Educational aspirations and attitudes over the business cycle

Tina Rampino
Institute for Social and Economic Research
University of Essex

Mark Taylor
Institute for Social and Economic Research
University of Essex

INSTITUTE FOR SOCIAL
& ECONOMIC RESEARCH

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Non-technical summary

In recent years, the policy debate in the UK has increasingly focused on young people's educational aspirations, attitudes and expectations, as fostering positive aspirations towards learning, particularly among children in economically disadvantaged groups, is expected to raise educational attainment among these groups and so have longer-term implications for productivity, poverty, wage and income inequality and intergenerational mobility. Policy interventions focused on changing expectations and aspirations are also likely to be more cost-effective than seeking to directly improve cognitive development itself. In this paper we identify the extent to which young people's attitudes to education, and their educational aspirations, are sensitive to the prevailing economic climate.

We might expect the macroeconomic climate to be an important determinant of aspirations and attitudes, and there are two mechanisms through which we might expect this effect to emerge. First educational aspirations and attitudes may become more positive if young people perceive that an economic downturn reduces the opportunity costs of educational attainment (i.e. expected wages from the labour market), or provides an incentive for them to accumulate the skills necessary to succeed in a weak labour market. Alternatively, if an economic downturn is perceived as reducing the expected future returns to investing in skills, then a recession will have a negative impact on the educational aspirations of young people. Which of these dominates is an empirical question, which has implications for the long-term impacts of a recession. If an economic downturn has a negative impact on educational attitudes and aspirations, then the short-term costs of a recession are likely to persist over time for a particular cohort as these translate into lower educational attainment and a reduction in life-chances.

Our empirical analysis draws on data from the British Youth Panel component of the British Household Panel Survey. Since 1994, all children aged 11–15 in BHPS sampled households have completed a self-completion questionnaire, which a range of information on, for example, children's use of leisure time, their health and health-related behaviour, subjective well-being, aspirations and attitudes towards education and school, and their relationship with their families and peers. The BYP is essentially a rotating panel, as a core group remains within the panel for a maximum of five waves while each year the 16-year olds move into the adult survey and are replaced by a new cohort of 11 year-olds.

We find a positive and statistically significant correlation between the unemployment rate and educational attitudes and aspirations in the raw data, suggesting that high unemployment reduces the opportunity cost of education and results in a more positive view of schooling among young people. However this largely disappears when controlling for a range of child and family-specific factors plus unobserved differences between children using panel data estimation techniques. Further analysis reveals that the positive impact of high unemployment on educational attitudes persists among children with highly educated parents and parents who themselves hold positive attitudes to education, but is less apparent among children with low educated parents and parents with less positive views towards education. This suggests that negative economic shocks exacerbate differences in educational aspirations and motivations by socioeconomic status, and are therefore likely to have longer-lasting impacts on social inequality and immobility.

Educational aspirations and attitudes over the business cycle

Tina Rampino
Institute for Social and Economic Research
University of Essex

and

Mark Taylor[*]
Institute for Social and Economic Research
University of Essex

Abstract: We use data from the youth component of the British Household Panel Survey to examine how educational attitudes and aspirations among 11-15 year olds vary across the business cycle. We find that the impact of the local unemployment rate on children's attitudes and aspirations varies significantly with parental education level and parental attitudes to education – children from highly educated families react more positively to low labour demand those from less educated families. Therefore the aspirations of children from low socioeconomic status backgrounds are more adversely affected by recessions than those from higher status backgrounds, representing a barrier to social mobility for a generation.

[*] Corresponding author: Professor Mark Taylor, Institute for Social and Economic Research, University of Essex, Colchester, Essex, UK, CO4 3SQ.
Email: taylm@essex.ac.uk. Tel: +44(0)1206 873553; Fax: +44(0)1206 873151.

Educational aspirations and attitudes over the business cycle

1. Introduction

In recent years, the policy debate in the UK has increasingly focused on young people's educational aspirations, attitudes and expectations in order to raise performance and attainment at school (see, for example, Cabinet Office 2011). Differences in educational attainment by socio-economic status are large, with children from less advantaged backgrounds on average performing less well than their more advantaged peers (Shavit and Blossfeld 1993; Feinstein 2003, 2004). This creates barriers to social mobility, as educational disadvantage persists across generations. Fostering positive aspirations towards learning, particularly among children in economically disadvantaged groups, is expected to raise educational attainment among these groups and so have longer-term implications for productivity, poverty, wage and income inequality and intergenerational mobility. Policy interventions focused on changing expectations and aspirations are also likely to be more cost-effective than seeking to directly improve cognitive development itself (Cunha and Heckman 2007; Cunha et al. 2010), although there is limited evidence that such interventions have been successful (see Cummings et al. 2012; Gorard et al. 2012). Empirical evidence indicates a positive correlation between aspirations, expectations and attainment, although the extent to which this is a causal relationship is still debated (Chowdry et al. 2011; Goodman et al. 2011; Gregg and Washbrook 2011; Jacob and Wilder 2010; Khoo and Ainley 2005; Strand 2007).

Our contribution is to examine the extent to which educational aspirations and attitudes are affected by the macroeconomic climate. We might expect the macroeconomic climate to be important given research suggests that aspirations and attitudes are at least partly determined by young people's perceived external opportunities (Archer and Yamashita 2003). There are two mechanisms through which we might expect such an effect to emerge, which operate in different directions. First educational aspirations and attitudes may become more positive if young people perceive that an economic downturn reduces the opportunity costs of educational attainment (i.e. expected wages from the labour market), or provides an incentive for them to accumulate the skills necessary to succeed in a weak labour market. Alternatively, if an economic downturn is perceived as reducing the expected future returns to investing in skills, then a recession will have a negative impact on the educational aspirations of young

people. Which of these dominates is an empirical question, which has implications for the long-term impacts of a recession. If an economic downturn has a negative impact on educational attitudes and aspirations, then the short-term costs of a recession are likely to persist over time for a particular cohort as these translate into lower educational attainment and a reduction in life-chances.

This research is related to two strands of literature. The first is concerned with the impacts of economic recessions on individual behaviour and long-term outcomes, while the second is concerned with the drivers of children's educational attitudes and aspirations. Previous research finds support for the discouraged worker effect, indicating that a weaker youth labour market (typically captured by the local youth unemployment rate) increases participation in post-compulsory education (Clark 2011; McVicar and Rice 2001; Whitfield and Wilson 1991), although the size of the effect varies by gender and educational attainment (Meschi et al. 2011; Rice 1999). Furthermore, there is evidence of large and persistent wage penalties caused by leaving school during periods of high unemployment (Brunner and Kuhn 2010; Kahn 2010; Oreopolous et al 2008; Stevens 2008), suggesting that negative, short-term labour market shocks can have long-term consequences for young people.

Investigating drivers of children's attitudes and aspirations is important for a number of reasons. The psychology literature indicates that people tend to attain higher levels of achievement at a particular activity if they value it more (Jessor and Jessor 1977; Wigfield and Eccles 2000). Consistent with this, clear positive correlations emerge between educational attitudes, aspirations and expectations of children and their subsequent attainment and education-related behaviour (Andrews and Bradley 1997; Chowdry et al. 2011; Duncan et al. 1972; Khoo and Ainley 2005; Sewell et al. 1980; Strand 2007). In addition, there is evidence that having positive educational attitudes and aspirations reduce engagement in deviant and antisocial behaviours (Hirschi 1969; Leblanc 1994; Torstensen 1990), and with a range of other later life outcomes such as benefit receipt and early and lone parenthood among women (Edwards et al. 2001; Moore et al. 1995; Plotnick 1992). There are problems in assigning causality as there are likely to be a range of unobservable factors that affect attitudes, aspirations and expectations and the outcomes of interest, but also because attitudes are likely to be affected by previous academic performance and ability (Bond and Saunders 1999; Goodman and Gregg 2010; Gorard et al. 2012; Gregg and Washbrook 2011; Jacob and Wilder 2010; Zafar 2009).

Nevertheless changes in factors which influence children's perceptions of the importance of schooling could have consequences for their academic performance and subsequent life chances (Gutman and Akerman 2008). This is significant as previous research has demonstrated that children's attitudes to schooling and education vary by the socioeconomic status of their parents. In particular, children from low income families have lower aspirations and attitudes than their peers from high income families (Chowdry et al. 2011; Goodman and Gregg 2010; Gregg and Washbrook 2011; Schoon and Parsons 2002; Willitts et al. 2005), and this contributes to the persistence in advantage across generations (Chowdry et al. 2011; Crawford et al. 2011). For example Chowdry et al. (2011) find that differences in educational attitudes of children and their parents explain 25% of the socio-economic gap in attainment at age 16, while Gregg and Washbrook (2011) conclude that substantial proportions of the educational attainment gap by socioeconomic status can be explained by aspirations and expectations of parents and children. Differences by socioeconomic background may reflect different opportunities and environments, with differing access to learning resources, role models, occupational knowledge and informal networks (Keller and Zavalloni 1965; Schoon 2006; Vondracek et al. 1986).

We contribute to these literatures by identifying the impact of the macroeconomic climate on children's educational attitudes and aspirations.[1] We distinguish explicitly between aspirations, defined in terms of whether young people would like to participate in further or higher education, and attitudes which are defined in terms of the importance placed by young people on schooling. Given the associations that have emerged in the literature between educational attitudes, aspirations and expectations and subsequent attainment, any negative effect associated with a poor macroeconomic climate is likely to have lasting consequences on a young person's educational outcomes and employment opportunities in the future. We find a positive and statistically significant correlation between the unemployment rate and educational attitudes and aspirations in the raw data, suggesting that high unemployment reduces the opportunity cost of education and results in a more positive view of schooling among young people. However this largely disappears when conditioning on a range of child and family-specific factors plus time-invariant individual-specific unobservables. Further

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[1] We focus on educational aspirations and attitudes rather than on participation in socially undesirable behaviours explicitly for two reasons. Firstly because investment in education is fundamental to subsequent job

analysis reveals that the positive impact of high unemployment on educational attitudes persists among children with highly educated parents and parents who themselves hold positive attitudes to education, but is less apparent among children with low educated parents and parents with less positive views towards education. This suggests that negative economic shocks exacerbate differences in educational aspirations and motivations by socioeconomic status, and are therefore likely to have longer-lasting impacts on social inequality and immobility.

