



CAMBRIDGE ASSESSMENT

Examining the impact of tiered examinations on the aspirations of young people

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Abstract

Tiered examinations are commonly employed within GCSE examinations in the UK. They are intended to ensure that the difficulties of exam papers are correctly tailored to the ability of the candidates taking them; this should ensure more accurate measurements and also a better experience for candidates as they do not spend time addressing questions that are either too easy or too difficult given their level of skill. However tiered examinations have also been criticised for potentially damaging the aspirations of young people entered for lower tier examinations by placing a limit on the grades they can achieve. This paper explores the extent of the link between GCSE entry tier and aspirations and also investigates the extent to which this link can be explained by differences in achievement and background characteristics of pupils.

The research makes use of data available from the Longitudinal Study of Young People in England (LSYPE) linked to information available from the National Pupil Database (NPD) regarding the qualifications achieved by pupils and also their entry tier at GCSE. A variety of statistical methods, including multilevel modelling and propensity score matching, were used to evaluate the association between entry tier and the length of time pupils intend to stay in education whilst taking account of the impact of various background characteristics as well as the educational aspirations of young people prior to beginning their GCSEs.

The analysis shows that there is a strong link between GCSE entry tier and educational aspirations. However, this link is largely explained by the actual achievement of young people at GCSE. That is, the relationship between aspirations and entering a lower tier at GCSE is largely attributable to the relationship between achievement and entering a lower tier at GCSE. Furthermore, even if achievement at key stage 4 itself is not accounted for, much of the association between entry tier and aspirations can be explained by the background characteristics of young people or their prior aspirations.

Introduction

The aim of this research is to explore the extent of the link between the tier for which young people are entered for particular GCSEs and their future educational aspirations. As such, the analysis presented here is intended to address the question of the extent to which tiering places a cap on the aspirations of young people entered for the lower tier.

The research makes use of data available from the Longitudinal Study of Young People in England¹ (LSYPE). The LSYPE began in 2004 collecting data on the attitudes of around 16,000 year 9 pupils in a representative sample of English schools. These pupils have been followed up in every subsequent year so that data has been collected on their educational and attitudinal development over time. Of particular focus for this paper is data regarding the entry tier of these young people in their GCSEs; the majority of which were taken in summer 2006 and are recorded in the National Pupil Database. By linking this data to questionnaire responses about young people's future educational aspirations we can explore the relationships between GCSE entry tiers and aspirations.

It should be noted that this paper does not explore the effects of tiered assessment on the achievement of young people but is purely concerned with the effect on aspirations. Furthermore, this paper only examines the possible effects of tiering during key stage 4. Any effects of tiering on pupils prior to the beginning of key stage 4 are beyond the scope of this research.

Method

Data on the entries and achievements at Key Stage 4 of the young people participating in the LSYPE is available from the National Pupil Database (NPD). For every qualification taken by young people during key stage 4 a number of details including qualification type, subject and achieved grade are recorded. Also recorded is a qualification identifier provided by the exam board delivering the qualification. For GCSEs delivered by AQA (and occasionally OCR²) the qualification identifier is suffixed by the letters "F", "I" or "H" to indicate whether the candidate took the qualification at the foundation, intermediate or higher tier respectively. Using this information, for a subsample of young people, it was possible to identify the tier at which they were entered for their Maths and English GCSEs.

Data on the educational aspirations of these young people is available from a questionnaire completed during 2006 by around 12,000 of the LSYPE participants at the end of year 11. This questionnaire asked specific questions about whether young people intended to stay in education post-16 and also about how likely it was that they would apply to university in the future. The aim of analysis was to explore the relationship between young people's responses to these questions and their GCSE entry tiers in Maths and English.

