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Raising your sights: the impact of friendship networks on educational aspirations

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Abstract

We use a unique longitudinal dataset on an adolescent friendship network to evaluate variations on educational aspirations of young people from disadvantaged and middle income backgrounds. We evaluate whether such people who have friends from wealthier backgrounds have higher aspirations than otherwise similar young people without such links. The results suggest that there are such effects. Individuals from low income families with friends from high income families are 15.2% more likely to expect to stay in full time education after they finish compulsory school. We find similar effects for the educational aspirations and expectations of middle income children. These effects are quantitatively and statistically significant, and robust to the inclusion of a wide range of control variables. We also show that friend's mother's aspirations matter too. Having friends whose mothers hope they will go to university increases the wish to carry on full time education by 30% points. This is conditional on the young person's own mother's aspirations for her/him.

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1 Introduction

It has become increasingly fashionable for policy makers to cite low aspirations as one factor behind poor educational performance. There are certainly substantial differences in stated educational aspirations, with for example white boys from disadvantaged backgrounds generally having the lowest fraction wanting to stay in education beyond the minimum compulsory time. Studies also show that high aspirations are associated with high attainment in school, though obviously establishing causality is not straightforward (see Gregg and Washbrook; 2011; and the review in Portes et al.; 2010). Given this background, there is a search for policies to raise aspirations as one route to raise attainment. However, this is not straightforward as we do not have a fully articulated model of the formation of aspirations. Understanding the forces that influence aspirations may help the formation of better policies to raise the sights of students.

One factor sometimes discussed in an informal way is the importance of role models (Jodl et al.; 2001; Calvo-Armengol and Jackson; 2009). The idea is that people observe others whom they value, and thereafter aspire to be like them. This is very hard to formalise and test without any view of where the role models may be found. One potential source of role models for a young person is her set of friends. The growing literature on social networks emphasises that networks are transmitters of information and values (Jackson; 2010; Jackson and Yariv; 2010). In this paper, we use data on friendship networks to test a possible source of influence on aspirations.

We use a unique dataset on adolescent friendship networks that is embedded in a large scale birth cohort. This cohort gives us the life history of several thousand young people, born between April 1991 and December 1992 in and around the city of Bristol in the UK. We have very rich data, fully described below, on many aspects of the young people and their families, including their educational aspirations. We set up a questionnaire to seek the names of friends of the respondents in order to map the networks between them (see below and Burgess et al.; 2011, for further details). This yielded a network of over 14,000 links, of which we select a sample of almost 7,000 for this study.

As with all models of network effects, there is a problem of identification: how to distinguish the causal effect of the network on an individual from the (endogenous) choice to build that link in the first place. Our approach is to use the fact that we have longitudinal data and crucially that we know when the friendship was formed. In fact, in our data at least, a substantial fraction of the friendships are very long lasting. We use friendship links that were formed in primary school, so at least 3 years before the question on aspirations was put, and in many cases 5 or more years before. It seems implausible to argue that 8 and 9 year old children are forming friendships strategically to aid their future prospects (see Burgess et al.; 2011, for a discussion of homophily and the formation of friendships in this

data). It is not implausible to suggest that the parents of those children help them to form links that they believe are "useful" for life, but we can control for a range of attributes of both sets of parents (that is, the focus child's parents and the focus child's friend's parents) including their aspirations for their children. Whilst this is certainly not as clean an identification as could be achieved in experimental data, it seems a reasonable strategy to adopt in observational data in a real world friendship network.

We focus our attention on children from disadvantaged and middle income backgrounds, and ask whether such children who have friends from wealthier background have higher aspirations than otherwise similar children without such links. The results suggest that there are such effects. They are not very precisely measured but they are robust to the inclusion of a broad set of controls concerning the child, her/his parents and the parents of the friend.

The next section of the paper summarises the existing evidence on aspirations, and section 3 provides details of our data. Section 4 sets out the methodology, and section 5 presents our results. We finally offer some conclusions in section 5.

2   Background

Longitudinal studies across many disciplines[1] have shown that people with higher educational aspirations in adolescence achieve better educational and occupational outcomes in adulthood, and therefore, higher socioeconomic position (SEP)[2]. Early works on this association were developed in the late sixties and early seventies by Sewell et al. (1969) and Sewell and Hauser (1972). They introduced psychological measures in a model of status attainment for a cohort of high school students from Wisconsin (the "Wisconsin Model"). Their findings suggest that high aspirations, teachers' and parental encouragement, and friends' aspirations are associated with higher educational and occupational attainment, and earnings. Recent studies show that high teenage educational aspirations encourage educational attainment (Chowdry et al.; 2011) and produce better occupational outcomes (Schoon and Parsons; 2002). In contrast, low expectations stimulate risk behaviour and school dropout (Clark et al.; 2006). Among immigrants in Spain and the United States, aspirations are also a strong predictor of educational attainment and occupational success (Feliciano and Rumbaut; 2005; Portes et al.; 2010). These results are consistent with economic models which predict that non-cognitive skills and motivation are important determinants of success (Heckman; 2000; Cunha et al.; 2010). At the macroeconomic level, economic growth and development have been linked to aspirations since people would work hard to achieve

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[1]Including Sociology, Psychology and Economics.
[2]A comprehensive overview can be found in Portes et al. (2010) and Feliciano and Rumbaut (2005).

their aims. This behaviour outweighs the opposite effect of people giving up if they feel they cannot reach their goals (Bogliacino and Ortoleva; 2010).

