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To cite this article: Kirstine Hansen, Morag Henderson & Nikki Shure (2022): The role of academic self-concept in post-compulsory achievement, transitions and labour market outcomes, Cambridge Journal of Education, DOI: [10.1080/0305764X.2022.2097644](https://doi.org/10.1080/0305764X.2022.2097644)

To link to this article: <https://doi.org/10.1080/0305764X.2022.2097644>



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Published online: 09 Aug 2022.



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# The role of academic self-concept in post-compulsory achievement, transitions and labour market outcomes

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## ABSTRACT

Pupils' Academic Self-Concept (ASC) has been shown to be related to educational outcomes during compulsory school years, but there is little evidence on the role ASC plays beyond this stage. Using longitudinal data from the English Next Steps survey the authors examine whether young people with higher ASC are more likely to study A levels, participate in further education and attend university. For university attenders, they examine whether higher ASC is associated with attending high status universities or studying higher status subjects. Finally, they explore the relationship between ASC and employment status and income. They find ASC is associated with differences in some of the post-educational routes but not with all. ASC is associated with an increased likelihood of studying for A levels and, for those with the highest ASC, more ASC increases the likelihood of going to university. However, there is no evidence that ASC is associated with going to an elite Russell Group university or related to differences in subjects studied at university, nor is it directly associated with later labour market outcomes once background variables and prior educational attainment are included. However, there will be an indirect relationship which should not be overlooked, as ASC influences A levels and the likelihood of going to university, both of which are associated with improved labour market outcomes. Although not causal, this work suggests that policies aimed at increasing ASC might have the ability to improve students' educational trajectories, increasing the likelihood that students will study A levels and, for some, increasing the likelihood of attending university. Both of these are pivotal educational cross-roads, so influencing routes at these points not only has the potential to improve opportunities for individuals, but also widen access to HE among groups with traditionally lower participation rates, thereby improving later outcomes, indirectly.

## ARTICLE HISTORY



Received 26 November 2020  
Accepted 21 June 2022

## KEYWORDS

Academic Self-Concept;  
higher education  
participation; labour market  
outcomes

## Introduction

Academic Self-Concept (ASC), the way a student perceives their academic ability, has been shown to be a predictor of both academic achievement (Guay, Marsh, & Boivin, 2003; Hansen & Henderson, 2019; Marsh, 1990; Marsh, Byrne, & Yeung, 1999, 2002; Strand, 2014) and academic progression (Strand, 2014) during the stages of compulsory

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education. But whether it contributes to post-compulsory participation and achievement is a more contested issue (Chevalier, Gibbons, Thorpe, Snell, & Hoskins, 2007). Indeed, relatively little has been done to explore the lasting effect of academic self-concept on later educational transitions and movement into the labour market despite the fact that Marsh and Craven (2006) identified a reciprocal relationship between ASC and ability/achievement that suggests ASC may play an important role in these later stages. This paper seeks to address this gap by using data from Next Steps to examine the role academic self-concept plays in progression through post-compulsory education and into the labour market. More specifically we ask: controlling for other factors, is having a greater belief in your own academic ability associated with more advantaged post-compulsory educational trajectories and more positive labour market outcomes? If it is, targeting academic self-concept may offer policy makers interested in reducing attainment gaps in post-compulsory education, participation gaps in higher education (HE), and labour market inequalities later in life an opportunity for intervention that may be less burdensome than influencing the structural factors that contribute to these gaps and inequalities, such as parental income, social class or education.

### **Educational trajectories post compulsory schooling**

Prior to 2015, and for the cohort of young people examined in this paper, compulsory education culminated at age 16 when pupils took General Certificate of Secondary Education (GCSE) exams in England, Wales and Northern Ireland.<sup>1</sup> Those who performed badly were likely to leave education, while those who performed better stayed on at school gaining further qualifications. The majority of those who achieve five grade A\* to C GCSEs including maths and English pursue a level 3 qualification at age 17, with the majority studying A levels, the traditional access route to later university study.<sup>2</sup> Gaining level 3 qualifications not only has greater returns in the labour market, but also allows students to access routes to higher education with even greater returns. Those who perform less well at GCSEs tend to remain studying level 2 qualifications post age 16, and around half progress no further up the educational ladder (Hupkau, McNally, Ruiz-Valenzuela, & Ventura, 2016). This pathway offers poorer prospects and lower returns than level 3 qualifications (Dearden, McGranahan, & Sianesi, 2004). Moreover, without level 3 qualifications pathways to higher education are blocked. This is important because a university degree is considered the key to achieving economic success and other associated positive outcomes later in life, such as higher earnings (Chevalier, 2011; De Vries, 2014, p. 5; Walker & Zhu, 2013), access to professional careers (De Vries, 2014; Macmillan, Tyler, & Vignoles, 2014), good health and life satisfaction (Oreopoulos & Petronijevic, 2013).