In undertaking such an analysis it is immediately clear that any link between tier and educational aspirations could be explained by a number of pre-existing external factors. For example, it may be that pupils who enter lower tiers at GCSE are those that had low aspirations to begin with and so would be likely to continue to be those with low aspirations even if GCSE tier itself had no negative effect. Alternatively, it is extremely likely that pupils

¹ For further detail on this study please visit <https://www.education.gov.uk/lsype/workspaces/public/wiki/Welcome/LSYPE>

² But never Edexcel or WJEC.

entering lower tiers at GCSE will be those with lower levels of ability on average and thus would tend to have lower aspirations regardless of their entry tier. For these reasons it was important for the analysis to take account of these factors and others in order to make valid conclusions about the relationship between entry tier and aspirations. The analysis accounted for the following potentially influential factors:

- Educational ability
- Gender
- Eligibility for free school meals
- Level of special educational needs
- Ethnicity
- Language spoken at home
- Initial intentions regarding post-16 education as measured in year 9³
- Feelings in year 9 about likelihood of applying for and being accepted into university in future
- Attitude to school work as measured in year 9 using a composite score derived from 12 survey questions⁴
- Number of risk factors experienced by students⁵ in year 9

Analysis comparing the aspirations of pupils in each tier was undertaken using a combination of propensity score matching and multilevel modelling. Very brief details of this process are as follows. Initially pupils were divided into two groups based upon their entry tier. Pupils whose entry tier was not identified were removed from analysis. Within each group, pupils with background characteristics unlikely to be found in the opposing group were removed from analysis. For example, because very high attaining students were unlikely to be entered for lower tier exams, all such pupils were removed from the data set. At this point an initial comparison between the aspirations of the young people in each tier was made. Responses from the group of students in the higher of the two tiers being compared were weighted according to the background characteristic of students. This was done such that (after weights were applied) the background characteristics of pupils in the higher tier matched the background characteristics of those in the lower tier. Comparing aspirations between lower tier pupils and the resulting weighted data for higher tier pupils provided an estimate of the differences between the two groups whilst accounting for the effect of other influential factors. The statistical significance of differences was then verified using multilevel modelling.

For the purposes of analysis, educational ability was measured in each of two ways; either using key stage 3 attainment⁶ or key stage 4 attainment⁷. In the latter case, because GCSE entry tiers restrict the grades available to students, this placed a restriction on the data that could be meaningfully included in analysis. For English GCSE, aspirations of foundation and higher tier pupils could only be meaningfully compared for those achieving C or D in GCSE

³ That is, prior to beginning study for GCSEs

⁴ See page 381 of http://www.esds.ac.uk/doc/5545/mrdoc/pdf/5545wave_one_documentation.pdf for further details.

⁵ Risk factors include involvement in activities such as smoking, alcohol or drug abuse, vandalism, truancy and others.

⁶ As measured by fine graded point scores in each subject

⁷ Measured by the grade achieved in the subject of interest as well as the “capped total points score” which provided a more general measure of pupils’ attainment across all their key stage 4 subjects.

English. For mathematics GCSE, foundation and intermediate tier pupils could only be meaningfully compared for those achieving D or E, whereas intermediate and higher tier pupils could only be compared for those achieving B or C. No such explicit restrictions were placed on the analyses which used key stage 3 attainment to account for differences in the educational ability of students within different tiers⁸.

As noted earlier, entry tier was only identifiable for candidates taking their GCSEs with particular exam boards. For English GCSE, because AQA is the major provider of this qualification, all relevant data could be identified for a sample of over 7,000 pupils. However, for Maths GCSE, because a greater proportion of candidates take the subject with Edexcel, a sample of less than 3,000 pupils was available for analysis. Furthermore the data for mathematics GCSE was split across three tiers rather than two. For this reason estimates of the relationship between Maths entry tier and aspirations are subject to greater uncertainty than similar estimates based on entry tier in English⁹.

⁸ Although, due to the very strong association between key stage 3 attainment and entry tier, a number of pupils with achievement levels that were not comparable across tiers were removed from analysis.

⁹ Another impact of the smaller sample size for analysis of Maths GCSE was that, for analysis taking account of key stage 3 attainment, it was not possible to adequately match higher and lower tier candidates across all of the listed background characteristics. For this reason it was necessary to restrict analysis to take account of only: key stage 3 attainment, gender, prior intentions regarding post-16 education and prior attitudes to university.