Aspirations are motivated by different internal and external factors such as gender, age, ethnicity[3], abilities, talents, personality, academic performance, family SEP, and friends' and parental influence and behaviour (Gutman and Akerman; 2008). Parents play a key role in shaping the aspirations of their children as they provide information, resources and opportunities for them, as well as act as role models (Jodl et al.; 2001). Additionally, parental academic involvement increases their children's school performance (Gregg and Washbrook; 2011), inhibits behavioural problems and motivates higher aspirations in adolescence (Hill et al.; 2004).

Family SEP is also a strong determinant of aspirations, mainly because family income has an important impact on long term factors such as early cognitive development (Feinstein; 2003) and ability (Duncan and Brooks-Gunn; 2000; Cameron and Heckman; 2001). In the short term, low-income factors such as borrowing constraints might also affect educational outcomes (Dearden et al.; 2004) as individuals face difficulties affording educational costs. However, this short-run effects are less relevant to discourage people from reaching higher levels of education (Cameron and Heckman; 2001; Carneiro and Heckman; 2002; McCulloch and Joshi; 2002). Recent longitudinal studies in the United Kingdom (UK) have analysed the transmission mechanisms through which SEP affects educational attainment. They strongly emphasise the central role of parental and individual aspirations in this process (Goodman et al.; 2011; Dearden et al.; 2011; Gregg and Washbrook; 2011; Chowdry et al.; 2011).

It is undeniable that people select and influence each other through social interactions (Jackson; 2010). This influence has been analysed by a growing literature on social networks[4] and peer group effects. In networks, similarities among friends and changes in multiple dimensions of their behaviour and beliefs –such as risk behaviour, academic aspirations and performance, political identification, achievement beliefs, motivational beliefs, social preferences and behavioural problems– have been associated with both an intentional choice of friends (homophily selection) and their influence on each other (peer effects) (Kandel; 1978; Hamm; 2000; Altermatt and Pomerantz; 2003; French et al.; 2003; Wentzel et al.; 2004; Bearman and Moody; 2004; Fowler and Christakis; 2008). Positive peer effects on academic achievement have also been amply documented (see for example, Hanushek et al.; 2003; Atkinson et al.; 2008).

One of the contributions of the present study is that it joins together the two research areas discussed above, namely longitudinal studies with social networks, and also adds to the recent literature on SEP and educational inequalities. We evaluate how the SEP and

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[3]see also Bohon et al. (2006)
[4]A review of formal models of social influence, behaviour and diffusion can be found in Jackson and Yariv (2010) and Jackson (2008), Chapters 8-10.

aspirations of friends' parents affect the educational aspirations of individuals. We believe there are three possible mechanisms through which friends' parents can influence individuals: (i) indirectly, through their children friendships connections, (ii) indirectly, through the parents of their children's friends if they are friends among themselves (Carbonaro; 1998), (iii) or by direct contact with their children's friends. A recent work by Mora and Oreopoulos (2011) has attempted to evaluate peer effects on adolescent aspirations in Spain. This is the most relevant and similar work to ours. However, their data set is not longitudinal, just a cross section of a friendship network, which limits the correct identification of causal effects and confounds friendships selection with endogenous effects (Manski; 1995; Burgess et al.; 2011). In addition, their measure of adolescent aspirations is "intention to drop out" (high school), but this does not measure other dimensions of job or educational aspirations.

3   Data and Descriptive Statistics

The Avon Longitudinal Study of Parents and Children (ALSPAC) is a long-term study which aims to evaluate the health and development of a cohort born in the Avon area of England from 1st April 1991 to 31st December 1992. At 15-17 years old, they received a friendships questionnaire in which they were asked to nominate a maximum of five friends and to provide some information about their interaction (when they met, time they spend together, what they do together or talk about, etc., see Burgess et al. (2011) for a full description of the data). A total of 3,123 individuals completed the questionnaire (respondents) and each nominated on average 4.65 friends for a total of 14,503 friendship links, to 11,041 friends. Due to the survey design, not all nominated friends are part of the ALSPAC study, thus, it is possible that some respondents did not nominate any ALSPAC participant among their pool of friends. For this reason, the network of ALSPAC participants consists of 2,396 respondents, 4,572 friends (including respondents nominated as friends) and and 6,961 friendship links.