The rest of the paper is organised as follows. We next introduce the data used in the research, the British Youth Panel component of the British Household Panel Survey, and describe the nature and patterns relating to the key variables of interest. Section 3 describes the estimation procedures adopted, and the specification of the models estimated, while Section 4 provides a discussion of the benchmark results and Section 5 discusses some extensions to the core analysis. The final section summarises and concludes.

2. Data and descriptive statistics

Data

We investigate the relationships between educational attitudes and aspirations and the business cycle using data from the British Household Panel Survey (BHPS), and the British Youth Panel in particular. The BHPS is a panel survey which since 1991 has (re)interviewed the same individuals annually, with interviews generally taking place between October and December of each year. The first wave was designed as a nationally representative random sample of the population of Great Britain living in private households in 1991. These original respondents and any adult co-residents have been followed and interviewed at annual intervals ever since, with information collected about their incomes, labour market status and job characteristics (if employed), social and parental background, housing tenure and conditions, household composition, education, health and many other aspects of their lives. The BHPS is unique among British datasets in having annual snapshots of people's lives over a relatively long period. Since 2010, the BHPS sample has been incorporated into the larger UK Household Longitudinal Survey (UKHLS), which allows continued analysis of these same individuals although with the caveats that no interviews of BHPS respondents took

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and life chances, and secondly because of issues relating to data reliability and sample sizes when focusing on risky and anti-social behaviours.

place in 2009 (the first year of UKHLS) and there is some inconsistency in the questions asked.

Since 1994, all children aged 11–15 in sample households have completed a self-completion questionnaire – known as the British Youth Panel (BYP).[2] This collects a range of information on, for example, children's use of leisure time, their health and health-related behaviour, subjective well-being, aspirations and attitudes towards education and school, and their relationship with their families and peers. Initially, questions were recorded onto tape and children were supplied with a personal stereo and answer booklets, later replaced with laptop computers. This has two advantages: it helped to ensure that responses were confidential as other household members would not be able to interpret the answers from the answer booklets alone (the answer booklets contain only the response categories and not the questions themselves), and it also allows the child to respond to the questions at their own pace. The full range of household information from the main adult survey is available, making this a particular rich source of data for the analysis of children's behaviour. The BYP is essentially a rotating panel, as a core group remains within the panel for a maximum of five waves while each year the 16-year olds move into the adult survey and are replaced by a new cohort of 11 year-olds. Annual sample sizes vary across years, ranging from about 750 young people between waves 4 (1994) and 7 (1997), 950 in waves 8 (1998) and 9 (1999), and 1200-1400 from wave 10 (2000) onwards.[3] Year-on-year response rates among young people have exceeded 90% (see, for example, Taylor et al. 2010).

We draw on responses to four questions in particular. To capture children's attitudes to school and education more generally, we use responses to the questions: "How much does it mean to you to do well at school? Does it mean very little, a bit, quite a lot, a great deal?" and "How important do you think it is for you to get your GCSE exams? (Standard Grades in Scotland). Is it not at all important, not very important, important, very important?" The former was asked of all 11 to 15 year olds from waves 5 (1995) to 18 (2008), while the latter was asked of all 11 to 15 year olds between waves 12 (2002) and 18 (2008) as well as 2010

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[2] Those 15-year olds turning 16 by 1 December in the current wave are interviewed as adults rather than in the youth survey, while 10-year olds turning 11 by this date are included. More information about the BYP is available at: http://www.iser.essex.ac.uk/bhps/documentation.

[3] These variations in sample size are the result of the changing nature of the BHPS sample. Waves 8 and 9 include the low income sample from the British component of the European Community Household Panel (ECHP), while waves 10 onwards include the Wales, Scotland and Northern Ireland boost samples. All our descriptive statistics are weighted to allow for the changing sample composition.

as part of the UKHLS survey.[4] We capture children's aspirations for participating in further or higher education through their responses to the questions "Do you want to leave school when you are 16, or do you plan to go on to sixth form or college?" and "Would you like to go on to do further full-time education at a college or University after you finish school?"[5] The former was asked of all 11-15 year olds between wave 4 (1994) and wave 18 (2008) and 2010, while the latter was asked of children aged 13 to 15 between waves 12 (2002) and 18 (2008) and 2010.[6]

Our focus is on the impact of business cycle effects on these aspirations and attitudes. We capture the business cycle using regional unemployment rates derived from the UK Labour Force Survey (LFS). The LFS is a nationally representative household survey which collects data on a range of individual and household characteristics, focussing in particular on employment status, education, and job characteristics. It has been collected quarterly since 1992, and we pool quarterly data within calendar years to calculate annual gender-specific ILO unemployment rates among young people aged 16-24 in each metropolitan region of the UK in each year.[7] We match these to the BYP data by gender, region and year of interview.

The BYP data have several advantages for investigating the sensitivity of young people's educational attitudes and aspirations to business cycle effects. Firstly they collect a number of measures relating to different aspects of the educational process directly from young people in a way that is likely to minimise biases in responses caused by factors related to the interview process. Secondly, they collect rich contextual information from the child, the parents, and the household, allowing a range of factors to be taken into account in identifying the effects of interest. Thirdly, they are panel data, allowing the use of panel data estimation methods which are able to incorporate unobserved individual-specific or family-specific effects which may otherwise bias the effects of interest. This is important given that previous

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[4] GCSEs are General Certificates of Secondary Education, which are academic qualifications awarded at age 16 in a specified subject, generally taken in a number of subjects. Performance in GCSEs largely determines the post-compulsory schooling opportunities available to the child – with attaining five GCSEs of grade A-C perceived as a key indicator of academic ability.
[5] Age 16 is the youngest age at which children in the UK are legally entitled to leave school.
[6] The wording of the question about leaving school at age 16 changed in the UKHLS in 2010, so that it asked: "At the moment, young people can leave school at 16. What would you most like to do when you are 16? Get a full-time job? Study full time? Get a job and study? Do something else? Don't know?" We include those who respond get a full-time job, get a job and study and do something else as wanting to leave school at age 16. Our main results are robust to excluding this year of data from the analysis.
[7] There are 18 metropolitan regions in the UK. Within the LFS data, there are between 2,000 and 6,000 individuals unemployed in each quarter.

research has suggested that (unobserved) personality traits are correlated with academic motivation and achievements (Child 1989; De Raaad and Schouwenberg 1996; Entwistle 1972; Heaven 1990; Heaven et al. 2002). Fourthly, the 20-year period covered by the data allow us to identify average effects across multiple cohorts of children rather than for a single cohort. Finally, they cover a period that spans the business cycle – from the tail end of the previous recessionary period in the early 1990s, through the subsequent economic boom of the late 1990s and early 2000s, and back into the recent 'Great Recession'. This allows us to exploit variation both across geographical areas and over time to identify the effects of interest.[8]

The drawbacks of these data are that we do not have any information on revealed academic ability, and previous research has found a strong correlation between previous and subsequent educational attainment (e.g. Chowdry et al. 2011) and between prior attainment and future expectations, aspirations and attitudes (Bond and Sanders 2009; Gregg and Washbrook 2011; Jacob and Wilder 2010; Zafar 2009). Our main focus is on business cycle effects, and for the absence of information on revealed ability to distort our results would require that young people and their families sort into regions with different rates of unemployment on the basis of their revealed ability. This seems unlikely – data on GCSE performance indicate that the proportion of 16 year olds achieving five or more GCSEs at grades A-C varies more within metropolitan regions than it does across regions (Department for Education 2012). Furthermore, we estimate panel data models which incorporate time-invariant individual-specific unobserved heterogeneity which will capture unobserved ability. We also have no information about the school attended by the pupil, and school characteristics may have an impact on educational aspirations and attitudes.[9] Chowdry et al. (2011), for example, report that school characteristics explain 16% of the differences in test scores between children from richer and poorer families. Again however, we would need school characteristics to be distributed differently systematically across low and high

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[8] Other potential data sources, such as the Longitudinal Survey of Young People in England, Millennium Cohort Survey, National Child Development Study etc. are surveys following a single cohort over time. Such surveys tend to ask questions on educational attitudes and/or aspirations in just one year and are therefore only able to exploit geographical variation in the business cycle, are unable to allow for unobservable characteristics, and any findings may only be applicable to a specific cohort.

[9] The BHPS collects information from those aged 16 and above on the type of school most recently attended, but this may not equate to the type of school attended when completing the youth questionnaire. At waves 12 and 17, parents of children aged 11-15 were asked about the type of school each child attends. Estimating specifications including this variable for this subset of children produces results consistent with those presented here.

unemployment regions for this to bias our estimates. This could be an issue if we used unemployment rates based on smaller geographical units, and if for example all schools within that geographical unit were of the same low (or high) quality. If so, then high unemployment rates may be indicative of poor school quality, which is associated with more negative educational aspirations or attitudes. However we use metropolitan regions which are relatively large areas that contain low and high unemployment districts and schools of low and high quality.

Descriptive statistics

We first summarise responses to the questions about educational attitudes and aspirations, which we present separately by gender pooling children's responses over time. Table 1 summarises responses to the questions about how well it means to children to do well at school, and how important it is for them to get their GCSEs. This indicates that for 60% of 11-15 year olds, doing well at school means a great deal, while for a further 34% it means quite a lot. Therefore 94% of children report generally positive attitudes to school. Similarly, 77% of 11-15 year olds report that getting their GCSEs is very important while a further 21% report it to be important. Hence almost all 11-15 year olds recognise that getting GCSEs is important. This table also highlights small but statistically significant differences between boys and girls – on average girls have more positive attitudes than boys. For example, 62% (78%) of girls report that it means a great deal to do well at school (is very important to get GCSEs) compared with 59% (75%) of boys.

