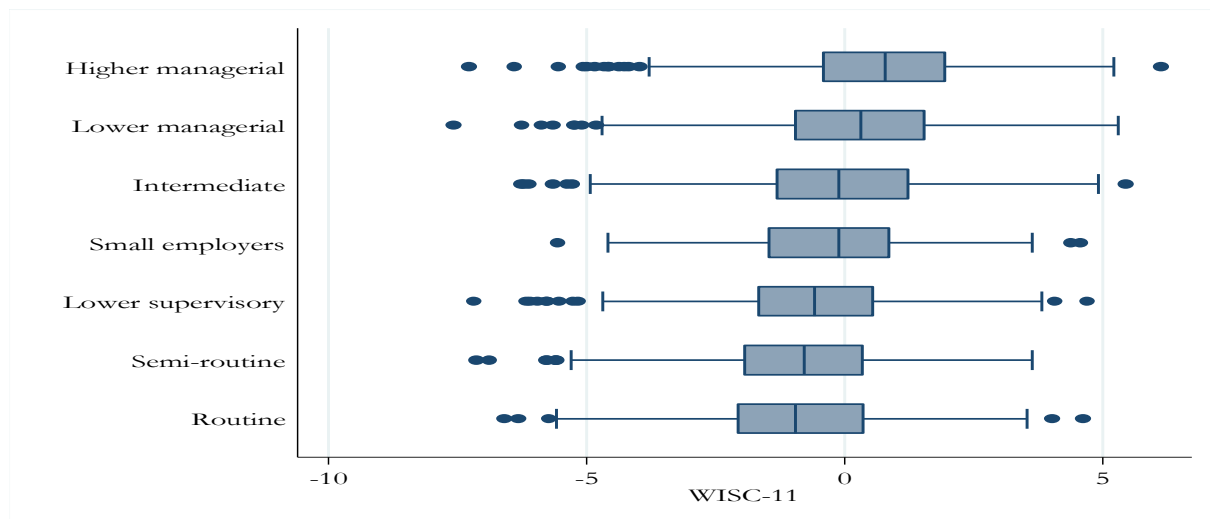


Figure 8. Boxplot Distribution of Cognitive Ability (WISC-2) by Parental Class

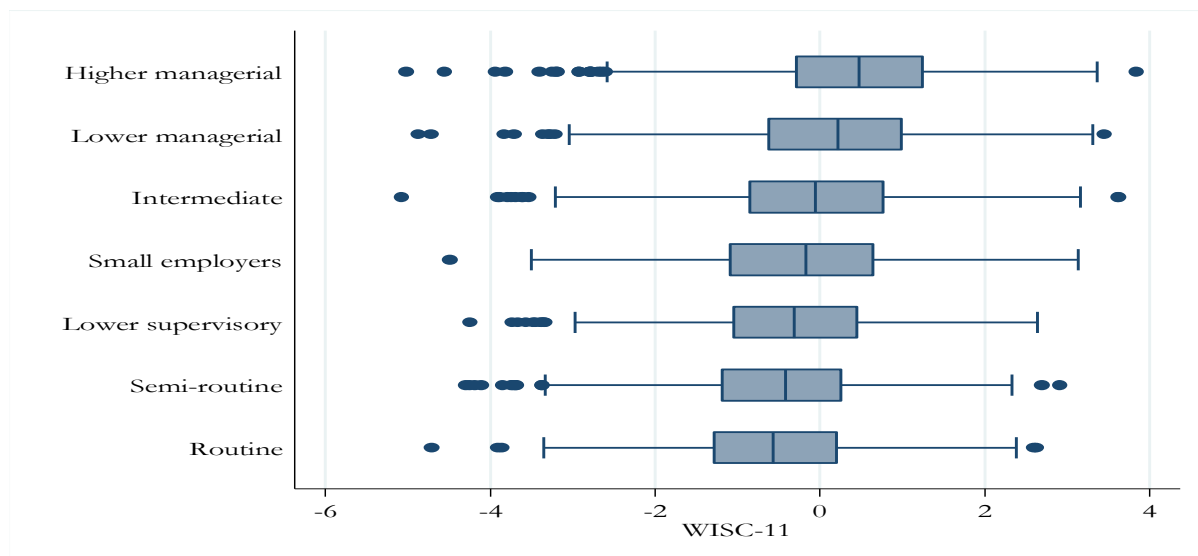


Table 24. Mean Cognitive Ability by Parental Class

	WISC-11			WISC-2		
	Mean	SD	N	Mean	SD	N
Higher managerial	0.75	1.71	1620	0.44	1.17	1779
Lower managerial	0.29	1.83	1839	0.19	1.17	2046
Intermediate	-0.09	1.86	852	-0.08	1.20	952
Small employers	-0.34	1.77	193	-0.27	1.23	223
Lower supervisory	-0.60	1.77	638	-0.33	1.13	712
Semi-routine	-0.81	1.76	739	-0.48	1.15	817
Routine	-0.93	1.83	509	-0.54	1.18	565

Tables 25 and 26 provide similar summaries by quintiles of parental CG social status and parental education, respectively.

Table 25. Mean Cognitive Ability by Parental CG Social Status Quintiles

	WISC-11			WISC-2		
	Mean	SD	N	Mean	SD	N
Lowest	-0.98	1.80	997	-0.58	1.18	1117
2 nd	-0.50	1.77	986	-0.28	1.14	1087
3 rd	-0.21	1.78	1310	-0.11	1.15	1458
4 th	0.49	1.88	1641	0.29	1.20	1827
Highest	0.75	1.76	1456	0.44	1.14	1605

Table 26. Mean Cognitive Ability by Parental Education (Relative Scale)

	WISC-11			WISC-2		
	Mean	SD	N	Mean	SD	N
1. No qualifications	-1.73	1.98	143	-1.06	1.30	157
2.	-1.21	1.73	343	-0.69	1.11	391
3.	-0.56	1.76	2055	-0.34	1.14	2290
4.	-0.16	1.70	1405	-0.08	1.11	1562
5.	0.41	1.76	577	0.27	1.13	633