In this study we are interested in the 41% (2,854) of pre-secondary school friendships, formed when the respondent was younger than 132 months (11 years old). Our objective is to evaluate to what extent having friends from different income backgrounds, or whose mothers have different aspirations, affect their own educational aspirations. We want to capture the causal effects and not the selection effects of the network. For this reason, we select pre-secondary school friendships when the likelihood of strategic friendship fomation is smaller, and also, before our aspiration measures were taken. Therefore, we isolate selection effects of friendships. The variables we use are:

Individual aspirations: A questionnaire at 14 years old[5] asked ALSPAC participants

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[5] Previous research indicates that "*about age 14 adolescents begin to disregard occupations that are inconsistent with their values, competencies, and interests*" (Hill et al.; 2004; Cabinet Office Social Exclusion Task Force; 2008)

whether they will carry on or leave full time education at the age of 16 (when compulsory education ends). The questionnaire distinguished between their wish/desire (what they would like to do) and their perception (what they think they would actually do). They were also asked how important was having a job in which they can progress in a career. The answers to these three questions are our measures of educational aspirations. Table A3 contains the descriptive statistics of these variables.

Parental aspirations: These are mother's aspirations for her child's education, reported when the child was 9 years old. Three categories: **low**: if she hopes her child will get good GCSEs[6] and then leave full time education, **middle**: if she hopes her child will take at least one Advanced Level (A-level) qualification[7] or a similar qualification (other), and **high**: if she hopes her child will go to university. We create categorical variables for each of these levels.

Family income: Our measure of income is the log of the average of equivalised net household income when child was young (at ages 33 and 47 months), expressed in June 1995 prices[8]. All ALSPAC families[9] were divided into income quartiles (i.e. each representing 25% of income distribution). The second and third quartiles were grouped into one to create three income levels: Low (25%), medium (50%) and high (25%). This data is then merged into the friendships data. Higher and middle income families of respondents and friends are slightly overrepresented in this sample (as shown in Table A3 and Section 3.1).

Individual characteristics: gender, ethnicity, month of birth (scaled to September = 0), self esteem, locus of control (measured at 8 and 17 years old), and three categorical variables -reported by the mother- indicating whether the child believes school results, relationship with friends and money are important in life (sense of what is important).

Parental characteristics: Father's education (highest educational qualification, measured just prior to the childs birth: Certificate of Secondary Education/no qualifications, Vocational/O-level, A-level and Degree), mother's age at the child's birth (dummies for: less than 20; 20-24; 25-29; 30-34; 35 or more), employment status of parents at when child was young (four years old), the mother's rating of whether school was a valuable experience for her (5-point scale, standardized to unit variance); the amount and quality of mother-child

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[6]High stakes exams at the end of compulsory schooling.

[7]A-levels are studied over a two year period. They are also used as the standard entry qualification for assessing applicants who want to take academic courses at universities in England, Wales and Northern Ireland.

[8]Income data from the ALSPAC data is banded. A median value for each band using data from the Family Expenditure Survey was imputed to convert the income variables to real values using the 1995 RPI as a base, and then equivalise using the OECD modified scale. We also impute the value of housing benefit for families who do not directly receive housing payments. Finally, we average over the two measures to reduce measurement error and take the log of the variable.

[9]Income data is available for a sample of 9,762 households to 9,888 ALSPAC children born between 1st April 1991 and 31st December 1992.

educational interactions (eight 5-point items such as, helps with homework and draws or paints with child, standardized and averaged), and other mother-child non-educational interactions (nine 5-point items such as takes child to the park and does active play with child, standardized and averaged) – see Gregg and Washbrook (2011) for further details.

3.1 Sample definition

Our unit of observation is the individual, not the friendship link. Therefore, we create a data set of 1,650 observations, one for each respondent who nominated at least one ALSPAC pre-secondary school friend. We take each respondent and classify their friends' family income and friend's mother's aspirations in three categories: (i) **High** if at least one of their friends falls in the highest level for each parental variable (i.e. high family income/high parental aspirations); (ii) **Middle** if at least one of their friends belongs to the middle level, but none to the highest one; and (iii) **Low** if all their friends fall in the lowest level[10].

We remove the observations with missing values for any of the variables described in Section 3, the final sample size is 699 observations. 47% of respondents in our sample nominated at least two primary school friends with no missing data (Table A1). 92% of them reported that they would like to carry on full time education after finishing compulsory education (year 11 - 16 years old). 90% believed they will continue in full time education after years 11, and 83% considered that having a job in which they can progress in a career is very important (Table A3). 62% of our respondents are female and 1.3% are non-white.

3.2 Descriptive statistics

On average, our respondents obtained higher KS2 scores than the full sample of ALSPAC participants. They also have lower locus of control scores indicating that they tend to be more internal-type individuals, who believe that an outcome is largely the result of their own behaviour or actions. Mothers who feel that school was valuable experience are over-represented in our sample. High income parents are also over-represented. The proportion of families in this category is higher than the upper quartile of the distribution, for both respondents (33%) and friends (30%). The proportion of mothers with high aspirations (child going to university) is the same (63%) for both respondents and friends. The aspirations of friends' mothers are slightly higher than respondents' mothers, as a higher proportion of

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[10]*Income*: (i) **High** if at least one of their friends is from a high income family; (ii) **Middle** if at least one of their friends belongs to a middle income family but none to a high income family; and (iii) **Low** if all their friends are from low income families. *Friend's mother's aspirations*: (i) **High** if at least one of their friends' mothers hopes her own child will go to university; (ii) **Middle** if at least one of their friends' mothers hopes they will take at least one A-level or will get a similar qualification, but will not go to university; and (iii) **Low** if all their friends' mothers hope they will get, at most, good GCSEs.

them expect their children will get at least an A level or a similiar qualification (33% vs 31%), while less (4% vs 6%) hope they will just achieve good GCSEs (Table A3).