Table 2 summarises whether or not children want to leave school at age 16 and whether or not they would like to go to university when they are older. This reveals considerable differences between boys and girls. For example, 17% of boys report wanting to leave school at age 16, double the proportion of girls (8%). Thus despite a generally positive attitude to schooling, almost one in five boys would prefer to leave full-time education at the earliest legal opportunity. These aspirations to leave school compare with actual non-participation rates in full-time education among 16 year olds of about 18% for girls and 28% for boys, which have fallen slightly since 1994 (Broecke and Hamed 2008). Hence more children express the desire to remain in full-time education post-16 than actually do so indicating that low educational aspirations are on average not an issue. This suggests that raising educational aspirations is likely to have only small effects on exits from education at age 16.

Almost 76% of 13-15 year olds report that they would like to go to university, and so have positive aspirations for higher education. Again this proportion is significantly larger among girls (81%) than boys (70%). These aspirations for university compare with an actual participation rate in higher education of 47% (42% among men and 52% among women), which has increased markedly since the early 1990s. Hence we find that a much larger proportion of 13-15 year olds have aspirations for university than the proportion of 18 year olds that actually attend, again suggesting that low aspirations are not a substantial problem.[10]

The BHPS data allow us to identify how children's educational attitudes and aspirations change both over time and as they age, passing through secondary school and approaching the end of compulsory education. Figure 1 plots the proportions of young people over time in the BYP who report that it means a great deal to them to do well at school; that getting GCSEs is very important; that would like to leave full-time education at age 16; and that would like to go to university. A number of patterns emerge. Firstly we notice evidence of a systematic decline in having a positive attitude to school over the period of economic growth. About 70% of 11-15 year olds reported that it meant a great deal to them to do well at school in the late 1990s, and this fell to 53% by 2004 and has remained relatively stable since then. There is also evidence of a decline in the proportion who would like to go to university from a high of 80% in 2002 to 70% in 2005. However this trend was reversed with the onset of the recent recession, such that in 2010 the proportion was again at 80%. Finally, there is some evidence that the proportion of young people who wanted to leave school at age 16 rose from 10% in 1999 to 16% in 2004, but this fell sharply with the onset of the recent recession to less than 10% in 2010.[11] These patterns are consistent with lower opportunity costs of education during periods of low labour demand, which results in more positive educational attitudes and aspirations and a higher demand for education.

Figure 2 instead plots educational attitudes and aspirations by age, pooling BYP data over time. Again, some patterns emerge. For example, there is a small but continuous decline as children age in the proportion who report that doing well at school means a great deal, from 63% among 11 year olds to 59% among 15 year olds. In contrast there is small increase in the proportion who would like to go to university from 72% of 13 year olds to 76% of 15 year

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[10] Participation rates in higher education are from the Higher Education Initial Participation Rate, available online at www.bis.gov.uk/assets/biscore/statistics/docs.

olds. There is also evidence that the proportion for whom getting GCSEs is very important initially increases with age from 74% of 11 year olds to almost 80% of 13 and 14 year olds. However there is evidence that the proportion then falls back to 75% of 15 year olds. Similarly the proportion who would like to leave full-time education at age 16 initially falls between the ages of 11 and 13, but then increases such that 18% of 15 year olds would like to leave. These latter patterns are likely to reflect the availability of new information to the pupils regarding either their academic ability or the costs and benefits of remaining in education.[12] For example, Kao and Tienda (1998) document that younger children are more optimistic about their future opportunities, while older children become more aware of the potential barriers to educational success and the associated costs. The costs are either the direct financial costs of attending college or sixth form or the opportunity costs associated with not entering the labour market at age 16 (i.e. expected forgone earnings). The impacts of the business cycle on these preferences will operate through the latter, by changing young people's expectations about earnings they will forgo by remaining in education after the end of compulsory schooling. During periods of economic growth, the opportunity costs of remaining in education will be higher as labour demand and employment is high. During recessionary periods the opportunity costs are low as outside options are poor.

In Table 3 we examine directly the relationship between educational attitudes and aspirations and the macroeconomic climate. This table presents mean regional unemployment rates among 16-24 year olds by young people's educational attitudes and aspirations and their pairwise correlations separately for boys and girls. These summary statistics suggest that young people have more positive educational attitudes and aspirations when unemployment rates are higher, and this emerges for both boys and girls. For example, the average unemployment rate faced by boys who report that doing well at school means a great deal is 15.5%, more than 0.4 percentage points higher than that faced by boys who do not report this view of school. This difference is statistically significant, and also emerges for girls and with the other indicators of educational attitudes and aspirations. The pairwise correlations between educational aspirations and attitudes are also statistically significant (if small), and are consistent with the opportunity cost effect dominating – young people have a more

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[11] Some of this fall in the proportion of young people who report wanting to leave school at age 16 may be due to the change in the question wording and structure in the 2010 interview.
[12] Stinebrickner and Stinebrickner (2009) document how students update expectations in response to additional information about costs and benefits of further education for themselves.

positive view of education when unemployment rates are high and the opportunity cost of remaining in education is low.

In the remainder of the paper we directly test the extent to which the business cycle in general, and the prevailing unemployment rate faced by young people in particular, affect children's educational aspirations and attitudes.

3. Estimation strategy

Model estimation

Our research question focuses on the impact of the business cycle on young people's educational attitudes and aspirations, and our strategy to identify this is to exploit both changes over time and across regions in the unemployment rate among workers aged 16-24 and the panel nature of the BYP data. The estimation of panel data models which allow for time-invariant individual-specific unobserved characteristics is important in this context, as previous research has suggested that (unobserved) personality traits are correlated with academic motivation and achievements (Child 1989; De Raaad and Schouwenberg 1996; Entwistle 1972; Heaven 1990; Heaven et al. 2002). Failure to take such factors into account in estimation is likely to bias the estimated coefficients.

We assume that at a point in time t a young person, i, has an underlying, unobserved propensity to hold positive attitudes and aspirations towards education, denoted as $P_{i,t}^{*}$. This can be expressed as a function of range of observed child ($X_{i,t}$) and family-related ($F_{i,t}$) characteristics, the prevailing economic climate ($U_{r,t}$) and the unobserved (time-invariant) ability of the child (v_i). Specifically, the unobserved propensity to report a positive attitude to education is:

$$P_{it}^{*} = X_{it}\alpha + F_{it}\beta + U_{rt}\gamma + \varepsilon_{it} \tag{1}$$

$$\varepsilon_{it} = w_{it} + v_i \tag{2}$$

where α , β and γ are vectors of coefficients to be estimated, $i = 1,...,n$, $t = 1,...,T$. A young person reports a positive educational attitude or aspiration when his propensity crosses a threshold (zero in this case), that is, if $P_{i,t}^{*} > 0$ and $=0$ otherwise. By assuming the unobservable

individual-specific heterogeneity is time-invariant, we decompose the error term ε_{it} into the individual-specific unobservable effect, v_i, and random error w_{it}.

We estimate a number of models which make different assumptions about the nature of the individual-specific unobservable effect, v_i. Initially we treat it as random, and also assume that the w_{it} are normally distributed and independent of the observed characteristics for all i and t, and estimate random effects models. One limitation of this framework is that it assumes that the time-invariant unobserved individual-specific effect (v_i) is independent of the observable characteristics. This is quite unrealistic here as, for example, we might expect young people with higher levels of unobserved ability to have parents with higher levels of educational attainment, to have more positive attitudes to education and to live in regions with lower levels of unemployment. In this case, the estimated coefficients will pick up some of the effects of the unobservable v_i, and the impact of the prevailing unemployment rate will be positively biased. To avoid this problem, we relax the assumption that v_i is independent of the observable time-varying characteristics in X_{it}, F_{it} and U_{rt}. Following Mundlak (1978) and Chamberlain (1984), we model the dependence between v_i and the observable characteristics by assuming that the regression function of v_i is linear in the means of all the time-varying covariates. This can be written:

$$v_i = a_1 + \overline{X}_i a_2 + \overline{F}_i a_3 + \overline{U}_r a_4 + \eta_i \qquad (3)$$

We assume that η_i is independent of the X_{it} and w_{it} for all i and t, a_1 is the intercept and $\overline{X}_i$, $\overline{F}_i$ and $\overline{U}_i$ refer to the vector of means of the time varying child and family-related covariates and the region-specific unemployment rate for individual i over time. Equation (1) therefore becomes:

$$P_{it}^* = X_{it}\alpha + F_{it}\beta + U_{rt}\gamma + \overline{X}_i a_2 + \overline{F}_i a_3 + \overline{U}_r a_4 + \eta_i + w_{it} + a_1 \qquad (4)$$

$i = 1,\ldots,n$, $t = 1,\ldots,T_i$, which is equivalent to the random effects probit with additional regressors.[13]

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[13] We have also estimated probit models which explicitly recognise that responses to the educational attitudes and aspirations questions are likely to measure an underlying latent disposure to learning, and hence be correlated with each other. Estimates from these models are consistent with those presented here, and so are omitted for brevity.

The disadvantage of this framework is that the individual-specific unobserved effect may still be correlated with one or more of the time-invariant observed characteristics, resulting in biased and inefficient estimates. As robustness checks we also estimate fixed effects (or conditional) logit models, which have the advantage of allowing the unobserved individual specific effect to be arbitrarily correlated with observed characteristics in X_{it}, F_{it} and U_{rt}. A feature of fixed effects models is that when $P = 1$ or $P = 0$ for all observations for an individual, this individual's contribution to the log-likelihood is zero and their data does not contribute to the estimation. Therefore estimation of the impacts of the economic climate on educational attitudes and aspirations are identified by children whose attitudes/aspirations change over time.[14] Estimates from these fixed effects models are generally consistent with those from the random effects models and are available on request from the authors.