Results

Results of analysis comparing pupils entered for different tiers whilst controlling for attainment at key stage 3 and other background factors are shown in table 1. The first two columns of data show, for the young people in each tier retained within the analysis, the percentage saying that they intend to stay in education post-16 and the percentage saying they are likely to apply to university in future. The third column then shows the adjusted figure for higher tier candidates after weighting the data to account for the background characteristics of these young people. For example, the first row of data shows that 82 per cent of candidates entering foundation tier English intended to stay in education post-16 compared to 95 per cent of higher tier candidates. However, weighting the data to account for background characteristics reduces the figure for higher tier candidates to 87 per cent. In other words, this means that we estimate that a group of candidates with background characteristics equivalent to those who entered the lower tier, but who actually entered the higher tier would have an 87 per cent chance of saying they intend to stay in education post-16. The final two columns of data present the number of pupils available for analysis within each comparison. A graphical presentation of the same analysis is shown in figure 1.

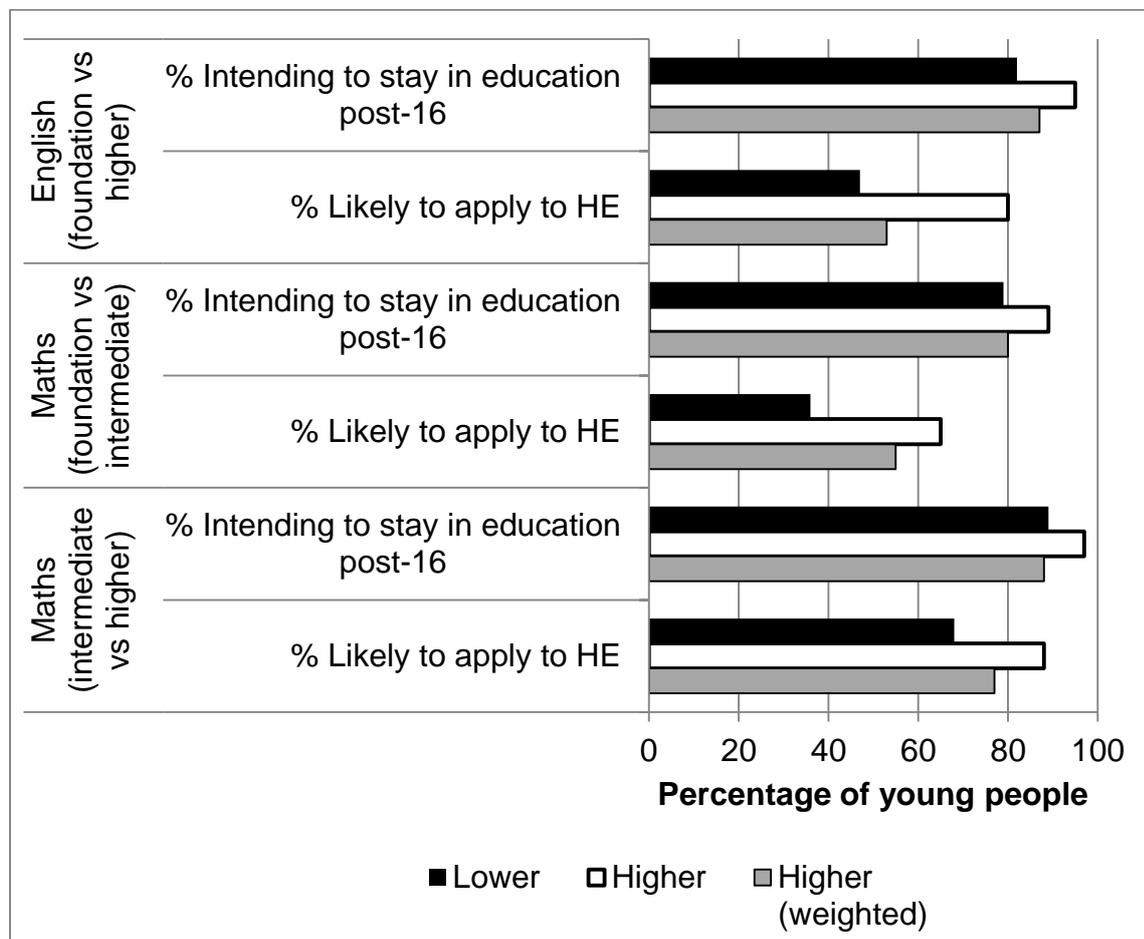
These results show that although there is a strong relationship between GCSE entry tier and educational aspirations, much of this link is explained by the background characteristics of young people. In particular, once the impact of background characteristics has been accounted for, there appears very little difference between young people entered for lower and higher tiers in terms of their intentions to remain in education post-16. Having said this, the difference between tiers for English GCSE remains statistically significant (albeit small). Furthermore, there are statistically significant differences between tiers in terms of aspirations regarding higher education for both English GCSE and for Maths GCSE when comparing those in the foundation tier to those in the intermediate tier¹⁰.