Because higher education offers much better opportunities in later life, academics and policy makers have long been interested in equalising access to HE and encouraging groups with traditionally lower participation rates into HE (Chowdry, Crawford, Dearden, Goodman, & Vignoles, 2013; Gorard, 2006). However, evidence shows that there has been little change in the ascribed characteristics of young people attending university despite the expansion of the higher education landscape in the UK post-1992 (Boliver, 2011), with some evidence indicating that the expansion actually widened participation gaps between rich and poor children (Blanden & Machin, 2004). Despite

changes it remains the case that progression from one level of education to another has been shown to be contingent on a number of factors, including demographic characteristics such as ethnicity (Boliver, 2016) and gender (Broecke & Hamed, 2008),<sup>3</sup> familial resources and socio-economic status (Blanden & Machin, 2004; Chowdry, Crawford, Dearden, Goodman, & Vignoles, 2010; Raffe, Croxford, Iannelli, Shapria, & Howieson, 2006).

Recent work in this field has focused on the role that non-cognitive skills or socio-emotional characteristics play in accounting for differences in educational achievement and progression, as well as labour market outcomes (Heckman, Stixrud, & Urzua, 2006; Borghans, Duckworth, Heckman, & Ter Weel, 2008; Almlund et al. 2011; Burnello & Schlotter 2011; Gensowski 2014). Socio-emotional characteristics can be defined in a number of ways and encompass a number of different characteristics including personality traits (such as the Big Five: openness, agreeableness, conscientiousness, neuroticism and extraversion); the degree to which an individual attributes their successes or failures to themselves or others (e.g. Rotter's measure of locus of control); and measures of self-esteem, motivation, time management and emotional regulation.

In this paper we focus on one of these non-cognitive skills, academic self-concept (ASC), and the role ASC plays in post-compulsory educational transitions. Evidence suggests that in general, young people tend to overestimate their skills (Falchikov & Boud, 1989), both in absolute terms and relative to their peers. But ASC varies by a person's social demographic characteristics such as gender (Hansen & Henderson, 2019) and ethnicity (Strand, 2014); family background characteristics (Correll, 2001; Chevalier et al., 2007; Hansen & Henderson, 2019; Sullivan, 2006) and the schools they attend (Sullivan, 2006; Chevalier et al., 2007;).

ASC has been found to be related to academic outcomes and progression in a number of countries. In the UK, Strand (2014) uses the Longitudinal Study of Young People in England (Next Steps) to examine a range of factors that might account for gender, ethnic and SES gaps in academic achievement and academic progress between the ages of 11 and 16. He finds that students' ASC is positively related to progression and achievement and is one of the most important factors in accounting for observed gaps. Chowdry, Crawford, and Goodman (2011), like Strand, make use of Next Steps to identify explanations for the socio-economic attainment gap. They find that a young person's belief in their academic ability at age 14 is positively and strongly associated with attainment at age 16. More recently, using the same data, Hansen and Henderson (2019) find a positive and significant association between ASC and GCSE outcomes at age 16. When they examine similar ability pupils at the top and bottom of the prior ability distribution, they show that both high and low attainers have higher probabilities of achieving five A\*-C GCSEs and higher GCSE point scores on average if they have higher ASC than similarly able students who have lower self-concept. But in addition, they find the penalty for lack of ASC at the top end is greater than the advantage of high self-concept at the bottom end of the ability distribution.

In Canada, Guay et al. (2003) show an association between ASC and academic achievement amongst 8–10 year olds in Quebec; Marsh et al. (1999) find the same association amongst high school students in Ottawa in grades 9–12, while for the rest of Canada, Marsh (1990) finds that ASC measured in grade 10/11 (age 15/16) is significantly related to achievement in grades 11/12 (aged 16/17). Marsh et al. (2002)

also find an association between ASC and achievement amongst a nationally representative sample of students in Hong Kong. Suárez-Álvarez et al (2012) also find this amongst grade two students (aged seven to eight) in Spain.

In a number of different studies, Marsh and his co-authors (Marsh et al., 1999; Marsh & Craven, 2006; Marsh & O'Mara, 2008; Marsh & Yeung, 1997) argue that academic self-concept and achievement are mutually reinforcing, each leading to gains in the other. This hints at a relationship between ASC and longer term post-compulsory educational transitions and gives us reason to believe that ASC may not only play an important role in achievement and progression through compulsory schooling, but may also be able to account for movements through post-compulsory schooling, into higher education and finally into the labour market (Almlund et al., 2011; Borghans et al., 2008).