Our estimation procedures do not account for unobserved shocks that affect both educational attitudes/aspirations and the explanatory variables of interest. So, for example, if young people with particular characteristics experienced an unobserved event associated with both their attitudes and the prevailing unemployment rate, then the estimated coefficients would suffer from omitted variable bias. We attempt to allow for any such potential shocks by including in all our model specifications a range of child- and family-specific characteristics which we describe below. In addition, we measure the unemployment rate at the regional level, such that each region contains pockets of wealth and deprivation and is likely to contain schools of varying quality. Thus any neighbourhood or school-specific effects are likely to be averaged out within regions.

Model specification

We control for a range of child- and family-specific observed characteristics in our models, following pointers from economic theory and previous research. Economic theories of parental investment suggest that parents invest in their child's education as they care about their future wellbeing (Becker and Tomes 1986). Families with lower incomes will be less able to invest optimal amounts into their children's education or may be prevented from

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[14] Using a balanced panel, we find different levels of persistence in responses to the questions of interest. For example, almost 40% of young people respond to the same way to the question about how much it means to them to do well at school, while two-thirds change their response no more than once. Two thirds always respond in the same way to the question about liking to go to university. In contrast, more than 80% always report the same response to the question about leaving school at 16 and only 7% change their response more than once, and 90% always respond the same way to question about the importance of getting GCSEs.

providing their children with an appropriate learning environment (Carneiro and Heckman 2002; Mayer 1997). Furthermore parental income has been shown to have significant impacts on educational attainment and explain the persistence of disadvantage across generations (Shavit and Blossfeld 1993), while parental wealth and socioeconomic status is inversely correlated with children's educational aspirations and expectations (Chowdry et al. 2011; Ermisch et al. 2001; Gregg and Washbrook 2011). We therefore include controls for parental income (a binary variable taking the value one if the child is in a household in the bottom quintile of the gross household income distribution at time *t*) and parental socioeconomic status and wealth (binary variables capturing whether or not the child lives in a workless household and housing tenure at time *t*). It is also important to control for the educational attainment of the child's parents, as there is a wide literature on the intergenerational transmission of cognitive abilities (Anger and Heineck 2010; Black et al. 2009; Bjorklund et al. 2009). We include a binary variable indicating whether or not the child has at least one (resident) parent with a university degree. Factors such as parental income, employment, wealth and education are likely to determine the home and school environments that they choose for their children. We do not assign any causal interpretation to the estimated effects of these controls as such variables are likely to capture wider processes operating within families. For example more able parents are more likely to both have higher incomes and to raise more cognitively developed children through better parenting, greater preference for educational investments, and/or genetic links in cognitive ability. Therefore rather than assigning causality, we acknowledge that these controls are capturing important determining factors (for example any impact of parental education could be due to parenting styles adopted rather than the education level attained itself).

A number of other household characteristics are included in the models, such as the number of siblings, whether or not the child is currently living in a lone parent household, and the age of the child's mother. These capture other household dynamics and environments that may influence the child's attitudes to schooling either directly or indirectly. We also control for the child's age and gender. There is an acknowledgement in the literature that children's educational aspirations and attitudes partly reflect their perceptions of the costs and benefits of education and schooling and any constraints faced, which develop as they age (Gutman and Akerman 2008). Girls have been found to exhibit more positive educational aspirations and attitudes than boys (Schoon et al. 2007; Willitts et al 2005).

There is evidence that young people from ethnic minorities have higher educational aspirations (Strand 2007), but that their parents may not have the information necessary to help these children achieve (Powney et al. 1998). Also teachers may lower the expectations of particular ethnic minority groups (Strand 2007). Both BHPS and UKHLS data contain information on ethnicity, however sample sizes are too small in the BYP sample to separately identify each group and it is not really acceptable to simply differentiate between white British respondents and the remainder because the residual category hides large and genuine diversity in behaviour between ethnic minority groups (National Equality Panel 2010). We instead classify young people according to whether their parents arrived in the UK after age 15 on the grounds that this is a more reasonable way of identifying disadvantage in terms of the educational system. Parents who arrived after age 15 had their compulsory schooling outside of the UK and, for most, English was not learnt during childhood. All models also include year and region fixed effects. We present summary statistics for these controls in the Appendix.

4. Results

We present estimates from our baseline models in Tables 4-8, with each table relating to a different measure of educational attitudes and aspirations. We estimate a series of models, to examine how the estimated coefficient on the explanatory variable of interest changes as we impose a different estimation structure. We first estimate models pooling observations across young people over time and treating them as independent, implicitly assuming that there is no correlation between individuals' responses over time. We next estimate random effects models under the assumption that the time-invariant individual-specific effect is independent of the observed characteristics. We finally estimate random effects models which allow for correlation between the individual-specific unobserved terms and the time-varying observable characteristics, which is our preferred specification. In addition, where appropriate, we estimate both ordered models which explicitly allow for the ordered natured of responses to the questions and binary models where we collapse the responses into binary indicators. We initially discuss estimates from models where the dependent variable captures how much it means to the student to do well at school, presented in Table 4.

The first column of estimates reports results from an ordered probit model where we pool responses from individuals over time, while the second column reports estimates from a random effects ordered probit which assumes the individual-specific unobserved effect is

independent of the observed characteristics. In these the dependent variable takes the value 0 if doing well at school means very little, 1 if it means a bit, 2 if it means quite a lot and 3 if it means a great deal. The subsequent two columns report estimates from random effects probit models where the dependent variable takes the value 1 if doing well at school means a great deal to the young person, and 0 otherwise. The first assumes independence between the unobserved effects and the observed characteristics while the second relaxes this assumption by allowing the unobserved effect to be correlated with the time-varying observed characteristics. The final column reports marginal effects relating to the final set of estimates, calculated at the sample means. In all models positive coefficients indicate that the relevant variable is associated with a more positive attitude to schooling while negative coefficients indicate a more negative attitude.

In all models, we find that the estimated coefficient on the regional youth unemployment rate is positive and statistically significant at the 5% level. Hence we find that young people living in regions with higher rates of unemployment are more likely than those in regions with low unemployment rates to report a positive attitude to school – evidence supporting the discouraged worker effect and that young people view school more positively when the opportunity cost of schooling is low. The marginal effect indicates that a one percentage point higher unemployment rate is associated with a 0.9 percentage point increase in the probability of reporting that doing well at school means a great deal. This is a relatively large effect if we consider that over the time period considered, the male youth unemployment rate within regions fluctuated by as much as twenty percentage points (from 10% to 30%). This indicates that from peak to trough of the economic cycle, the probability of a young person reporting a positive attitude to schooling can increase by as much as 18 percentage points. Hence one outcome of the recent recession is that it will have raised attitudes to schooling among young people.[15]

The estimated coefficients on the other controls reveal other important patterns. For example, children aged 11 have more positive attitudes to schooling than 15 year-olds. The estimated marginal effect suggest that an 11 year-old is 7 percentage points more likely to report that

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[15] It may be argued that families with positive educational attitudes and aspirations relocate to areas of low unemployment, and thus the unemployment rate is endogenous. This is unlikely to be an issue here because (i) unemployment rates vary as much across districts within metropolitan regions as across metropolitan regions; and (ii) regional migration rates among families with children are extremely low in the UK – fewer than 2% of

doing well at school means a great deal than an otherwise similar 15 year-old. This is likely to reflect growing awareness of both the costs and benefits of schooling and of own ability as the children pass through secondary school. Consistent with much previous research, we find that girls are significantly more likely than boys to report that doing well at school means a great deal, by 7.5 percentage points at the sample means. We also find evidence that children from less advantaged households are less likely than their peers from more advantaged households to report that doing well at school means a great deal. For example, living in a workless household reduces the probability by 6.6 percentage points relative to living in a household where at least one person is in employment. There is also evidence that those in social housing and in lone parent households are less likely than those in families that own their own home and two parent families to report that doing well at school means a great deal. However these effects lose statistical significance in the preferred random effects model with additional regressors. These relationships may capture a range of mechanisms, for example relating to parenting style, the home learning environment, and engagement of the parents with the child's school work and school life. We are unable to distinguish between these mechanisms with these data. Finally, it is noticeable that children whose parents arrived in the UK after the age of 15 have a significantly higher probability than those with parents exposed to the UK education system to report that doing well at school means a great deal, by almost 22 percentage points at sample means. This is an extremely large effect, and is likely to reflect the fact that migrants are positively selected and this is transmitted to their children. It has been found, for example, that immigrant minorities often have high aspirations for their children to obtain educational qualifications as a means of social and occupational mobility (Kao and Tienda 1995; Strand 2007; Willitts et al. 2005).

We present the results from models estimating the impact of the business cycle on attitudes towards the importance of getting GCSEs in Table 5. These models progress in a similar way to those in Table 4: in the first two specifications the dependent variable takes the value 0 if the child reports that getting GCSEs is not at all important, 1 if not very important, 2 if it is important and 3 if it is very important. The subsequent two columns report estimates from random effects probit models where the dependent variable takes the value 1 if getting GCSEs is perceived as very important and 0 otherwise; the first assumes independence between the unobserved effects and the observed characteristics while the second relaxes this

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individuals move across regional boundaries each year and inter-regional migration rates among families with

assumption by allowing the unobserved effect to be correlated with the time-varying observed characteristics. Positive coefficients therefore indicate that the variable is associated with a more positive attitude to GCSEs while negative coefficients indicate a more negative attitude.

The estimates suggest that children place more importance on GCSEs when unemployment rates are high – the coefficients are positive and statistically significant in the first three models estimated. However, when allowing for correlation between the observable characteristics and the individual-specific unobserved heterogeneity, the estimated coefficient remains positive but is no longer statistically significant. This suggests that the positive effects found in previous models were the result of child-specific unobserved characteristics that were correlated with the unemployment rate in their region of residence.