We create nine exclusive categories that combine family income and maternal aspirations of respondents and their friends (see Table A2)[11]. We plot the mean value of the educational aspirations indicator of the respondent for each category, starting from the lowest one, i.e. low:low (Graphs 1 and 2). If friends' parents influence individual's aspirations we expect that the third bar in each each level of own family income or maternal aspirations is higher than the previous two. This is the case for most aspirations indicators in the two lower levels of own family income and mother's aspirations. Children from low income families with high income friends report a higher probability of wishing (89%) and expecting (89%) to carry on full time education after finishing compulsory school (year 11). They are also more likely to think that having a job in which they can progress in a career is very important (80%). Note that most of these magnitudes are higher for the low:high category than for the mid:low, suggesting that friends' parental SEP and aspirations might significantly influence individual's aspirations in both ways.

We find a similar pattern by mother's aspirations. On average, the proportion of respondents who would like and expect to carry on full time education is higher the higher the level of their friend's mother's aspirations, at each level of of their own mother's aspirations. In addition, teenagers whose mother's aspirations are low or middle and who have friends with high aspirational mothers have higher aspirations, on average, than those in a higher category with friends whose mother's aspirations are low (compare bars low:high and mid:low, and, mid:high and high:low). For the third indicator of aspirations (Having a job in which they can progress in a career is very important) we do not observe this pattern. All individuals in the first category (only four observations) think that having that type of job is *very* important. The differences for the rest of the categories is very subtle except in the case of mid:low and mid:mid, which are disproportionally low or high.

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[11]In order to make the categories fully exclusive we created low:high, mid:high and high:high first. They indicate whether at least one friend is from the highest category either for family income or friends' mother's aspirations. Then, each category was consecutively created excluding the previous ones as follows: low:mid, mid:mid, high:mid and low:low, mid:low, high:low. Therefore, all "-:low" categories imply all of friends are from the lowest category (either family income or parental aspirations), and all "-:mid" categories imply that at least a friend belongs to the middle category, but none to the highest one.

4 Methodology

We evaluate the influence of friends' families and background on individual educational aspirations, by estimating the following model,

$$
\begin{aligned}
A_i =& \alpha + \beta_1 \, FPhigh_i + \beta_2 \, FPmid_i + \beta_3 Pmid_i \times FPhigh_i + \beta_4 Plow_i \times FPhigh_i \\
& + X_i + Z_{i_{parents}} + \varepsilon_i
\end{aligned}
\tag{1}
$$

in which A_i is an aspiration indicator of young person i, as described in Section 3. $Pmid_i$ and $Plow_i$ indicate whether the young person i belongs to a middle or low income family. $FPhigh_i$ takes value of 1 if at least one of their friends belong to a high income family. $Pmid_i \times FPhigh$ and $Plow_i \times FPhigh$ are interactions of these variables. Hence, they indicate whether the individual, either from a middle or low income background, has at least one friend from a high income family. β_3 and β_4 are the coefficients of interest and would measure differences in the aspirations of individuals from lower categories when they make friends from the highest category. $FPmid_i$ takes value of 1 if at least one of their friends belongs to a middle income family but none to a high income family. We do the same for mother's aspirations. X_i and Z_i are vectors of individual and parental characteristics as described in section 3, and include own parental income and parental aspirations. Equation (1) is estimated by OLS (linear probability model).

We also add school fixed effects (SFE) to control for common external factors that individuals and their friends might have been exposed to, within the school and its surroundings. Adding SFE is important because most friends (78%) in our sample attend the same school as the respondent. In addition, students are not randomly allocated to schools in England, therefore, there is considerable social sorting across schools. SFE are characterized by γ_s in Equation (2) and the model is estimated when at least five individuals in our sample attend each school.

$$
\begin{aligned}
A_{is} =& \alpha + \beta_1 \, FPhigh_{is} + \beta_2 \, FPmid_{is} + \beta_3 Pmid_{is} \times FPhigh_{is} + \beta_4 Plow_{is} \times FPhigh_{is} \\
& + X_{is} + Z_{is_{parents}} + \gamma_s + \varepsilon_{is}
\end{aligned}
\tag{2}
$$

5 Results

5.1 Friends' Family Income

Estimates from the linear probability model (Equation 1 - Table 1) indicate that having a friend from a high income family, *per se*, does not affect educational aspirations of people. Only individuals from a lower income background have raised aspirations by being friends with a person from a high income family. This is especially true for middle income people who are 9.3% points more likely to wish and 12% points more likely to expect to stay in full time education after they finish compulsory school. Similarly, the expectations of low income children to continue in full time education is higher by 15.2% points when they have at least one friend from a high income family. Their desire to stay in full time education also seems to be higher as the coefficient is positive (6.4%) but not significant. We do not find significant income effects on considering having a job in which they can progress in a career as very important. The coefficients of income interactions are negative but non-significant.