There are many routes through which this might work. Post-compulsory education involves individual choices about whether to take A levels, what subjects to study, where to go to university, which university to attend and which course to take. These decisions have consequences for the trajectories young people find themselves on through education and ultimately for the opportunities available to them in the labour market. These choices will be based to some extent on academic ability and, as we have seen earlier, because ASC is related to better GCSE outcomes, we would expect this to increase the number of pupils gaining the pre-requisite grades to pursue A level study. This could open up a more advantaged educational trajectory to those students on the margins.

In this paper we are interested in whether ASC contributes to more advantaged trajectories and outcomes over and above academic ability, so if ASC produces greater confidence in one's ability to succeed in HE, we may expect this to pull a student towards a more advantageous pathway, for example. Or perhaps the confidence will result in a choice of harder subjects at A level which are regarded more highly by universities, or a choice of a more prestigious subject at a higher status university.

Moreover, because research by Strand (2014) and Hansen and Henderson (2019) has shown that ASC has the ability to reduce structural attainment gaps, we might expect ASC to affect the educational and labour market opportunities of young people from groups with traditionally lower rates of HE participation. In such instances ASC may be able to reduce inequalities in education and employment that already exist due to demographic and family background factors which influence achievement.

There is little empirical evidence that looks directly at the role of ASC and later life outcomes, and what there is, is inconclusive. Chevalier et al. (2007) shows that in England student perception of their maths ability at age 15 is positively related to the expectation of attending university independent of other factors such as social class. They also find that higher ASC amongst a group of first year undergraduates in the UK is associated with a higher probability of expecting success in both the first year and in the final degree classification, but find little relationship between ASC and expected returns in later life. In Australia, Marks et al. (2001) find that ASC is related to scores for admission to HE, while using German data, Parker, Marsh, Lüdtke, and Trautwein (2013) find ASC in maths is not associated with attending university, but is related to studying a STEM subject at university.

In this paper we examine whether ASC is related to participation in post-compulsory education and achievement, once prior attainment and background characteristics are taken into account. In other words, controlling for other characteristics and prior ability,

are young people with higher academic self-concept more likely to take A levels and attend HE directly due to their academic self-concept? Do students with higher ASC make different choices about where and what to study than similar ability students with less ASC? Are students with higher levels of ASC more likely to find employment and earn more in the early years of their careers? If the answer to any of these questions is yes, then ASC would contribute to post-compulsory participation and achievement gaps, unequal access to HE and differential opportunities in the labour market with which academics and policy makers are so concerned. This may offer policy makers a tangible target for reducing post-compulsory educational inequalities which have been found to be important in determining educational and career pathways throughout life.

Drawing on both the achievement literature and the ASC literature we build analytical models which allow us to examine the relationship between ASC and progression through the educational pathways in England. Using data from the Next Steps survey, we address a number of research questions including:

To what extent does ASC influence the likelihood of:

- studying for A levels;
- studying vocational qualifications in a further education (FE) institution;
- studying for a degree at university;
- studying at a high status university;
- studying a particular subject;
- being employed or not by age 25;
- having higher earnings at age 25?

The data used in this analysis are described in the following section before descriptive and then regression analyses are carried out and discussed. A summary section draws the paper to a close with a discussion of the results and the implications they may have for policy and future research.

## Data and methods

We use Next Steps (formerly the Longitudinal Study of Young People in England) which follows a cohort of young people born in 1989/1990, and is made up of eight waves of data. This cohort of young people can be linked with the National Pupil Database (NPD) which provides attainment data for the census of pupils attending schools in England. Next Steps began in 2004 when the sample members were aged between 13 and 14 (UCL 2018). Respondents were selected to be representative of young people in England using a stratified random sample, with disproportionate sampling for deprived schools. Schools were the primary sampling units, then children within schools. The two-stage sampling design that Next Steps uses presents a possible clustering effect due to between-school differences; therefore, all models are adjusted for school clusters and the appropriate weights are used.

Following the approach taken by Strand (2011) and Hansen and Henderson (2019), we create a composite measure for academic self-concept using information collected at age 14 using seven variables. This includes young people's reports on whether they get good marks for their work; how good they think they are at school work; how good the

students think their teachers think they are at school work; and how good they think they are at English, maths, science and ICT.<sup>4</sup> Using a principal component analysis (PCA), we reduce these responses into a component which has underlying similarities. The results from the data rotation identified one composite factor with an Eigenvalue of one or more (2.85), where a low principal component score denotes low academic self-concept and a high score denotes high academic self-concept. To ease interpretation, the PCA-reduced variable is then used in the analysis after it is grouped into quintiles, allowing us to make comparisons between students depending on in what part of the distribution their ASC places them.