The estimated coefficients on other variables again reveal other important relationships. For example, we find that 14 year-olds are more likely than 15 year-olds to report that GCSEs are important. This may reflect the fact that 15 year olds have more information about their likely GCSE performance and consequently may be more likely to downplay their importance. As with the importance of school, we find that girls are significantly more likely than boys to report that it is very important to get GCSEs, by almost 7 percentage points at sample means. We also find that children with highly educated parents are more likely than those parents with qualifications below degree level to report that getting GCSEs is very important, by almost 4 percentage points. This may reflect the fact that more highly educated parents create a more learning based environment for their children either through their parenting style or through their own attitudes and aspirations.

Some other variables have economically large but statistically insignificant impacts on the probability of reporting that GCSEs are very important. For example living in local authority housing and in a workless household increase the probability by 7.7 and 3.7 percentage points respectively although these effects are poorly determined. What emerges from the models is that impacts of these characteristics change sign when incorporating the individual means of the time-varying covariates over time, from being negative in the first three models to positive. This suggests that children living in social housing and in workless households have

children are even lower (Böheim and Taylor 2002).

other (unobserved) characteristics which are associated with placing less importance on GCSEs.

Table 6 reports estimates from a series of probit models where the dependent variable takes the value 1 if the child reports wanting to leave school at age 16, and 0 otherwise. In these models, positive coefficients indicate that the child does not aspire to remain in education while a negative coefficient indicates that the child does aspire to remain in education past compulsory schooling. Consistent with estimates from the previous models, we find that when unemployment is high children are less likely to report wanting to leave full-time education at age 16, and hence that educational aspirations are counter-cyclical. Again, however, this effect loses significance in the model where we allow for correlation between the observed characteristics and the individual-specific unobserved effect. Therefore any cyclicalities in aspirations to remain in education are accounted for by unobserved differences between children and their environment.

Other factors emerge as significant correlates of aspirations for education participation. We find that 15 year-old children emerge as being most likely to want to leave education at age 16, with a probability some 1.5 to 2.2 percentage points higher than 12-14 year olds. This is likely to reflect the acquisition of new information relating both to the costs and benefits of remaining in education and to the opportunities available. A large gender effect emerges as in previous models, with girls being some 8 percentage points less likely than otherwise similar boys to report wanting to leave education at age 16. Parental education is also an important factor contributing to children's aspirations – those with parents educated to degree level are 5 percentage points less likely to report wanting to leave education at 16 than those with less educated parents. Again, this is likely to reflect the home environment, culture towards education and parental attitudes. We also find that children with migrant parents who were not exposed to the UK educational system have more positive educational aspirations, being some 4 percentage points less likely to want to leave school at 16 than those with parents who did progress through the UK system. This is likely to reflect the positive selection of migrants together with more positive aspirations towards education and hopes for their children that migrants hold.

Table 7 reports estimates from models of aspirations towards higher education, where the dependent variable takes the value 1 if the child reports wanting to attend university and zero

if they do not want to go to university. In these models sample sizes are smaller because the question was only asked of 13-15 year olds from 2002 onwards. In the pooled probit model, we find that such positive aspirations are counter-cyclical – children are more likely to report wanting to go to university in years and regions with high unemployment rates. Again this is consistent with the opportunity cost and discouraged worker hypotheses. However this effect loses statistical significance once we allow for unobserved characteristics, and becomes even smaller and less well determined when allowing for correlation between unobservables and observables, again suggesting that any correlation between the unemployment rate and aspirations for university attendance is due to the unobserved characteristics of children in high unemployment regions.

Other factors correlated with university aspirations among children include age, gender, parental education and household income. In particular the estimates suggest that aspirations for university increase as children age – 13 year old children are 4 percentage points less likely to want to go to university than 15 year old children, all else equal. Girls are 17 percentage points more likely than otherwise similar boys to want to go to university – which is the single largest effect. Parental education is also important – children with at least one parent with a university degree are 14 percentage points more likely than those without university educated parents to want to go to university themselves. This is likely to reflect different learning environments, culture of learning and parental aspirations of each group. We also find that children in low income households, defined as being in the bottom 20% of the gross household income distribution, have higher aspirations for university attendance than higher income households. This seems rather counter-intuitive, given the literature indicating that children from more advantaged households have higher aspirations than those from less advantaged households (see among others Chowdry et al. 2011; Goodman and Gregg 2010; Schoon et al. 2007). However there is also evidence that low income families have high aspirations for their children and value their schooling (Raby and Walford 1981; Calder and Cope 2004; Kintrea et al. 2011; St Clair and Benjamin 2011), and these higher aspirations for university among children in low income households may reflect this.

The results from these multivariate models provide weak evidence that children's educational attitudes and aspirations vary counter-cyclically. That is, during periods when unemployment is high, children view schooling and education more positively due to the fact that the opportunity costs of education are lower (the probability of getting a job and expected wage

conditional on finding a job are lower than during periods of low unemployment). However this effect largely disappears when controlling for individual-specific unobserved characteristics that are correlated with observed characteristics, indicating that children in high unemployment regions have unobserved characteristics associated with more negative educational attitudes and aspirations. We next extend this analysis to investigate whether the cyclicality of educational attitudes and aspirations vary by parental socioeconomic status and parental attitudes to education. If so it could have important implications for social mobility and life chances.

5. Model extensions

Interactions with parental education

We next investigate whether the impact of a weak labour market on children's educational attitudes and aspirations vary according to their parent's educational background. We might expect, for example, that children with more highly educated parents are more responsive to macroeconomic shocks as their parents may be more aware of the labour market implications and thus adapt their behaviour or the learning environment appropriately. We examine this by interacting the local unemployment rate with parental level of education, and in particular whether at least one parent has a university degree (and so is highly educated family), whether neither parent has GCSEs (and so is low educated family), or whether the education of the parents lay between GCSE and degree level.[16] We again estimate these models using random effects probit models with additional regressors.

These estimates prove to be quite revealing. We find evidence indicating that children's educational attitudes and aspirations respond to economic shocks in different ways depending on the educational level of their parents. The first column of Table 8 presents estimates from the model where the dependent variable takes the value 1 if it means a great deal to the child to do well at school, and zero otherwise. Here we find that for children who have at least one parent educated to degree level, a one percentage point increase in the unemployment rate is associated with a 1.2 percentage point increase in the probability that doing well at school means a great deal. This is approximately double the size of the impact for children for whom

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[16] We also investigated whether the impact of the unemployment rate varied across other characteristics, such as gender, age, household income etc., but generally these interactions were not statistically significant. The exception was that with gender, which indicates that girls' attitudes and aspirations are more positively associated with increases in unemployment rates than those of boys. This suggests that an economic recession will have a larger harmful effect on the attitudes and motivation of boys than girls.

neither parent has a GCSE (0.5 percentage points). Furthermore, the difference in the size of the effects for children with high and low educated children is statistically significant (at the 8% level). This suggests that the educational attitudes and aspirations of children with highly educated parents are more positively affected by the unemployment rate than those with parents with few qualifications.

A similar pattern emerges when looking at the desire to leave school at age 16. Here we find that for children for whom neither parent has GCSEs, a one percentage point increase in the unemployment rate is associated with a 0.4 percentage point increase in the probability of wanting to leave school at 16 (statistically significant at the 10% level). Hence for these children, a negative macroeconomic shock is associated with an increase in the probability of having negative educational aspirations. The estimated effects among children with more highly educated parents are negative but not statistically significant from zero, and the differences in impact by parental education are bordering on statistical significance. Therefore the educational aspirations of children with low educated parents will diminish during economic downturns, while those of children with more highly educated parents will remain unaffected. The implication is that any social mobility resulting from the equalising of aspirations and attainment among children from more and less advantaged backgrounds will slow and possibly reverse as a result of a macroeconomic shock, as children with low educated parents reduce their aspirations and suffer the likely consequences in terms of school performance, attainment, and other behaviour relative to those with high educated parents.

Estimates from the final model support this, as they indicate that the university aspirations of children with low educated parents are negatively affected by increases in the unemployment rate (statistically significant at the 10% level) while those of children with highly educated parents are little affected. The size of the negative effect for children with low educated parents is relatively large, with a one percentage point increase in the unemployment rate reducing the probability of wanting to go to university by 1.2 percentage points. Furthermore, the difference in estimates by having low and high educated parents is statistically significant at the 5% level (p-value of 0.033). Again, therefore, we find that macroeconomic shocks reduce educational aspirations among children with low educated parents relative to those for children with high educated parents. These reductions in aspirations for university are likely to have adverse consequences for subsequent educational attainment and other behaviour

among children with low educated parents, reducing their life chances and stalling social mobility.

Interactions with parental attitudes to education

We next include interactions between the prevailing unemployment rate among 16-24 year olds and the attitudes to education of the child's parents. At waves 12 and 17 (2002 and 2007), parents of children aged 11-15 were for each child asked (1) "How important do you think it is for 'child' to complete his/her GCSE level/Standard Grades exams? Is it very important, important, not very important, not at all important?"; (2) "And how important do you think it is for 'child' to stay on and complete his/her A level/Highers exams? Is it very important, important, not very important, not at all important?"; and (3) "Would you personally like to see 'child' going onto university or college when they finish/finished their schooling?". We interpret responses to these questions as permanent, time invariant measures of parental attitudes to education, and so allocate the responses to each observation for the relevant child.[17] A child is identified as having parents with positive attitudes to education if at least one parent reports it very important that the child completes their GCSEs, complete their A level exams or would like to see the child go to university, as appropriate.[18] We include these as additional explanatory variables in our models, and as interactions with the prevailing unemployment rate, with estimates presented in Table 9.[19]

The first panel presents estimates from random effects probit models where the dependent variable takes the value 1 if the child reports that it means a great deal to do well at school and zero if it means very little, a bit or quite a bit. These indicate that the probability of reporting that doing well at school means a great deal is lower when the unemployment rate is higher, but only among children whose parents do not view completing GCSEs as very important. The estimated coefficient on this interaction term is negative (–0.062) and

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[17] It may be argued that parental attitudes will reflect the revealed ability of the child and so will evolve as the child ages. However in further analysis (not shown) we find that parental attitudes are independent of child age at date of interview, suggesting that all else equal parents of younger children (for whom information on ability will be limited) have the same attitudes as those of older children (for whom more information on ability will have been revealed). Furthermore, we find that parental attitudes to education are stable both across children and over time. For example about 90% of parents with two children aged 11-15 in 2002 report the same aspirations for both, while 80% of parents with children aged 11-15 in both 2002 and 2007 report the same aspirations in both periods.