6.	0.61	1.77	1108	0.36	1.15	1224
7. Both have degrees	1.43	1.69	886	0.85	1.11	973

12 Cognitive Ability and Educational Attainment

This section will examine the association between cognitive ability and educational attainment. Table 27 presents mean cognitive ability scores across categories of highest educational qualification achieved. Table 28 presents mean scores across attainment thresholds.

Table 27. Mean Cognitive Ability by Educational Attainment

	WISC-11			WISC-2		
	Mean	SD	N	Mean	SD	N
1. No qualifications	-2.22	1.86	100	-1.45	1.31	114
2.	-2.42	1.66	474	-1.46	1.10	552
3.	-1.29	1.39	950	-0.75	0.93	1058
4.	-0.14	1.44	1286	-0.06	0.94	1441
5. 2+ A-levels	0.85	1.60	2841	0.52	1.04	3112

Table 28. Mean Cognitive Ability by Educational Attainment Thresholds at Age 20

	WISC-11		WISC-2	
	Mean (SD)	N	Mean (SD)	N
Threshold i.				
1	-2.22 (1.86)	100	-1.45 (1.31)	114
2-5	-0.03 (1.87)	5551	-0.01 (1.20)	6163
Threshold ii.				
1-2	-2.39 (1.70)	574	-1.46 (1.14)	666
3-5	0.20 (1.73)	5077	0.13 (1.11)	5611
Threshold iii.				
1-3	-1.70 (1.60)	1524	-1.02 (1.07)	1724
4-5	0.54 (1.62)	4127	0.34 (1.05)	4553
Threshold iv.				
1-4	-0.99 (1.72)	2810	-0.58 (1.12)	3165
5	0.85 (1.60)	2841	0.52 (1.04)	3112

Table 29 examines mean cognitive ability by transition to A-level and Key Stage 5.