Our main outcomes of interest relate to post-compulsory educational trajectories and labour market outcomes, starting with participation in Advanced (A) Level study, participation in further education and higher education, and ending with labour market outcomes at age 25.<sup>5</sup> A levels, which are two-year courses and usually assessed by examination, are considered the traditional university-track course of study post-16.<sup>6</sup> Further Education institutions are important institutions for adult education and enable students to continue studying outside of the school environment. FE institutions offer A levels alongside a range of level 2+ diplomas and vocational training. In our analysis those studying for A levels at FE institutions (there are 449 of them) appear in the A level group. This means that the analysis of FE focuses on those taking the level 2+ diplomas and vocational training.

Higher education is at the top of the hierarchy of the educational system in the UK. It is associated with much greater labour market returns and opportunities than any prior level of education. The HE market in the UK is highly stratified, with the Russell Group universities (a network of 24 research-intensive institutions) commanding elite status and associated with increased labour market rewards (Chevalier & Conlon, 2003). Stratification within HE institutions also occurs at the level of subject studied, since there are different economic returns to studying different subjects (Belfield et al., 2018; Bratti, Naylor, & Smith, 1990; Chevalier, 2011; De Vries, 2014). To investigate labour market outcomes, we use the newest wave of Next Steps measured at age 25, which follows up sample members as they move into the labour market with a particular focus on employment and income.<sup>7</sup> We identify whether these young adults are in employment at age 25 and also look at labour income at age 25, using a derived variable capturing weekly net income at age 25.

We make use of the first four sweeps of Next Steps to capture the main independent variables which include: social class<sup>8</sup>; parental education; equivalised permanent income<sup>9</sup>; housing tenure; ethnicity; gender; special educational needs (SEN); Key Stage 2 results<sup>10</sup>; capped linear GCSE scores (Key Stage 4); and school type attended. By controlling for prior attainment and these other background characteristics we are better able to isolate the association between academic self-concept and the outcomes. Observations are included in the analytic models when the dependent variable responses have no missing data. However, some independent variables also suffer from item non-response, so in order to avoid dropping cases with missing or unknown information on background variables, we take the first available response mentioned for parental class, parental education and household tenure over the first four waves. The main advantages of this approach are avoiding the loss of statistical power due to reduced N and reducing bias.<sup>11</sup>



We restrict the sample to only those students who respond to all seven of the measures related to ASC (outlined earlier); students for whom we have GCSE results; and those who responded to details about their study status at age 19. These exclusions result in an analytical sample of 9575.

## Descriptive statistics

The post-compulsory trajectories we consider in this paper follow students through age 18 qualifications, onto higher education, and into the labour market. Of our sample, over half (54.6%) studied A levels, while just over one-tenth (11%) attended a further education institution. Nearly 40% (37.6%) of the sample went to university and of that group, one-fifth (21.1%) attended a Russell Group university. Of the entire sample, around 20% are not employed at age 25 and of those in employment the mean weekly net income is £306.59.<sup>12</sup>

However, what we are really interested in is whether these different educational pathways appear to be associated with different levels of academic self-concept. In [Table 1](#), we examine the different trajectories shown earlier by different quintiles of ASC. The results show that students with the highest levels of ASC (those in the top 20% of the distribution or the highest quintile) are more likely to be studying for A levels and less likely to be studying at an FE institution than students with the lowest levels of ASC. They are more likely to go to university and when they do, they are much more likely to attend a Russell Group university. Students with the highest levels of ASC are also more likely to study the more prestigious STEM (science, technology, engineering and maths) and high paying LEM (law, economics and management) subjects than students with the lowest ASC. Additionally, those at the top of the ASC distribution are less likely to be not working at age 25 than those at the bottom of the distribution and their pay is, on average higher than other students.

**Table 1.** Descriptive statistics by academic self-concept (ASC) quintile.

	ASC Q1 (Lowest)	ASC Q2	ASC Q3	ASC Q4	ASC Q5 (Highest)
<b>Percentage in each group:</b>					
Studying A levels	10.21	14.09	25.96	22.42	27.33
In Further Education	27.27	18.18	22.03	16.18	16.33
Attending university	9.67	13.09	25.3	22.24	29.69
Attending a Russell Group university	3.85	8.62	20.73	23.67	43.12
Studying STEM subjects (science, technology, engineering and maths (inc. medicine))	7.77	11.46	24.47	21.17	35.15
Studying LEM subject (law, economics and management subjects)	10.24	12.42	25.27	23.53	28.54
Studying other social science, arts and humanities subjects	11.11	14.78	26	23.3	24.81
Studying other subjects	15.15	19.7	28.79	15.15	21.21
Not employed at 25	23.32	19.76	16.6	21.74	18.58
<b>Income (£)</b>					
Mean weekly income at age 25	299.05	307.09	316.28	307.85	314.37

Source: University College London, UCL Institute of Education, Centre for Longitudinal Studies (2018).