[18] A-Level exams are typically taken at the end of two years of study at age 18, and represent the university entrance-level qualification typically taken at age 18.

[19] These models are restricted to data from1998-2008 as responses to the parental attitudes questions are conditional on having a child aged 11-15 in 2002 or 2007.

statistically significant at the 10% level. At the sample means, a one percentage point increase in the unemployment rate reduces the probability of the child reporting that doing well at school means a great deal by 2.3 percentage points. It has no impact on children with parents who regard completing GCSEs as very important. Hence we find that the prevailing unemployment rate has a negative impact on educational attitudes, but only among children whose parents have less positive attitudes to schooling.

The next columns present estimates from random effects probit models where the dependent variable takes the value 1 if the child reports that it is very important to get GCSEs, and zero if they report that it is not at all important, not very important or important. Again we find that the impact of the macroeconomic climate on children's attitudes to education differs significantly by parental attitudes. In particular, among children with parents who view completing GCSEs as very important, a higher unemployment rate is associated with a higher probability of regarding GCSEs as very important. The estimated coefficient is positive (0.024) and statistically significant at the 10% level, and indicates that a one percentage point increase in the unemployment rate is associated with a 0.5 percentage point increase in the probability. It has a negative (but statistically insignificant) impact among children with parents who do not view GCSEs as very important. This indicates that negative economic shocks have a positive impact on attitudes towards GCSE attainment, but only among children with parents who view GCSE completion as very important.

Similar patterns emerge in the final columns of the table. The estimates here suggest that a higher unemployment rate is associated with a lower probability of wanting to go to university, but only among children with parents who do not want them to go to university. The estimated coefficient is negative (–0.075) and statistically significant at the 5% level, such that a one percentage point increase in the unemployment rate reduces the probability of wanting to go to university by 2.5 percentage points. However the macroeconomic climate has no impact on the university aspirations of children with parents who would like them to go to university. Thus we find in general that the educational attitudes and aspirations of children with parents who hold less positive attitudes towards education are more adversely affected by negative macroeconomic shocks than those with parents who hold positive attitudes towards education. This suggests that children of parents who do not hold positive attitudes towards education perceive a negative economic shock as reducing the returns to

education, and so are less likely to value it as an investment during periods of high unemployment.

6. Conclusions

In this paper we have investigated the sensitivity of young people's educational attitudes and aspirations to fluctuations in the macroeconomic climate using panel data from the BYP, covering the period 1994-2010. These data allow us to exploit variation in labour demand both between regions and over time in identifying its relationship with educational attitudes and aspirations, using a period that covered the recovery from the recession of the early 1990s, the subsequent period of economic growth, and the more recent 'Great Recession'. Furthermore, panel data allow us to estimate models that take into account individual-specific unobserved effects, which we show are important in this context.

The first observation to make is that, on average, young people have very positive educational attitudes and aspirations. For example larger proportions of young people report wanting to stay on in education post-16 and wanting to attend university than actually do so. This indicates that low aspirations are not an issue per se, and that further improving educational aspirations in this age group is unlikely to have a substantial impact on subsequent educational choices.

In the raw data, we find that educational aspirations and attitudes of 11-15 year olds are counter-cyclical. That is, children tend to view their school work, the importance of GCSEs, participating in post-compulsory schooling and attending university more positively when unemployment is relatively high. Furthermore, these findings generally hold in econometric models that control for a range of child- and family-specific characteristics and year and region indicators. This is consistent with the opportunity cost and discouraged worker arguments – children view education more positively when the perceived probability of finding a job and the expected income outside of education are both low. It is also consistent with previous evidence suggesting that a weak youth labour market increases participation in post-compulsory education (Clark 2011; McVicar and Rice 2001; Whitfield and Wilson 1991). However we also find that these effects largely disappear in panel data specifications that also allow for individual-specific unobserved effects, and especially when these unobserved effects are allowed to correlate with observed characteristics. This suggests that most of the relationship between the prevailing unemployment rate and educational

aspirations and attainment can be explained by unobserved characteristics of children living in areas most affected by any negative macroeconomic shock (i.e. by omitted variable bias). One potential source of such bias may be the quality of schooling.

More detailed analysis suggests that the impact of macroeconomic shocks on children's educational attitudes and aspirations differs according to the education of their parents and their parents' attitudes to education. In particular, we find that the attitudes to schooling and to the importance of GCSE examinations among children with highly educated parents are more positively affected by macroeconomic shocks than those among children with less educated parents. More strikingly, we find that the prevailing unemployment rate reduces educational aspirations – in terms of wanting to remain in post-compulsory education and to go to university – among 11-15 year olds with low educated parents, while it has no impact among children with high educated parents. The sizes of some of these effects are large, given the variance in unemployment rates over the time period covered by these data, implying for example a reduction in the probability of wanting to go to university by as much as 25 percentage points among children with low educated parents relative to children with high educated parents. If, as the literature suggests, positive attitudes to schooling are associated with higher attainment and a lower propensity to participate in anti-social and deviant behaviour, then our findings suggest that a negative macroeconomic shock will have beneficial effects for desirable outcomes for children with highly educated parents, but negative effects for children with low educated parents. This has the potential to disrupt and stall social mobility for a generation growing up during an economic recession.

A similar pattern emerges when relating children's attitudes and aspirations with those of their parents. The educational attitudes and aspirations of children with parents who hold less positive attitudes to education are reduced by negative macroeconomic shocks, while those of children with parents who hold positive attitudes to education are unaffected. Again, the sizes of these effects are large, considering the variance in unemployment rates over the relevant period.

These findings have clear policy implications. The fact that macroeconomic shocks have differential impacts on educational attitudes and aspirations depending on their parent's education suggests that without suitable intervention, the motivation, behaviour and educational attainment of children with low educated parents will fall behind those of

children with highly educated parents. This suggests that for a cohort of young people who proceed through secondary school during an economic recession, the educational attainment and life-chances of those with low educated parents will fall behind those of their peers with high educated parents. This will reduce social mobility for a cohort. To prevent his, policy makers should respond to negative economic shocks by targeting appropriate policies aimed at maintaining positive educational attitudes and aspirations towards children and their parents in neighbourhoods and schools where a high proportion of the population have low qualifications.

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Tables and figures

Table 1: Attitudes to schooling among 11-15 year olds: BHPS 1994-2010

	How much does it mean to do well at school?			How important is it to get GCSE exams?		
	Boys	Girls	Both	Boys	Girls	Both
Very little/not at all	1.5	1.0	1.2	0.7	0.5	0.6
A bit/not very	5.5	4.1	4.8	1.9	1.3	1.6
Quite a lot/important	34.1	33.0	33.6	22.1	20.5	21.3
A great deal/very important	59.0	61.9	60.4	75.3	77.8	76.5
N observations	7838	7618	15456	4765	4660	9425

Notes: Column percentages. Weighted young person's weights. Gender differences statistically significant at the 5% level.

Table 2: Aspirations for further education among 11/13-15 year olds by gender: BHPS 1994-2010

	Wants to leave school at age 16	Would like to go to university
Boys	16.9	70.0
Girls	8.4	81.1
Both	12.7	75.5
N observations	14252	5584

Notes: Weighted using young person's weights. Gender differences statistically significant at the 1% level. Intentions at age 16 were asked of 11-15 year olds, while preferences for university attendance was asked of 13-15 year olds.