Table 29. Mean Cognitive Ability by Educational Transitions

	A-level				Key Stage 5			
	WISC-11		WISC-2		WISC-11		WISC-2	
	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
Did transition	0.67 (1.65)	3337	0.41 (1.07)	3656	0.43 (1.71)	4146	0.27 (1.10)	4558
Did not transition	-1.12 (1.72)	2314	-0.66 (1.13)	2621	-1.42 (1.71)	1505	-0.86 (1.13)	1719

Appendix

Table A1. Cross-tabulation between Parental Social Class and Parental Education (Relative Scale)

		Parental education							<i>Total</i>
		1. No quals	2.	3.	4.	5.	6.	7. Both degrees	
Parental social class	Higher managerial	15 0.53 2.99	42 1.50 4.16	443 15.78 9.19	468 16.67 17.12	262 9.33 27.35	793 28.24 42.75	785 27.96 57.34	2808 100.00 21.20
	Lower managerial	66 1.86 13.17	152 4.28 15.05	982 27.66 20.38	864 24.34 31.61	390 10.99 40.71	656 18.48 35.36	440 12.39 32.14	3550 100.00 26.80
	Intermediate	40 2.31 7.98	128 7.41 12.67	786 45.49 16.31	409 23.67 14.97	109 6.31 11.38	180 10.42 9.70	76 4.40 5.55	1728 100.00 13.05
	Small employers	41 6.17 8.18	89 13.38 8.81	342 51.43 7.10	131 19.70 4.79	18 2.71 1.88	37 5.56 1.99	7 1.05 0.51	665 100.00 5.02
	Lower supervisory	74 4.72 14.77	166 10.58 16.44	778 49.59 16.15	374 23.84 13.68	89 5.67 9.29	70 4.46 3.77	18 1.15 1.31	1569 100.00 11.85
	Semi routine	152 8.49 30.34	241 13.46 23.86	922 51.48 19.14	295 16.47 10.79	65 3.63 6.78	84 4.69 4.53	32 1.79 2.34	1791 100.00 13.52
	Routine	113 9.97 22.55	192 16.95 19.01	565 49.87 11.73	192 16.95 7.03	25 2.21 2.61	35 3.09 1.89	11 0.97 0.80	1133 100.00 8.55
	<i>Total</i>	501 3.78 100.00	1010 7.63 100.00	4818 36.38 100.00	2733 20.64 100.00	958 7.23 100.00	1855 14.01 100.00	1369 10.34 100.00	13244 100.00 100.00

ALSPAC Study description

ALSPAC recruited 14,541 pregnant women resident in Avon, UK with expected dates of delivery 1st April 1991 to 31st December 1992. 14,541 is the initial number of pregnancies for which the mother enrolled in the ALSPAC study and had either returned at least one questionnaire or attended a “Children in Focus” clinic by 19/07/99. Of these initial pregnancies, there was a total of 14,676 fetuses, resulting in 14,062 live births and 13,988 children who were alive at 1 year of age.

When the oldest children were approximately 7 years of age, an attempt was made to bolster the initial sample with eligible cases who had failed to join the study originally. As a result, when considering variables collected from the age of seven onwards (and potentially abstracted from obstetric notes) there are data available for more than the 14,541 pregnancies mentioned above.

The number of new pregnancies not in the initial sample (known as Phase I enrolment) that are currently represented on the built files and reflecting enrolment status at the age of 18 is 706 (452 and 254 recruited during Phases II and III respectively), resulting in an additional 713 children being enrolled. The phases of enrolment are described in more detail in the cohort profile paper which should be used for referencing purposes:

The total sample size for analyses using any data collected after the age of seven is therefore 15,247 pregnancies, resulting in 15,458 fetuses. Of this total sample of 15,458 fetuses, 14,775 were live births and 14,701 were alive at 1 year of age. Open v.25 17th August 2016

A 10% sample of the ALSPAC cohort, known as the Children in Focus (CiF) group, attended clinics at the University of Bristol at various time intervals between 4 to 61 months of age. The CiF group were chosen at random from the last 6 months of ALSPAC births (1432 families attended at least one clinic). Excluded were those mothers who had moved out of the area or were lost to follow-up, and those partaking in another study of infant development in Avon.

ALSPAC data dictionary

The ALSPAC website contains details of all the data that is available through a fully searchable data dictionary: <http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary>.

Ethics

Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees.

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