## Regression results

The descriptive statistics suggest differences in post-compulsory educational participation and progression may exist according to students' academic self-concept. However, a large part of these differences is likely due to differences in students' background characteristics and prior ability. To test this more formally we run a series of regression models where we examine each of our outcomes while controlling for family background, prior attainment, school and individual characteristics that Hansen and Henderson (2019) show to be related to ASC. In this way, while controlling for other factors that may influence educational trajectories including prior attainment, our models are isolating the role academic self-concept plays in participation and progression at each level of post-compulsory education.

Our models account for the fact that individuals attending the same school are not truly independent by calculating robust standard errors clustered at school-level to conduct appropriate statistical inference. We acknowledge that while we try to minimise any possibility of omitted variable bias through use of the rich background control variables (including prior attainment measures) available in Next Steps this may remain a concern. And we interpret our results as capturing conditional relationships between ASC and educational transitions, to help us better understand the mechanisms at work rather than viewing our results as truly causal.

In Table 2 we show the results of a series of logistic regressions which examine the likelihood of studying A levels (model 1); FE participation (non A level) (model 2); university participation (model 3) and finally participation in a Russell Group university (model 4). All of these models control for demographic and family background factors, in addition to prior attainment. The results show a positive association between ASC and A level participation, indicating that even after controlling for other factors, including GCSE attainment, those with higher ASC have higher odds of studying A levels. For those with the highest levels of ASC (quintiles 4 and 5) we also see higher odds of going to university compared to those with the lowest levels of ASC.

Conversely, in model 2 we see no relationship between ASC and FE participation, the vocational post-16 route. These findings are important as they indicate that ASC, above and beyond prior attainment and structural background factors that account for achievement gaps, plays a role in whether students take the more advantageous A level route, but not in decisions to take FE routes that offer more limited trajectories. This perhaps indicates that taking, what is generally perceived as, the less favourable FE route may be more related to prior ability.

Turning now to the higher education outcomes, we find that for those with the highest ASC (quintiles 4 and 5) the odds of attending university, controlling for background factors including prior ability, are higher than for similar students with lower ASC. But when we examine the odds of attending an elite Russell Group university, for those who attend university, we find no difference across the different quintiles of ASC. This indicates that for those with the highest levels of ASC, their self-confidence increases their chances of going to university, but is not associated with their likelihood of attending an elite institution.

**Table 2.** Odds-ratios from logistic regressions predicting educational transitions.

	Model 1	Model 2	Model 3	Model 4
	A level participation	Further Education Participation	Higher Education Participation #	Russell Group
<b>Academic Self-Concept (Baseline Q1)</b>				
Q2	1.48** (0.18)	0.90 (0.12)	1.09 (0.14)	1.21 (0.37)
Q3	1.81*** (0.21)	0.90 (0.12)	1.20 (0.14)	1.07 (0.30)
Q4	2.07*** (0.26)	0.84 (0.12)	1.25+ (0.15)	1.45 (0.41)
Q5	2.15*** (0.29)	0.98 (0.14)	1.45*** (0.18)	1.51 (0.41)
<b>GCSE attainment (standardised z-scores)</b>				
	3.44*** (0.14)	0.68*** (0.03)	2.06*** (0.07)	3.40*** (0.29)
<b>Parental occupation (Ref: Higher Managerial)</b>				
Intermediate	1.02 (0.12)	1.08 (0.15)	0.92 (0.10)	0.92 (0.13)
Routine	0.94 (0.12)	1.13 (0.16)	0.89 (0.10)	0.86 (0.13)
<b>Parental qualification (Ref: Degree or equivalent)</b>				
Other HE qualification	0.85 (0.12)	1.31+ (0.21)	0.96 (0.12)	0.57*** (0.10)
A Level	0.60** (0.09)	1.36+ (0.24)	0.74* (0.10)	0.54** (0.11)
GCSE A–C	0.54*** (0.07)	1.23 (0.18)	0.66*** (0.07)	0.43*** (0.07)
Level 1 and below	0.54*** (0.08)	0.86 (0.15)	0.64** (0.09)	0.62* (0.13)
<b>Family income 13–17 (multiple of £10,000)</b>				
	1.14* (0.06)	0.98 (0.06)	1.17*** (0.05)	1.07 (0.06)
<b>Housing tenure (Ref: Owns/Mortgage)</b>				
Rent/ Other	0.87 (0.09)	0.88 (0.10)	0.70*** (0.07)	0.69+ (0.14)
<b>Ethnicity (Ref: White)</b>				
Mixed	1.25 (0.24)	1.21 (0.25)	0.92 (0.17)	1.85* (0.50)
Indian	3.95*** (0.69)	0.87 (0.17)	5.17*** (0.82)	1.09 (0.22)
Pakistani	2.81*** (.050)	1.54* (0.28)	3.45*** (0.59)	1.03 (0.30)
Bangladeshi	3.73*** (0.78)	1.17 (0.28)	3.83*** (0.74)	0.83 (0.28)
Black Caribbean	1.62* (0.38)	1.15 (0.30)	2.62*** (0.60)	0.78 (0.39)
Black African	3.44*** (0.88)	0.65 (0.22)	4.19*** (0.97)	0.98 (0.37)
Other	2.90*** (0.70)	1.02 (0.27)	2.24*** (0.44)	0.73 (0.22)
<b>Sex (Ref: Male)</b>				
Female	1.26** (0.10)	0.86 (0.07)	1.11 (0.08)	0.89 (0.10)
<b>Special Education Needs (Ref: No SEN)</b>				
Special Education Needs	0.69* (0.13)	0.89 (0.15)	1.14 (0.22)	1.22 (0.43)
<b>Independent school (Ref: Did not attend Independent School)</b>				
Independent School	2.38+ (1.06)	0.64 (0.30)	1.06 (0.30)	1.12 (0.34)