Figure 1: Educational aspirations and attitudes among 11-15 year olds over time: BHPS 1994-2010
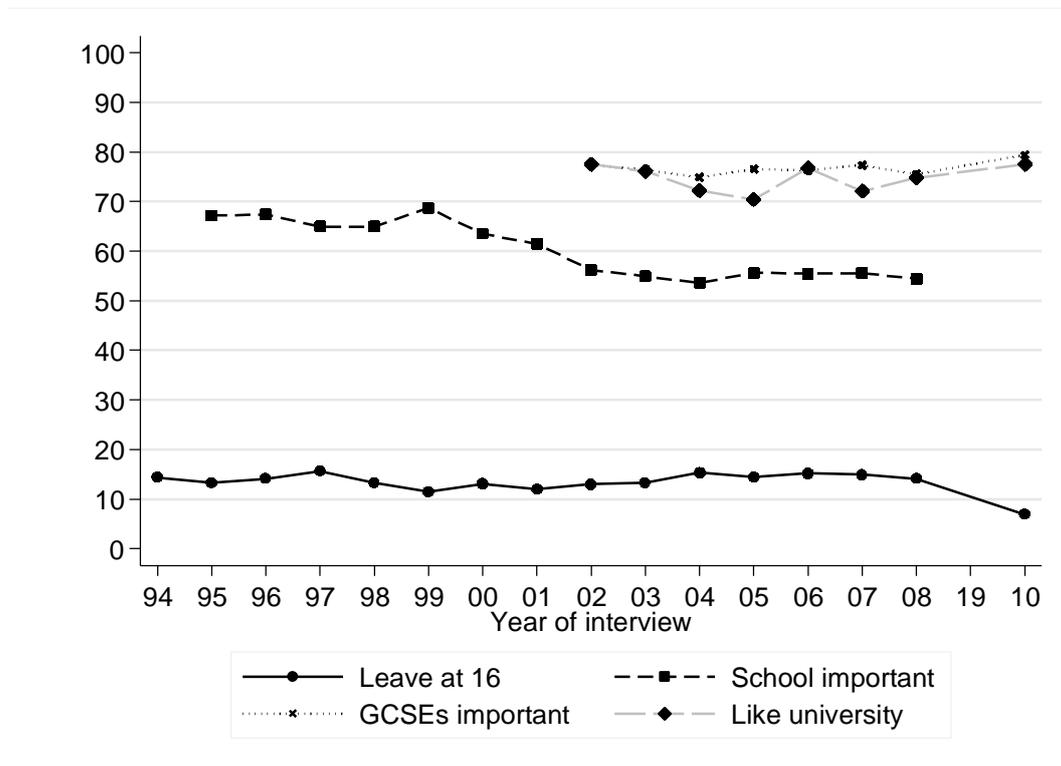
Figure 2: Educational aspirations and attitudes among 11-15 year olds by age: BHPS 1994-2010
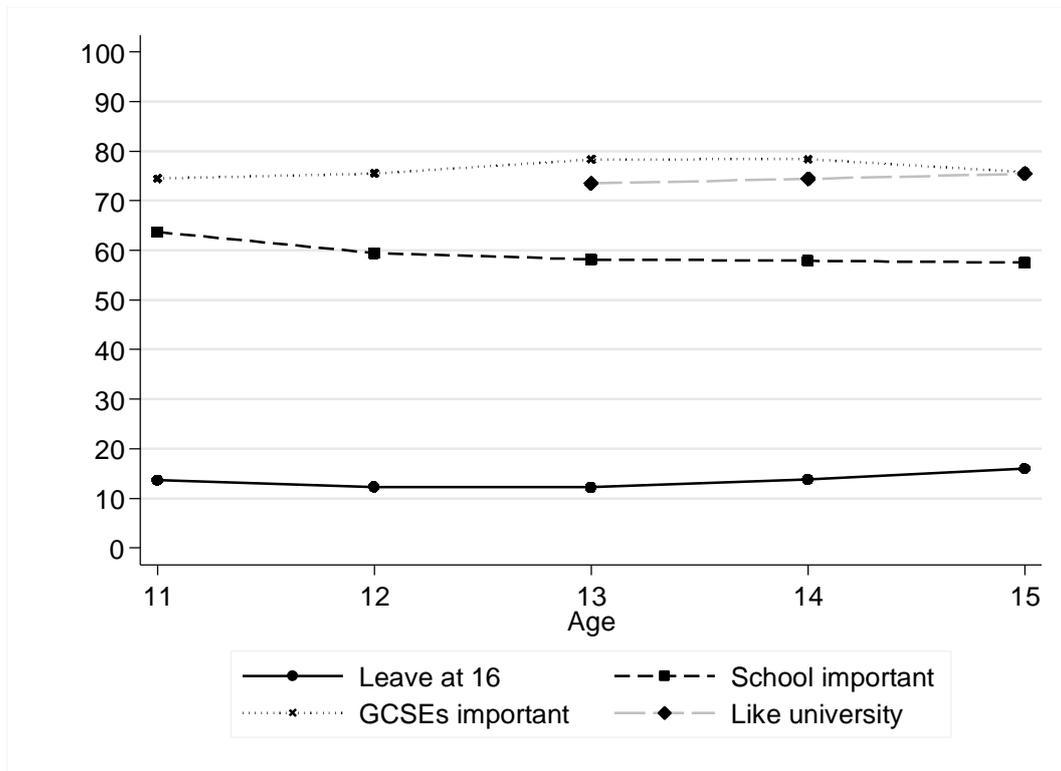
Table 3: Mean unemployment rate by educational aspirations and attitudes: BHPS 1994-2010

| | Do well at school | | Important to get GCSEs | | Leave school at 16 | | Go to university | |
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Yes	11.53	15.51	12.06	15.99	11.44	15.58	12.08	16.06
No	11.23	15.07	11.72	15.33	11.81	15.86	11.53	15.60
Difference	0.30*	0.44*	0.34*	0.66*	−0.37*	−0.28*	0.55*	0.46*
Correlation	0.042*	0.050*	0.067*	0.066*	−0.031*	−0.025*	0.050*	0.065*

Notes: Unemployment rates are for 16-24 year olds and are gender- and year-specific within metropolitan regions. Weighted using young person's weights. * indicates statistical significance at the 5% level.

Table 4: Determinants of attitudes towards the importance of school: BHPS 1994-2010

	Ordered probit	RE ordered probit	RE probit	RE probit with additional regressors	Marginal effects
Unemployment rate	0.014	0.013	0.018	0.024	0.009
	[2.80]	[2.29]	[2.83]	[2.72]	
Age 11	0.170	0.209	0.195	0.200	0.072
	[5.40]	[5.25]	[4.44]	[4.21]	
Age 12	0.065	0.098	0.064	0.067	0.025
	[2.24]	[2.63]	[1.54]	[1.53]	
Age 13	0.034	0.054	0.026	0.028	0.010
	[1.19]	[1.48]	[0.64]	[0.66]	
Age 14	0.026	0.058	0.026	0.025	0.009
	[1.01]	[1.63]	[0.65]	[0.63]	
Girl	0.179	0.235	0.228	0.206	0.075
	[5.29]	[5.35]	[4.77]	[3.92]	
Single parent household	−0.085	−0.101	−0.128	−0.080	−0.030
	[2.34]	[2.31]	[2.62]	[0.95]	
Number of siblings	0.004	0.005	0.009	−0.005	−0.002
	[0.33]	[0.28]	[0.50]	[0.11]	
Mother age/10	−0.004	−0.005	−0.006	−0.019	−0.007
	[0.27]	[0.23]	[0.28]	[0.48]	
Parent has degree	0.040	0.071	0.040	0.036	0.014
	[1.09]	[1.44]	[0.74]	[0.67]	
Workless household	−0.095	−0.152	−0.114	−0.178	−0.066
	[2.27]	[3.05]	[2.05]	[2.22]	
Low income household	−0.035	0.005	0.003	0.052	0.019
	[1.00]	[0.23]	[0.07]	[0.95]	
Parents in UK after age 15	0.388	0.668	0.704	0.707	0.218
	[2.88]	[3.56]	[3.57]	[3.57]	
Local authority tenant	−0.148	−0.206	−0.155	−0.095	−0.035
	[4.07]	[4.44]	[3.06]	[0.74]	
Private tenant	−0.073	−0.108	−0.100	−0.258	−0.097
	[1.29]	[1.57]	[1.33]	[1.95]	
Year indicators	Yes	Yes	Yes	Yes	
Region indicators	Yes	Yes	Yes	Yes	
Individual means of TVC	No	No	No	Yes	
Rho		0.476	0.505	0.505	
Log-likelihood	−13208	−12285	−9230	−9226	
N observations			15167		
N individuals			4805		

Notes: In ordered probit models, dependent variable takes value 0 if doing well at school means very little, 1 if it means a bit, 2 if it means quite a lot and 3 if it means a great deal. In probit models, dependent variable takes the value 1 if it means a great deal and 0 otherwise. All models also include year and region fixed effects. TVC refers to time-varying covariates. Marginal effects are from the random effects probit with additional regressors, calculated at the sample means. Absolute t-statistics in brackets.

Table 5: Determinants of attitudes towards the importance of GCSEs: BHPS 1994-2010

	Ordered probit	RE ordered probit	RE probit	RE probit with additional regressors	Marginal effects
Unemployment rate	0.018	0.021	0.018	0.015	0.004
	[2.65]	[2.52]	[2.04]	[1.29]	
Age 11	−0.017	−0.030	−0.057	−0.099	−0.027
	[0.38]	[0.53]	[0.98]	[1.48]	
Age 12	0.017	0.025	−0.007	−0.045	−0.012
	[0.38]	[0.47]	[0.13]	[0.73]	
Age 13	0.095	0.123	0.111	0.091	0.022
	[2.27]	[2.31]	[1.99]	[1.58]	
Age 14	0.098	0.138	0.115	0.111	0.027
	[2.44]	[4.38]	[2.08]	[2.00]	
Girl	0.183	0.253	0.226	0.226	0.067
	[3.99]	[4.38]	[3.80]	[3.43]	
Single parent household	−0.061	−0.073	−0.056	−0.117	−0.012
	[1.25]	[1.25]	[0.93]	[0.97]	
Number of siblings	−0.004	−0.005	0.010	0.096	0.023
	[0.21]	[0.22]	[0.42]	[1.66]	
Mother age	0.009	0.012	0.011	−0.039	−0.019
	[0.40]	[0.44]	[0.37]	[0.75]	
Parent has degree	0.104	0.174	0.177	0.149	0.036
	[2.16]	[2.89]	[2.87]	[2.40]	
Workless household	−0.103	−0.117	−0.106	0.154	0.037
	[1.73]	[1.67]	[1.44]	[1.23]	
Low income household	−0.118	−0.077	−0.058	0.078	0.019
	[2.56]	[1.45]	[1.04]	[1.07]	
Parents in UK after age15	−0.005	−0.031	−0.089	−0.047	−0.019
	[0.03]	[0.12]	[0.34]	[0.18]	
Local authority tenant	−0.041	−0.075	−0.057	0.335	0.077
	[0.81]	[1.19]	[0.87]	[1.63]	
Private tenant	−0.028	−0.062	−0.064	0.002	0.000
	[0.40]	[0.73]	[0.73]	[0.01]	
Year indicators	Yes	Yes	Yes	Yes	
Region indicators	Yes	Yes	Yes	Yes	
Individual means of TVCs	No	No	No	Yes	
Rho		0.416	0.423	0.424	
Log-likelihood	−5781	−5512	−4755	−4742	
N observations				9255	
N individuals				3359	

Notes: In ordered probit models, dependent variable takes value 0 if getting GCSEs is not at all important, 1 if not very important, 2 if it is important and 3 if it is very important. In probit models, dependent variable takes the value 1 if it is very important and 0 otherwise. All models also include year and region fixed effects. TVC refers to time-varying covariates. Marginal effects are from the random effects probit with additional regressors, calculated at the sample means. Absolute t-statistics in brackets.