¹⁰ Despite the apparently large size of the difference in aspirations regarding higher education between intermediate and higher tier Maths students, the relatively small sample size available for this analysis means that this difference is not found to be statistically significant.

Table 1: Differences in aspirations between candidates entering different tiers before and after accounting for differences in key stage 3 attainment and other background characteristics

GCSE subject (tiers being compared)	Outcome	Lower tier	Higher tier	Higher tier (weighted)	N (lower tier)	N (higher tier)
English (foundation vs higher)	% Intending to stay in education post-16	82	95	87	2920	4222
	% Likely to apply to HE	47	80	53	3041	4273
Maths (foundation vs intermediate)	% Intending to stay in education post-16	79	89	80	558	1553
	% Likely to apply to HE	36	65	55	582	1591
Maths (intermediate vs higher)	% Intending to stay in education post-16	89	97	88	1255	607
	% Likely to apply to HE	68	88	77	1286	613

Figure 1: Differences in aspirations between candidates entering different tiers before and after accounting for differences in key stage 3 attainment and other background characteristics



A possible criticism of the above analysis is that it does not adequately take account of the main factor likely to determine the entry tier of young people; namely their ability in the given subject at the time at which they were entered for the exam. To address this, the same analysis was repeated but taking account of achievement at key stage 4 rather than key stage 3. The results of this analysis are shown in table 2 and figure 2.