Being from a middle income family lowers individual's level of aspirations compared to high income people. The coefficients are negative (-0.043 and -0.053) and significant at 10%. Note that all teenagers in this category have friends from middle or low income families. So, this result might capture an additional negative effect, in case that having low income friends decrease individual's aspirations.

When controlling for unobserved heterogeneity at the school level, most of the coefficients of staying in full time education increase. This is particularly true for the perception of low and middle children with high income friends for carrying on in full time education after year 11. Such perception increases to 20.3% and 14.4% for low and middle income teenagers, respectively. In terms of desire, the coefficient for low income individuals increase slightly, but remain insignificant, while the magnitude of middle income individuals remain almost unchanged.

Interests of having a job in which they can progress in a career are much higher (and positive) for low income individuals, although the coefficient remain insignificant (0.112). The magnitude of the other negative coefficients also increase (become less negative) after controlling for SFE.

5.2 Mother's aspirations

Mothers with high aspirations for their children might contribute to develop high aspirations on their children's friends. The estimates of Model (1) (Table 3) for the two top categories of mother's aspirations are high (and significant) comparing with the omitted category (low). Having friends whose mothers hope they will go to university or will get at least an A

level increases the wish to carry on full time education by 30% points. The perception of continuing on full time education is also high (27% points), although the coefficients are only weakly significant (at 10%).

When we add controls for school common unobservable factors (SFE), the coefficients are slightly lower but still significant. The rest of the coefficients show the correct sign, as it is expected that children of lower aspirations mothers are less motivated to stay on full time education after finishing compulsory school. However, all of them are not significant.

5.3 Covariates

We control for individual and parental characteristics in all models. Table A4 shows the coefficients of those controls for the family income linear probability model (Table 1)[12]. We find that aspirations and expectations of girls and non-whites are higher as previous literature suggest (Gutman and Akerman; 2008). Academic performance is also a very important determinant of high aspirations. Children with higher KS2 scores by 1 standard deviation are 0.7% more likely to wish and 0.8% to expect to carry on full time education. Parental education and involvement also encourage high aspiration levels as we find positive effects of father's education and mum-child educational interactions in childhood (9 years old) on all three aspirations variables.

6 Conclusions

This paper contributes some new evidence to the discussion on the educational aspirations of children from disadvantaged families. Policies to raise aspirations are handicapped to a degree by an incomplete understanding of the forces shaping the aspirations of young people. We have taken the line that one major factor might be the circumstances and attitudes of friends. We exploit a new and unique dataset on we collected on adolescent friendship networks, embedded in a large scale birth cohort in the UK. We argue that the longitudinal nature of this data plus our knowledge of the length of friendships and the rich set of controls gives us a good chance to identify a causal effect of the network.

We find that young people from low income families with friends from high income families have higher educational expectations and aspirations than similar young people from low income families without such friends. This effect is quantitatively and statistically significant, and robust to the inclusion of a wide range of control variables. We also show that for a young person, the aspirations for her own child of the young person's friend's mother matter too. This is conditional on the young person's own mother's aspirations for her/him. This

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[12]These results are very similar for all models. Full results available upon request.

result suggests that young people's aspirations are amenable to change. The circumstances and values of their good (long-lasting) friends do appear to modify their own aspirations. Broadening this out, it seems that probably implicit messages from trusted sources do matter. While it seems unlikely that there are direct policy implications in terms of influencing friendship formation, the results do provide some hope that messages on aspirations might have weight if carefully crafted. It also raises the policy importance of further understanding friendship formation (which we discuss in Burgess et al.; 2011). Finally, the result suggests that providing contexts - in this case schools - where children of different social classes can meet and potentially befriend each other may have later implications for the aspirations of disadvantaged children. This is part of the case for comprehensive schools, not selective or otherwise segregated schools.