Table 6: Determinants of attitudes towards leaving school at 16: BHPS 1994-2010

	Probit	RE probit	RE probit with additional regressors	Marginal effects
Unemployment rate	−0.020	−0.024	−0.005	−0.001
	[3.15]	[2.38]	[0.40]	
Age 11	−0.123	−0.207	−0.111	−0.011
	[2.84]	[3.08]	[1.53]	
Age 12	−0.193	−0.306	−0.228	−0.021
	[4.66]	[4.73]	[3.34]	
Age 13	−0.183	−0.286	−0.236	−0.022
	[4.53]	[4.51]	[3.63]	
Age 14	−0.099	−0.173	−0.161	−0.015
	[2.74]	[2.86]	[2.63]	
Girl	−0.556	−0.906	−0.996	−0.084
	[11.69]	[11.55]	[11.35]	
Single parent household	−0.089	−0.090	−0.015	−0.001
	[1.77]	[1.21]	[0.12]	
Number of siblings	0.009	0.021	−0.106	−0.009
	[0.48]	[0.72]	[1.67]	
Mother age	−0.037	−0.070	−0.022	−0.002
	[1.69]	[2.04]	[0.37]	
Parent has degree	−0.558	−0.972	−0.932	−0.051
	[8.91]	[9.53]	[9.03]	
Workless household	0.287	0.339	0.013	0.001
	[5.19]	[4.15]	[0.11]	
Low income household	0.030	−0.004	−0.061	−0.005
	[0.63]	[0.06]	[0.75]	
Parents in UK after age 15	−0.453	−0.774	−0.826	−0.043
	[2.76]	[2.33]	[2.44]	
Local authority tenant	0.416	0.690	−0.120	−0.010
	[8.76]	[9.13]	[0.65]	
Private tenant	0.070	0.193	−0.140	−0.012
	[0.93]	[1.67]	[0.68]	
Year indicators	Yes	Yes	Yes	
Region indicators	Yes	Yes	Yes	
Individual means of TVCs	No	No	Yes	
Rho		0.658	0.666	
Log-likelihood	−5076	−4475	−4451	
N observations		13988		
N individuals		4968		

Notes: Dependent variable takes the value 1 if the child reports wanting to leave school at age 16, and 0 if he/she wants to go to college/sixth form. All models also include year and region fixed effects. TVC refers to time-varying covariates. Marginal effects are from the random effects probit with additional regressors, calculated at the sample means. Absolute t-statistics in brackets.

Table 7: Determinants of attitudes towards going to university: BHPS 1994-2010

	Probit	RE probit	RE probit with additional regressors	Marginal effects
Unemployment rate	0.019	0.016	–0.012	–0.003
	[2.20]	[1.31]	[0.63]	
Age 13	–0.069	–0.084	–0.171	–0.004
	[1.57]	[1.39]	[2.51]	
Age 14	–0.044	–0.046	–0.084	–0.019
	[1.04]	[0.77]	[1.36]	
Girl	0.487	0.673	0.728	0.174
	[8.33]	[7.92]	[7.89]	
Single parent household	–0.136	–0.223	–0.284	–0.072
	[2.24]	[2.67]	[1.33]	
Number of siblings	0.001	0.004	0.166	0.037
	[0.06]	[0.13]	[1.69]	
Mother age	0.063	0.091	–0.006	–0.002
	[2.35]	[2.37]	[0.08]	
Parent has degree	0.510	0.742	0.716	0.141
	[8.38]	[8.07]	[7.74]	
Workless household	–0.239	–0.296	0.144	0.033
	[3.28]	[2.90]	[0.71]	
Low income household	0.034	0.108	0.346	0.075
	[0.58]	[1.34]	[2.91]	
Parents in UK after age 15	0.352	0.535	0.594	0.109
	[1.24]	[1.41]	[1.53]	
Local authority tenant	–0.088	–0.154	0.142	0.033
	[1.38]	[1.70]	[0.41]	
Private tenant	0.109	0.131	0.046	0.011
	[1.24]	[1.03]	[0.15]	
Year indicators	Yes	Yes	Yes	
Region indicators	Yes	Yes	Yes	
Individuals means of TVCs	No	No	Yes	
Rho		0.530	0.535	
Log-likelihood	–2938	–2791	–2778	
N observations		5471		
N individuals		2739		

Notes: Dependent variable takes the value 1 if the child reports wanting to go to university, and 0 if he/she wants to go to college/sixth form. All models also include year and region fixed effects. TVC refers to time-varying covariates. Marginal effects are from the random effects probit with additional regressors, calculated at the sample means. Absolute t-statistics in brackets.

**Table 8: Impact of macroeconomic climate on educational attitudes and aspirations –
estimates from models with interactions with parental education: BHPS 1994-2008**

RE probit with additional regressors	Do well at school		Important to get GCSEs		Leave school at 16		Go to university	
	Coeff	ME	Coeff	ME	Coeff	ME	Coeff	ME
Unemployment rate *								
Neither parent has GCSE	0.014	0.005	0.011	0.003	0.026	0.004	–0.037	–0.012
	[1.43]		[0.88]		[1.82]		[1.83]	
GCSE<=Parents <Degree	0.022	0.008	0.012	0.003	–0.011	–0.001	–0.011	–0.003
	[2.38]		[1.02]		[0.83]		[0.59]	
At least one parent has degree	0.037	0.012	0.025	0.005	–0.011	–0.000	0.008	0.001
	[2.77]		[1.58]		[0.46]		[0.30]	
p-value (equal coefficients)	0.077		0.352		0.105		0.033	
N observations	15167		9255		13988		5471	
N individuals	4805		3359		4968		2739	
Log-likelihood	–9223		–4742		–4432		–2771	

Notes: Estimates from random effects probit models with additional regressors. See text for details. All models also include controls for age, gender, household type, parental education, number of siblings, mother's age, whether living in a workless household, whether living in a low income household, housing tenure, migrant status of parents, year and region indicators. Marginal effects calculated at the sample means. P-value presents results from chi-squared tests of the null hypothesis that the estimated coefficient on the interaction between the unemployment rate and neither parent has a GCSE is equal to that between the unemployment rate and having at least one parent educated to degree level. Absolute t-statistics in brackets.

**Table 9: Impact of macroeconomic climate on educational attitudes and aspirations –
estimates from models with interactions with parental attitudes**

RE probit with additional regressors	Do well at school		Important to get GCSEs		Leave school at 16		Go to university	
	Coeff	ME	Coeff	ME	Coeff	ME	Coeff	ME
Unemployment rate * parents								
View GCSE as important	0.004	0.001	0.024	0.005				
	[0.32]		[1.87]					
Not view GCSE as important	–0.062	–0.023	–0.039	–0.014				
	[1.89]		[1.30]					
Unemployment rate * parents								
View A-levels as important					–0.020	–0.001		
					[0.94]			
Not view A-levels as important					–0.047	–0.008		
					[1.94]			
Unemployment rate * parents								
Want child to go to university							–0.000	–0.000
							[0.00]	
Not want child go to university							–0.075	–0.025
							[2.22]	
p-value (equal coefficients)	0.041		0.028		0.232		0.011	
N observations	7737		6345		6831		3939	
N individuals	1983		1975		1949		1864	
Log-likelihood	–4703		–3126		–1953		–1919	

Notes: Estimates from random effects probit models with additional regressors. See text for details. All models also include controls for age, gender, household type, parental education, number of siblings, mother's age, whether living in a workless household, whether living in a low income household, housing tenure, migrant status of parents, type of school (public vs private), parental attitudes to GCSEs/A Levels/university (as appropriate), year and region indicators. Marginal effects calculated at the sample means. P-value presents results from chi-squared tests of the null hypothesis that the estimated coefficient on the interaction between the unemployment rate and parents having positive attitudes to education is equal to that between the unemployment rate and parents not having positive attitudes to education. Uses BHPS data on parental attitudes to education collected at waves 12 and 17. Absolute t-statistics in brackets.

Appendix: Mean of explanatory variables by child's aspirations and attitudes

Variable	Doing well at school means a great deal		Getting GCSEs very important		Wants to leave school at 16		Wants to go to university	
	Yes	No	Yes	No	Yes	No	Yes	No
Unemployment rate	13.535	13.364	13.886	13.684	14.307	13.771	13.773	14.045
	3.814	*3.608*	*4.048*	*3.997*	*3.980*	*4.103*	*4.070*	*4.093*
Age 11	0.210	0.174	0.187	0.207	0.183	0.183	-	-
Age 12	0.219	0.219	0.210	0.223	0.192	0.213	-	-
Age 13	0.199	0.208	0.214	0.192	0.183	0.208	0.346	0.365
Age 14	0.199	0.211	0.209	0.190	0.216	0.211	0.345	0.345
Girl	0.508	0.471	0.503	0.466	0.333	0.526	0.539	0.385
Single parent household	0.198	0.245	0.200	0.239	0.257	0.197	0.195	0.269
Number of siblings	1.115	1.083	1.052	1.062	1.163	1.065	0.947	1.006
	1.035	*1.014*	*0.970*	*1.030*	*1.090*	*0.995*	*0.954*	*1.052*
Mother age/10	3.934	3.942	4.031	3.997	3.827	3.978	4.125	4.000
	0.808	*0.859*	*0.786*	*0.786*	*0.825*	*0.830*	*0.799*	*0.824*
Parent has degree	0.190	0.181	0.220	0.181	0.066	0.214	0.246	0.110
Workless household	0.137	0.164	0.125	0.161	0.250	0.119	0.116	0.194
Low income household	0.186	0.221	0.189	0.238	0.278	0.179	0.183	0.241
Parents in UK after age 15	0.016	0.008	0.008	0.009	0.006	0.014	0.011	0.006
Local authority tenant	0.215	0.247	0.186	0.217	0.385	0.188	0.173	0.254
Private tenant	0.056	0.065	0.066	0.076	0.062	0.059	0.067	0.071

Notes: Standard deviations in italics.