*(Continued)*

**Table 2.** (Continued).

	Model 1	Model 2	Model 3	Model 4
	A level participation	Further Education Participation	Higher Education Participation #	Russell Group
<b>A levels (Ref: Did not take A levels)</b>				
A levels			3.49*** (0.31)	0.96 (0.26)
Constant	0.03*** (0.01)	0.40*** (0.09)	0.03*** (0.01)	0.00*** (0.00)
Pseudo R-squared	0.43	0.02	0.34	0.25
Observations	9575	9575	9575	3588

Notes: Standard errors in parentheses. Sign: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.10$ ; # With A-level participation; The pseudo R-squared is calculated from the unweighted model.

Source: University College London, UCL Institute of Education, Centre for Longitudinal Studies (2018).

Previous research has indicated that within the HE system certain subjects are more prestigious than others (STEM) and some are associated with higher paying jobs (LEM) (Belfield et al., 2018; De Vries, 2014; Macmillan et al., 2014; Walker & Zhu, 2011). To test whether ASC is related to differences in subject choice at HE we run a multinomial logit regression to examine the impact ASC has on the odds of studying different subject groups at university. These results are shown in Table 3. In this analysis the base category is STEM subjects so the coefficients on the different subject groupings tell us the odds of studying those subjects compared to studying for a degree in science, technology, engineering and maths subjects (including medicine). The findings suggest that ASC does not predict subject studied at university. Apart from those in the highest ASC quintile being less likely to study other social sciences, arts and history (OSSAH) than STEM subjects, there is no difference across the ASC quintiles in the subjects studied at university. In fact, few of the independent variables in the model show a relationship with subject choice at university, with the exception of those with higher GCSE scores, who are less likely to study LEM (law, economics and management), other social sciences, arts and history (OSSAH) or any other subjects than to study STEM subjects; and students from Indian, Pakistani and Bangladeshi ethnicities, who are less likely to study OSSAH subjects than STEM subjects.

The results suggest that ASC is associated with differences in some of the post-educational routes but not with all. ASC is associated with an increased likelihood of studying for A levels and, for those with the highest ASC, more ASC increases the likelihood of going to university. However, there is no evidence that ASC is associated with going to an elite Russell Group university or related to differences in subjects studied at university.

In the final part of the analysis we examine whether, controlling for these different trajectories, ASC is associated with labour market outcomes in early adulthood. To this end, Table 4 shows the results of two models: the first is a logit model examining the probability of not being in employment at age 25 (model 1) and the second is an OLS regression of ASC on income at age 25 (model 2). We would expect that ASC would be positively related to both of these outcomes, such that young people with higher ASC

**Table 3.** Odds-ratios from multinomial logit regression predicting subject studied at university: compared to studying STEM (science, technology, engineering or maths) subjects.