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Graphs and Tables

Figure 1: Aspirations by parents' income (Resp:Friend) - at least one friend

(a) Carry on full time educ after year 11 (desired) - @14

(b) Carry on full time educ after year 11 (perception) - @14
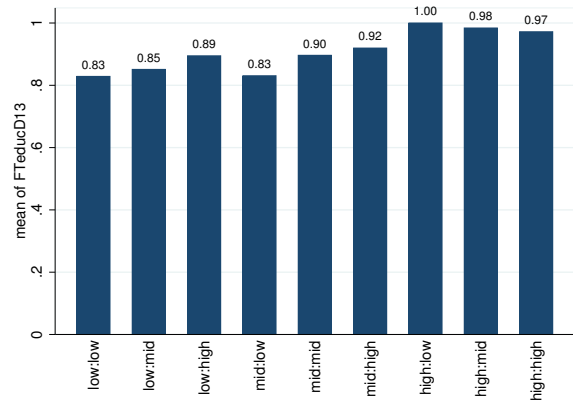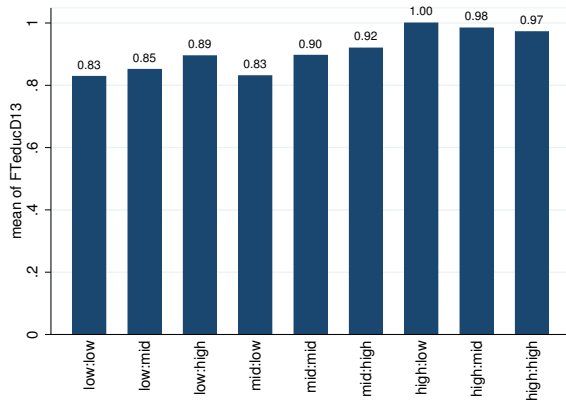
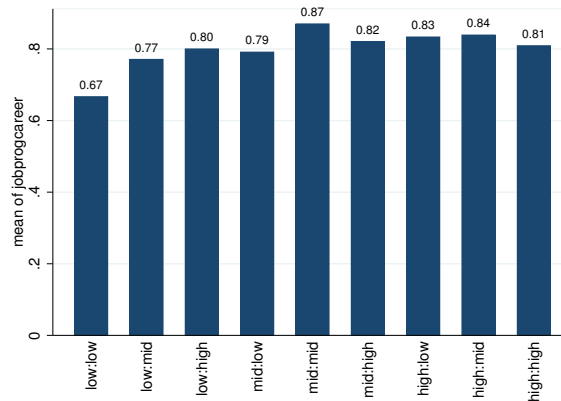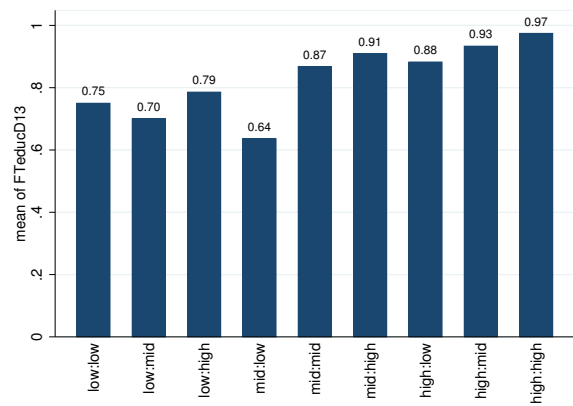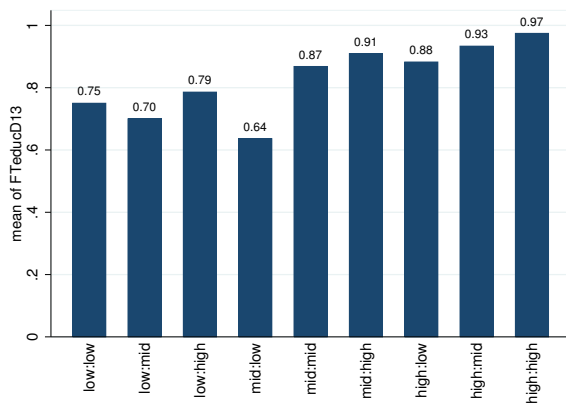(c) Having a job in which they can progress in a career is **very** important - @14

Figure 2: Aspirations by mothers' aspirations (Resp:Friend) - at least one friend

(a) Carry on full time educ after year 11 (desired) - @14

(b) Carry on full time educ after year 11 (perception) - @14

(c) Having a job in which they can progress in a career is **very** important - @14
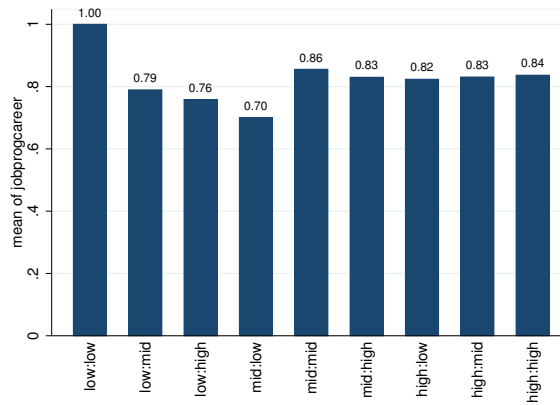
Table 1: Family income - OLS

	Full Time educ (14) *Desired*	**Full Time educ (14)** *Perception*	**Job progress in a career important**
Friend's Parental income (High)	0.010	-0.013	0.100
	[0.054]	[0.062]	[0.089]
Friend's Parental income (Middle)	0.055	0.039	0.063
	[0.053]	[0.054]	[0.067]
Par inc (middle) * Frd Par inc (High)	0.093*	0.119*	-0.093
	[0.037]	[0.045]	[0.082]
Par inc (low) * Frd Par inc (High)	0.064	0.152*	-0.024
	[0.104]	[0.076]	[0.141]
Parental income (Middle)	-0.043†	-0.053†	0.04
	[0.023]	[0.028]	[0.056]
Parental income (Low)	-0.022	0.009	-0.009
	[0.059]	[0.055]	[0.083]
N	524	527	519