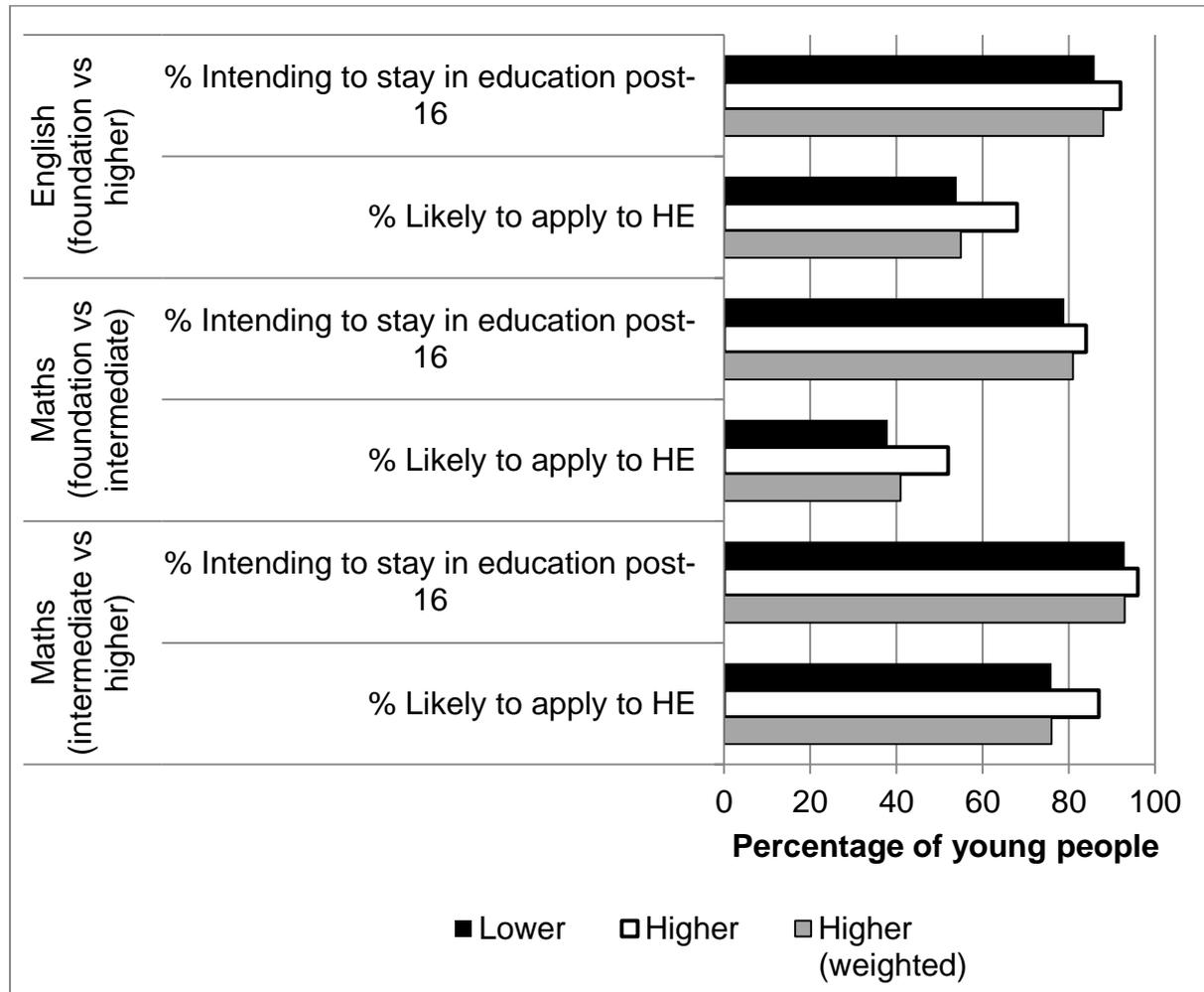
As with the previous analysis, these tables show that, before taking account of the impact of background characteristics, there are some large differences in the educational aspirations of young people. However, once the abilities and characteristics of the different students are taken into account, these differences in aspirations almost entirely vanish. Indeed, none of the differences between tiers shown in figure 2 are statistically significant once we have taken the impact of other factors into account. This implies that (all else being equal) it does not matter whether a candidate achieves a grade C (for example) in the higher tier or the lower tier; the future aspirations of the student will be identical. This would imply that students should be entered for the tier most appropriate to their ability, and there is no need for concern that such a strategy may damage their educational aspirations.

Table 2: Differences in aspirations between candidates entering different tiers before and after accounting for differences in key stage 4 attainment and other background characteristics

GCSE subject (tiers being compared)	Outcome	Lower tier	Higher tier	Higher tier (weighted)	N (lower tier)	N (higher tier)
English (foundation vs higher)	% Intending to stay in education post-16	86	92	88	2090	1722
	% Likely to apply to HE	54	68	55	2156	1754
Maths (foundation vs intermediate)	% Intending to stay in education post-16	79	84	81	402	541
	% Likely to apply to HE	38	52	41	416	569
Maths (intermediate vs higher)	% Intending to stay in education post-16	93	96	93	869	442
	% Likely to apply to HE	76	87	76	879	447

A potential criticism of this approach is that it could be argued that entry tier affects aspirations by first reducing the likely achievement of young people at GCSE. Thus, controlling for attainment within GCSE itself is inappropriate. However, our earlier analysis has shown that even if we only control for attainment at key stage 3, much of the difference between the aspirations of candidates in different tiers can be explained. For this reason we can conclude that the impact of GCSE entry tier on educational aspirations is quite small at worst and, when we allow for the possible impact of other potential explanatory variables not included within this analysis, potentially non-existent.