Baseline STEM	Law, Economics, Management	Other Social Sciences, Arts and Humanities	Other
<b>Academic Self-Concept (Reference Q1)</b>			
Q2	1.04 (0.27)	1.07 (0.22)	1.09 (0.51)
Q3	1.21 (0.28)	0.93 (0.17)	1.07 (0.48)
Q4	1.25 (0.30)	1.01 (0.19)	0.65 (0.32)
Q5	1.09 (0.26)	0.69+ (0.13)	0.68 (0.33)
<b>GCSE attainment (standardised z-scores)</b>	0.68*** (0.04)	0.79*** (0.04)	0.52*** (0.07)
<b>Parental Occupation (Ref: Higher Managerial)</b>			
Intermediate	0.69* (0.12)	0.94 (0.12)	0.61 (0.23)
Routine	0.92 (0.16)	1.01 (0.14)	0.70 (0.27)
<b>Parental Education (Ref: Degree or equivalent)</b>			
Other HE qualification	1.22 (0.24)	0.84 (0.12)	0.88 (0.39)
A Level	1.22 (0.28)	0.95 (0.16)	0.83 (0.45)
GCSE A–C	1.41+ (0.26)	0.77+ (0.11)	1.28 (0.55)
Level 1 and below	1.10 (0.24)	0.86 (0.16)	0.92 (0.48)
<b>Family income 13–17 (multiple of £10,000)</b>			
	1.08 (0.07)	1.00 (0.05)	0.89 (0.14)
<b>Housing tenure (Ref: Owns/Mortgage)</b>			
Rent/ Other	0.98 (0.18)	1.17 (0.18)	0.96 (0.39)
<b>Ethnicity (Ref: White)</b>			
Mixed	0.76 (0.27)	0.77 (0.19)	0.68 (0.52)
Indian	1.43+ (0.27)	0.44*** (0.08)	0.58 (0.28)
Pakistani	1.56+ (0.36)	0.28*** (0.07)	0.43 (0.28)
Bangladeshi	2.01* (0.55)	0.43** (0.12)	0.73 (0.52)
Black Caribbean	1.80 (0.67)	0.89 (0.29)	0.00 (0.00)
Black African	2.16* (0.75)	1.02 (0.32)	2.18 (1.29)
Other	1.45 (0.39)	0.39*** (0.10)	1.16 (0.67)
<b>Sex (Ref: Male)</b>			
Female	1.60*** (0.20)	1.89*** (0.19)	1.09 (0.29)
<b>Special Education Needs (Ref: No SEN)</b>			
Special Education Needs	0.93 (0.37)	0.82 (0.25)	0.78 (0.62)
<b>Independent School (Ref: Did not attend Independent School)</b>			
Independent School	1.08 (0.44)	0.87 (0.26)	3.62* (2.19)

*(Continued)*

**Table 3.** (Continued).

Baseline STEM	Law, Economics, Management	Other Social Sciences, Arts and Humanities	Other
<b>A levels (Ref: Did not take A Levels)</b>			
A Levels	1.52* (0.32)	1.23 (0.21)	0.89 (0.33)
Constant	0.66 (0.25)	2.12* (0.64)	1.48 (1.08)
Pseudo R-squared	0.04		
Observations	3588		

Notes: Standard errors in parentheses. Sign: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.10$ ; The pseudo R-squared is calculated from the unweighted model.

Source: University College London, UCL Institute of Education, Centre for Longitudinal Studies (2018)

would be more likely to be in employment at age 25 than similar young people with less ASC and that they would also be earning more. However, we have already seen that teenage ASC is not significantly related to going to an elite university or to subject studied at university, both of which we know are related to employability and income (Bratti et al., 1990; Chevalier, 2011; Chevalier & Conlon, 2003; De Vries, 2014). As such, it may be the case that after controlling for prior ability and other background factors there will be no association between ASC and these later labour market outcomes. When we examine the results in Table 4, this is exactly what we find. Academic self-concept is not related to either of these labour market outcomes once we include background variables including prior education and institution type.

**Table 4.** Regressions predicting employment status and weekly income at age 25.

	Probability of not being employed at age 25	Weekly income at age 25
	OR	$\beta$
<b>Academic Self-Concept (Ref Q1)</b>		
Q2	1.21 (0.25)	2.90 (1.98)
Q3	0.85 (0.18)	0.22 (1.88)
Q4	1.38 (0.29)	-1.30 (1.99)
Q5	1.27 (0.28)	-1.93 (2.05)
Constant	0.07 (0.02)	293.49*** (2.77)
Observations	4531	4531

Notes: Controls for: Prior attainment; parental class; parental education; family income 13–17; household tenure; ethnicity; gender; Special Education Needs; Independent School; A Levels; attended university; attended college. Standard errors in parentheses. Sign: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.10$ .

Source: University College London, UCL Institute of Education, Centre for Longitudinal Studies (2018).

## Discussion

This paper uses data from a recent English cohort, Next Steps, to examine the role ASC plays in influencing post-compulsory educational trajectories. These data are observational in nature, and by necessity of the subject we are studying, we need to observe students with different levels of ASC and see how these differences are related to later outcomes. As such, we do not view our results as causal, but rather as capturing conditional relationships between ASC and later educational and labour market achievements in a large nationally representative dataset, which has high external validity. The results show a positive and significant association between ASC and A level participation and, for those with the highest ASC, increased odds in going to university, net of prior attainment and background characteristics. This perhaps suggests that ASC has the potential to play an important role in promoting a pathway to university. In terms of magnitude the odds between the ASC quintiles is larger than the structural factors that were also found to influence the likelihood of studying A levels or going to university, such as parental education and family income. However, we could find no evidence that ASC is associated with attending an elite Russell Group university or with studying more prestigious or high earning subjects over and above background characteristics and prior attainment.