* Significant at 5%. †Significant at 10%

Table 2: Family income - School FE

	Full Time educ (14) *Desired*	**Full Time educ (14)** *Perception*	**Job progress in a career important**
Friend's Parental income (High)	0.059	-0.008	0.073
	[0.072]	[0.077]	[0.114]
Friend's Parental income (Middle)	0.113	0.084	0.016
	[0.071]	[0.070]	[0.060]
Par inc (middle) * Frd Par inc (High)	0.091*	0.144*	-0.042
	[0.040]	[0.047]	[0.107]
Par inc (low) * Frd Par inc (High)	0.07	0.203*	0.112
	[0.127]	[0.097]	[0.170]
Parental income (Middle)	-0.038†	-0.045	0.012
	[0.022]	[0.030]	[0.076]
Parental income (Low)	-0.027	0.019	-0.008
	[0.070]	[0.072]	[0.119]
N	455	456	444
N (Sch)	40	40	39

* Significant at 5%. †Significant at 10%

Table 3: Mother's aspirations - OLS

	Full Time educ (14) Desired	Full Time educ (14) Perception	Job progress in a career important
Friends' Mother's hopes for child's ed (High)	0.302*	0.268†	0.169
	[0.141]	[0.143]	[0.166]
Friends' Mother's hopes for child's ed (Middle)	0.298*	0.267†	0.135
	[0.141]	[0.143]	[0.166]
Moth asp (middle) * Frd Moth asp (High)	-0.009	-0.003	-0.018
	[0.062]	[0.067]	[0.083]
Moth asp (low) * Frd Moth asp (High)	-0.23	-0.079	-0.269
	[0.201]	[0.184]	[0.182]
Mother's hopes for child's ed (Middle)	-0.04	-0.043	0.031
	[0.053]	[0.058]	[0.075]
Mother's hopes for child's ed (Low)	-0.019	-0.014	0.133
	[0.136]	[0.136]	[0.108]
N	499	501	493

* Significant at 5%. †Significant at 10%

Table 4: Mother's aspirations - School FE

	Full Time educ (14) Desired	Full Time educ (14) Perception	Job progress in a career important
Friends' Mother's hopes for child's ed (High)	0.298*	0.247†	0.167
	[0.120]	[0.128]	[0.164]
Friends' Mother's hopes for child's ed (Middle)	0.281*	0.236†	0.117
	[0.122]	[0.138]	[0.153]
Moth asp (middle) * Frd Moth asp (High)	-0.013	-0.007	-0.053
	[0.067]	[0.064]	[0.072]
Moth asp (low) * Frd Moth asp (High)	-0.271	-0.153	-0.333
	[0.221]	[0.206]	[0.217]
Mother's hopes for child's ed (Middle)	-0.055	-0.045	0.067
	[0.068]	[0.065]	[0.066]
Mother's hopes for child's ed (Low)	0.071	0.083	0.211
	[0.166]	[0.165]	[0.143]
N	426	426	415
N (Sch)	40	40	39

* Significant at 5%. †Significant at 10%

Appendix

Table A1: Number of primary school friends

No. of nominated friends	No. of respondends	%	No. of respondends (non missings)	%
1	886	53.7	370	52.9
2	465	28.2	191	27.3
3	187	11.3	92	13.2
4	83	5.0	29	4.1
5	29	1.8	17	2.4
Total	**1,650**	**100.0**	**699**	**100.0**

Table A2: Respondents and friends - family income and mother's aspirations

	Category [1]	Resp.	Friend	Family income		Mother's aspirations	
				N	**%**	**N**	**%**
1	low:low	Low	Low	45	3.97	5	0.47
2	low:mid	Low	Middle	103	9.09	23	2.15
3	low:high	Low	High	44	3.88	36	3.36
4	mid:low	Middle	Low	71	6.27	12	1.12
5	mid:mid	Middle	Middle	331	29.21	103	9.62
6	mid:high	Middle	High	195	17.21	221	20.63
7	high:low	High	Low	14	1.24	17	1.59
8	high:mid	High	Middle	134	11.83	146	13.63
9	high:high	High	High	196	17.3	508	47.43
	Total			1,133	100	1,071	100

Figures based on the full sample of 1650 respondents (without removing observations with missing values, as we are interested in graphical correlations.).

[1] All these categories are exclusive. Low:high, mid:high and high:high were defined first, so at least one friend is from the highest category (either family income or mother's aspirations). Then, each category was consecutively created excluding the previous ones as follows: low:mid, mid:mid, high:mid and low:low, mid:low, high:low. Therefore, all "-:low" categories imply all of friends are from the lowest either income or paternal aspirations, and all "-:mid" categories imply that at least a friend belongs to the middle category, but none to highest one.