Figure 2: Differences in aspirations between candidates entering different tiers before and after accounting for differences in key stage 4 attainment and other background characteristics



Although examining the association between tiers and aspirations is of some value in its own right, aspirations do not necessarily translate into actual continuation in education¹¹; that is, just because a pupil intends to do something doesn't necessarily mean that they actually will. For this reason it was of interest to also examine the relationship between tiers and the actual educational destinations of pupils at the start of each of the academic years after the end of compulsory education. That is, whether they were participating in education (including apprenticeships) in October 2006 and October 2007.

The same analysis as for aspirations was undertaken this time with the outcome of interest being whether young people were participating in any form of education in October 2006 and October 2007. The results after taking account of background variables including key stage 3 attainment are shown in table 3 and figure 3. The results after taking account of key stage 4 attainment are shown in table 4 and figure 4. The findings with respect to actual destinations are in line with those described earlier with respect to aspirations. Before taking account of the background characteristics of young people there is a clear difference in the probability of those entered for different tiers remaining in education post-16. However, once the influence of background characteristics is taken into account this difference is greatly reduced. Furthermore, as shown in table 4 and figure 4, once we account for the achievement of pupils at key stage 4 there is essentially no difference between the educational destinations of those who were entered for the lower tier and those entered for the higher tier.

¹¹ Gorard, S., See, B.,H., and Davies, P. (2012). The impact of attitudes and aspirations on educational attainment and participation. Joseph Rowntree Foundation: York.

Table 3: Differences in probability of continuing in education between candidates entering different tiers before and after accounting for differences in key stage 3 attainment and other background characteristics

GCSE subject (tiers being compared)	Outcome (% within education or training in...)	Lower tier	Higher tier	Higher tier (weighted)	N (lower tier)	N (higher tier)
English (foundation vs higher)	October 2006	79	94	81	2748	4015
	October 2007	70	88	71	2502	3807
Maths (foundation vs intermediate)	October 2006	76	88	84	503	1474
	October 2007	67	79	73	468	1369
Maths (intermediate vs higher)	October 2006	88	97	93	1215	589
	October 2007	81	92	89	1118	573

Figure 3: Differences in probability of continuing in education between candidates entering different tiers before and after accounting for differences in key stage 3 attainment and other background characteristics