It is possible that our analysis fails to capture associations between ASC and these later labour market outcomes because our measure of ASC, recorded at age 15, is too static a measure of ASC to expect to see associations with these later outcomes. The reciprocal relationship between ASC and achievement may mean that while our measure of ASC is good at predicting outcomes at 18 (A level and university participation) experiences and achievement between the age of 15 and 25 mean our ASC measure is less good at predicting labour market outcomes at age 25. However, it is important to acknowledge that despite the fact that the results here suggest that ASC does not directly influence employment or income at age 25 net of prior attainment, education and social background characteristics, there will be an indirect relationship as ASC influences A levels and the likelihood of going to university, both of which are associated with improved labour market outcomes (Chevalier & Conlon, 2003; Conlon & Patrignani, 2015).

Although not causal, these findings would seem to suggest that if policy makers and teachers were to focus on increasing the ASC of pupils, this might improve students' educational trajectories, increasing the likelihood that students will study A levels and, for some, increasing the likelihood of attending university. Both are pivotal educational cross-roads, so influencing routes at these points not only has the potential to improve opportunities for individuals, but also widen access to HE among groups with traditionally lower participation rates, thereby improving later outcomes, indirectly. Our work would support the introduction of interventions aimed at raising ASC and the subsequent analysis of the experimental data this would generate to consolidate on the research in this paper and perhaps allow us to elaborate on the findings in terms of causal relationships.

## Notes

1. Since 2015, it has been a legal requirement for everyone to stay in education until the age of 18.
2. Although some follow more vocational and applied level 3 qualifications (Hupkau et al., 2016).
3. Although some of these effects are ameliorated by prior attainment (Chowdry et al., 2010).
4. The specific question wording is as follows: 'How good do you think you are at school work?; How do you think your teachers would describe your school work?; I get good marks for my work; And thinking about some subjects at school, how good would you say you are at English/Maths/Science/ICT?'
5. Age 25 information is the latest available for employment and income data.
6. Although A levels are the most widely held qualification among 18-year-olds accepted to university from the UK, there are other routes to university. A minority of 18-year-olds in 2016 were also accepted holding BTECs and a combination of A levels and BTECs (UCAS, 2016).
7. The data captures income rather than wages: income is the overall money a person gets, which may include benefits, pay, income from other jobs, and income from other sources (such as rent), while wages just refers to pay from work.
8. Social class is measured using the National Statistics Socio Economic Classification (NS-SEC) which uses occupational types to capture dimensions of social class (Rose & Pevalin, 2001). We make use of the three-category NS-SEC, which consists of: Higher Managerial, administrative and professional occupations; Intermediate occupations; Routine and manual occupations. More details can be found at <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/soc2010-volume-3-ns-sec-rebased-on-soc2010-user-manual/index.html#5>.
9. We take an average of the household income over the first four waves and divide by the square root of household size to provide a measure of equivalised permanent income. This has been shown to have a larger effect on young people's educational outcomes than transitory income (Jenkins & Schluter, 2002).
10. This measure of attainment is used in the model predicting academic self-concept only (Table 2), as Key Stage 2 results are prior to the measure of academic self-concept. Where we model subsequent outcomes, we make use of the more contemporaneous measure, GCSE results. Key Stage 2 tests are taken in schools on the scheduled days when the young person is aged 11. These are part of the National Assessment which is an essential aspect of the National Curriculum programme. The tests at Key Stage 2 are part of the requirement for schools to report school-level results and to enable the government to publish league tables.
11. Multiple imputation approaches are not compatible with running a principal component analysis, therefore we take a completed case approach.
12. While we take a completed case approach to our analyses with applied non-response weights, there remains a possibility that in any sub-group analysis, where we look specifically at those who participated in higher education for example, our sample may not be representative of all those in HE. Where we look at income and employment status our sample is restricted to cases for which we have this information at age 25. This may mean the sample is not fully representative of all in the labour market at age 25. To reassure the reader we can compare our profile of our sample with external sources we believe to be representative of the whole populations we are interested in. For example, the percentage of students attending university in our sample (38%) is close to the 36% of all young people attending university reported by the BBC using OECD figures from 2008 when our cohort would have been the right age to attend university (Coughlan, 2010). Likewise, within our sample we have 20% of 25-year-olds not in employment, which compares well to 19% of 25–34 year olds reported, by the ONS using data from the Labour Force Survey, as not being in employment in 2015 when our cohort members were 25 (ONS, 2021).



## Acknowledgements

The support of the Economic and Social Research Council, the Office for Students and Research England (grant reference ES/M010082/1) is gratefully acknowledged along with support from the ESRC/OFSRE Centre for Global Higher Education (CGHE), UCL Institute of Education, London.

We would like to thank the Editor and two reviewers for useful comments and suggestions on a previous version of this paper.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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