Table A3: Descriptive Statistics

Variable	Description	Obs	Mean	Std.Dev.	Min	Max
FTeducD14	Carry on full time educ after year 11 (desired) - @14	663	0.919	0.274	0	1
FTeduc14	Carry on full time educ after year 11 (perception) - @14	669	0.903	0.296	0	1
jobprogcareer	having a job in which they can progress in a career is VERY important	660	0.830	0.376	0	1
female	Female	699	0.618	0.486	0	1
ethn	Ethnicity: non-white	699	0.013	0.113	0	1
mbirth	Childs month of birth (Sept=0)	699	5.084	3.617	0	11
k2avg	KS2 score	699	105.8	7.051	71.0	113.6
chlocus	Locus of control @8y	699	99.3	10.055	71.2	124.1
teenlocus17	Locus of control @17y	699	99.4	9.804	84.9	136.8
magebth	Mother's age at birth	699	29.8	4.162	17.0	44.0
daded	Father's education	699	2.685	0.985	1	4
dadempst4	Father's empl status @ 47m	699	0.959	0.200	0	1
mumempst4	Mother's empl status @ 47m	699	0.622	0.485	0	1
schimp	Child considers school results important in life	699	0.639	0.480	0	1
relfrdimp	Child considers relationship with friends important in life	699	0.913	0.282	0	1
moneyimp	Child considers money important in life	699	0.323	0.468	0	1
mvaluesch	Mum feels school was valuable (std)	699	0.219	0.888	-3.18	1.22
medints9	Mum-child educational interactions at 9 (av std)	699	0.002	0.523	-3.66	1.43
mnonedints9	Mum-child non-educational interactions at 9 (av std)	699	0.000	0.469	-2.39	1.56
Pinc1	Parental income (High)	699	0.335	0.472	0	1
Pinc2	Parental income (Middle)	699	0.542	0.499	0	1
Pinc3	Parental income (Low)	699	0.123	0.329	0	1
FPinc1	Friends' Parental income (High), average	549	0.299	0.409	0	1
FPinc2	Friends' Parental income (Middle), average	549	0.561	0.438	0	1
FPinc3	Friends' Parental income (Low), average	549	0.140	0.313	0	1
Pasp1	Mother's hopes for child's ed at 9 - High (Uni)	699	0.629	0.483	0	1
Pasp2	Mother's hopes for child's ed at 9 - Middle	699	0.312	0.464	0	1
Pasp3	Mother's hopes for child's ed at 9 - Low (GCSE)	699	0.059	0.235	0	1
FPasp1	Friends' Mother's hopes for child's ed at 9 - High (Uni), average	523	0.626	0.438	0	1
FPasp2	Friends' Mother's hopes for child's ed at 9 - Middle, average	523	0.333	0.424	0	1
FPasp3	Friends' Mother's hopes for child's ed at 9 - Low (GCSE), average	523	0.041	0.166	0	1

Table A4: Covariates

	Full Time educ (14) *Desired*	**Full Time educ (14)** *Perception*	**Job progress in a career important**
Female	0.073*	0.059*	-0.048
	[0.027]	[0.028]	[0.035]
Ethnicity: non-white	0.075	0.041	0.196*
	[0.059]	[0.048]	[0.064]
Childs month of birth (Sept=0)	0.003	0.004	-0.006
	[0.003]	[0.004]	[0.005]
KS2 score	0.007*	0.008*	0.000
	[0.002]	[0.003]	[0.003]
Locus of control @8y	0.000	-0.001	0.000
	[0.001]	[0.001]	[0.002]
Locus of control @17y	0.001	0.002	0.001
	[0.001]	[0.001]	[0.002]
Mother's age at birth	0.001	0.005	-0.007
	[0.003]	[0.003]	[0.004]
Father's education	0.044*	0.036*	0.016
	[0.013]	[0.014]	[0.018]
Father's empl status @ 47m	0.058	0.073	-0.07
	[0.075]	[0.072]	[0.089]
Mother's empl status @ 47m	0.024	0.044	-0.031
	[0.026]	[0.028]	[0.035]
Child considers school results	0.009	0.021	-0.005
important in life	[0.025]	[0.027]	[0.038]
Child considers relationship with	0.01	-0.032	0.04
friends important in life	[0.048]	[0.044]	[0.068]
Child considers money important in life	0.005	0.024	-0.047
	[0.025]	[0.026]	[0.038]
Mum feels school was valuable (std)	0.013	0.01	-0.043*
	[0.014]	[0.015]	[0.020]
Mum-child educational interactions at 9	0.044	0.062†	0.070†
	[0.029]	[0.033]	[0.041]
Mum-child non-educational interactions at 9	-0.027	-0.035	0.005
	[0.031]	[0.033]	[0.049]
Constant	-0.166	-0.635	1.436
	[0.680]	[0.747]	[1.060]
N	524	527	519

* Significant at 5%. †Significant at 10%