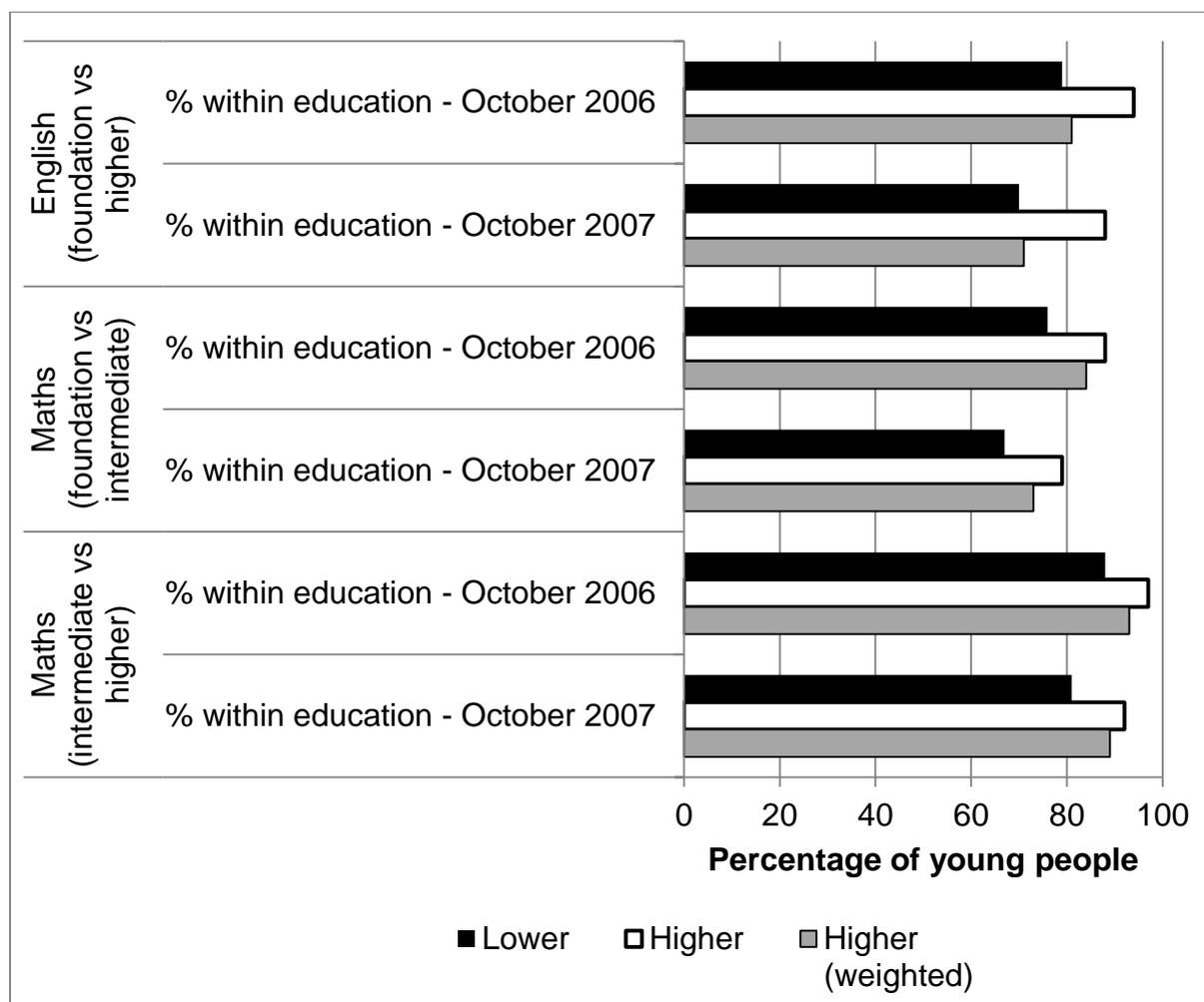
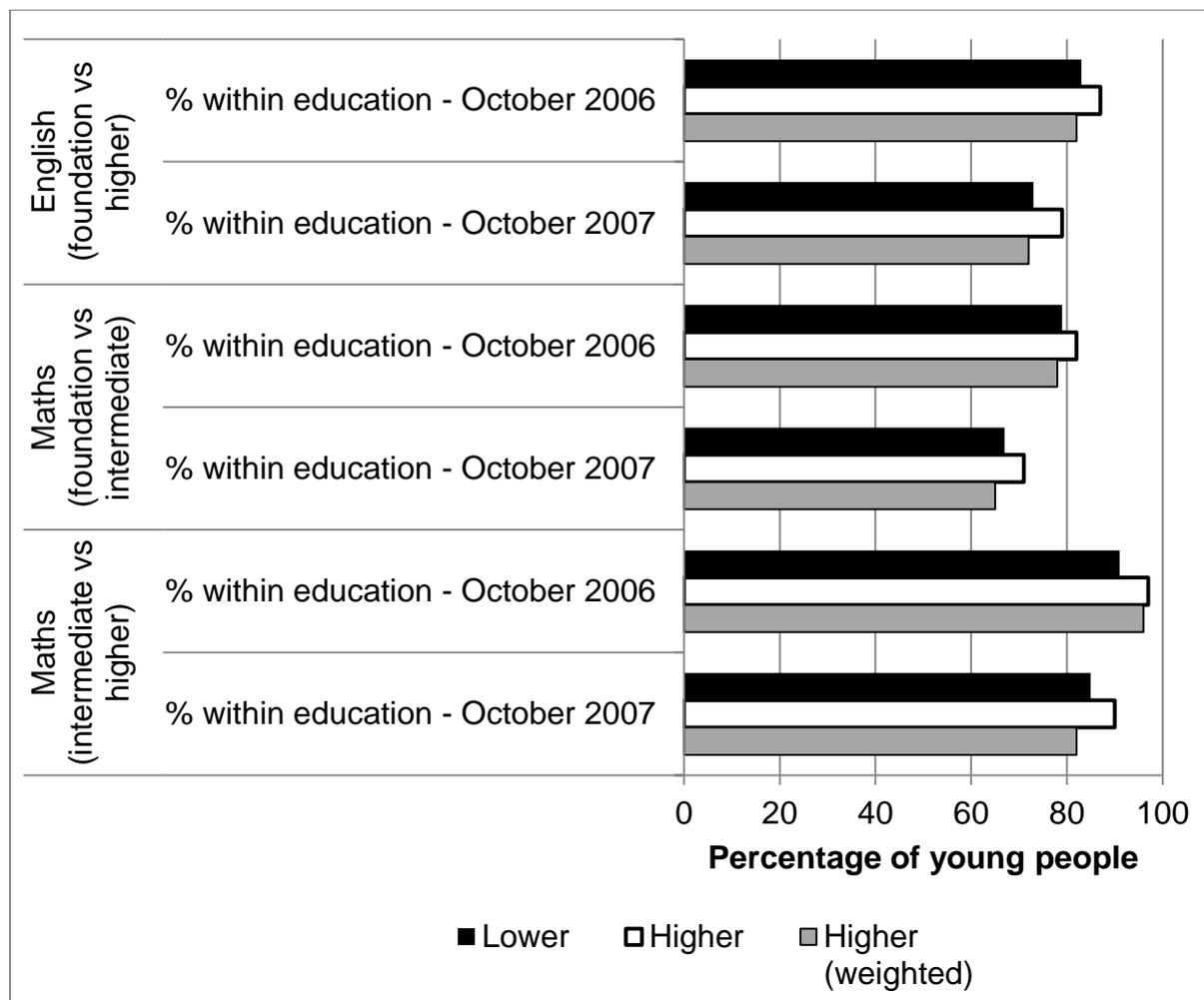


Table 4: Differences in probability of continuing in education between candidates entering different tiers before and after accounting for differences in key stage 4 attainment and other background characteristics

GCSE subject (tiers being compared)	Outcome (% within education or training in...)	Lower tier	Higher tier	Higher tier (weighted)	N (lower tier)	N (higher tier)
English (foundation vs higher)	October 2006	83	87	82	1952	1572
	October 2007	73	79	72	1809	1450
Maths (foundation vs intermediate)	October 2006	79	82	78	369	530
	October 2007	67	71	65	349	482
Maths (intermediate vs higher)	October 2006	91	97	96	835	429
	October 2007	85	90	82	781	414

Figure 4: Differences in probability of continuing in education between candidates entering different tiers before and after accounting for differences in key stage 4 attainment and other background characteristics



Summary and caveats

The analysis presented here has explored the link between entry tier in Maths and English GCSE and future educational aspirations as measured within the Longitudinal Study of Young People in England (LSYPE). The analysis shows that any differences in aspirations can be entirely explained by the background characteristics of young people and in particular their educational ability as measured by their level of achievement at key stage 4. Whilst it could be argued that taking account of achievement at key stage 4 is inappropriate (as this could itself be affected by entry tier), our analysis has also shown that even taking account of achievement at key stage 3 is sufficient to explain much of the difference in the aspirations of higher and lower tier students.

It should be noted that this analysis is based on somewhat old data; the young people being studied completed their GCSEs in 2006. Furthermore, because information about entry tier is only available from particular exam boards, analysis is largely restricted to pupils taking Maths and English with AQA rather than with any other exam boards. Thus our analysis implicitly assumes that the impact of tiering will be similar across different exam boards. Nevertheless, despite the need to restrict to candidates entering English and Maths to particular exam boards, we have successfully been able to compare the educational aspirations of several thousand higher and lower tier candidates. Once differences in the characteristics of these pupils are accounted for we have seen remarkable similarity in their educational aspirations. This provides a clear empirical challenge to the statement that being placed in a lower tier examination will adversely affect a pupil's attitude towards continuing in education.