Pathways to success

Increasing online careers advice engagement for disadvantaged young people

Research report

October 2021

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Executive summary

Background

Career guidance can raise aspirations and help young people make informed choices about their future.[1,2] However, research suggests that young people from disadvantaged backgrounds may be less likely than their peers to engage with careers provision.[3] This may be due to a host of reasons, including perceptions that some careers are 'not for them'.[4] There is evidence to suggest that young people from more disadvantaged backgrounds tend to rely on informal (or "hot") information from their social networks rather than formal (or "cold") information.[5] As a result, simply providing more information on careers may not be enough to truly expand horizons.[6]

This project aimed to increase disadvantaged young people's engagement with career advice - with the ultimate aim of improving their education and labour market outcomes. We wanted to explore behavioural interventions as we know some behaviours, like accessing careers advice and engaging with relevant content, if increased, could lead to better outcomes. To enable rapid testing of interventions, we explored engagement with online careers advice. We worked with two platforms: Unifrog[7] (which helps students in years 9-13 to learn about career options) and GetMyFirstJob[8] (which helps young people aged 14+ to find their first jobs by listing vacancies and providing career guidance).

Interventions

Based on the findings from our evidence review we designed two interventions, customised to each careers advice platform:

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[1]Chambers, N., Kashefpakdel, E. T., Rehill, J. and Percy, C. Drawing the Future: Exploring the career aspirations of primary school children from around the world, London: Education and Employers, 2018.

[2]Wright, S. Young people's decision-making in 14-19 education and training: A review of the literature. Nuffield Review of 14-19 Education and Training Briefing Paper 4. Oxford: Nuffield Review of 14-19 Education and Training, 2005.

[3] Greenbank, P., & Hepworth, S. Improving the career decision-making behaviour of working class students. Journal of European Industrial Training, 32(7), 492–509, 2008.

[4]Chambers, N., Kashefpakdel, E. T., Rehill, J. and Percy, C. Drawing the Future: Exploring the career aspirations of primary school children from around the world, London: Education and Employers, 2018.

[5]The Careers and Enterprise Company. Moments of Choice How education outcomes data can support better informed career decisions: A Research Paper, 2016.

[6] Howieson, C. and Temple, S. *The impact of careers websites: What's the evidence?* British Journal of Guidance and Counselling 41(3), pp. 287 - 301, 2013.

[7] https://www.unifrog.org/about

[8] https://www.getmyfirstjob.co.uk/OurStory/AboutUs.aspx

- **A 5-minute motivational activity** that prompted young people to reflect on the value of learning about careers and then set goals for completing activities on the career advice platform.

- **A 5-minute motivational activity + informative, belonging-oriented nudges.** The nudges prompted young people to consider more aspirational courses, jobs or careers - in terms of qualification level or earnings.

We tested these interventions against the business-as-usual website design using a randomised controlled trial in which students were randomly assigned to receive different interventions. We wanted to test interventions in an environment as close to reality as possible - pupils were shown interventions during their normal activity on the sites. The trial was run with 44,044 students aged 13 to 19 from POLAR groups 1 and 2 across both platforms between February and November 2020 (including during school closures driven by the COVID-19 pandemic). Outcome measures aimed to capture both engagement with career support (e.g. number of career-related activities completed) and aspiration (e.g. qualification level or salary), as we know that students, particularly those from disadvantaged backgrounds, may access less careers advice but may also have lower aspiration levels.

Results and discussion

Overall, we found little evidence that the interventions increased engagement or aspiration levels for our target group. On Unifrog, we found a small significant increase in career engagement, shown by an increase in the number of shortlists young people made following our intervention (11.34 shortlists made in the control group, 11.68 in the treatment group). However, we found no other significant results. Lower uptake than expected of the motivational activity (the uptake rate was 32% on Unifrog and 10% on GetMyFirstJob) and potentially low views of the other nudges, may have diluted the effects of the intervention. We designed the trial to be as close to reality as possible, so the low uptake is an important finding in itself and shows that further research on boosting uptake is needed.

We also faced a host of implementation challenges which may have affected impact. Primarily, it is possible that engagement with the intervention and with online career support in general may have been different given that most of the trial took place during the COVID-19 pandemic - with the Unifrog trial running largely during school closures.

Interestingly, through our analysis, we did find differences between gender, age and disadvantage. Male students had higher aspiration levels but lower engagement levels than female students. For example, on Unifrog, the median salary of the careers male students favourited was significantly higher than female students— a difference of £864. Older students were typically more aspirational than younger ones, and they were also more engaged on Unifrog, though less engaged on GetMyFirstJob. Students from more advantaged backgrounds were more aspirational and engaged than students from less advantaged backgrounds.

Recommendations

Careers advice providers should continue to identify and attempt to address any disparities related to disadvantage on their platform. Using lessons from this project, they should:

- Review data on activity/engagement levels by disadvantage (e.g., POLAR quintile) to identify any potential disparities that could be addressed.

- Interview site users to understand how they engage with the platform, what could be behind any disparities and to help boost uptake of any interventions trialled.

- Test approaches via randomised controlled trials (i.e., A/B tests) to assess impact and understand what does and doesn't work.

- Learn and adapt.

Careers advice providers should invest in further, more sustained interventions and research to tackle differences in engagement and aspiration between groups of students, for example:

- Boosting aspiration of female students and engagement of male students.

- Targeted interventions to support the most disadvantaged students.

Further research into supporting disadvantaged young people to engage with high quality careers advice is needed. We identified some potential areas through our evidence review:

- Boosting uptake of face-to-face careers guidance through digital messaging.

- Boosting social capital through work experience or employer exposure.

- Improving parents' understanding of career decisions and parental engagement.

Introduction

Background

Disadvantaged pupils tend to move into less lucrative careers than their more advantaged peers, even when their attainment is higher.[9] The Social Mobility Commission (SMC) has a strong interest in practical, action-oriented research to change this; in this report the SMC commissioned the Behavioural Insights Team (BIT) to specifically investigate whether low-cost behavioural nudges on online platforms could be one effective mechanism to boost disadvantaged pupils career engagement and aspiration.

Research shows that career information and guidance (CIAG) can support social mobility by countering entrenched stereotypes and beliefs among some young people that certain jobs are 'not for me'.[10] CIAG can also bridge the resource gap (including knowledge and contacts) between more and less advantaged groups.[11]

However, research- such as the ASPIRES 2 survey of year 10 students - indicates that young people from less advantaged backgrounds are less likely to receive career support.[12] Recent research finds that CIAG is an important factor in helping young people progress to fruitful post-school destinations but that learners from disadvantaged backgrounds "face particular barriers and are less likely to benefit from support to make informed decisions".[13] What is more, research also suggests young people from disadvantaged backgrounds may be less likely than their peers to engage with careers provision.[14] This means that simply providing more information on careers may not be enough to truly expand horizons.

Digital careers advice platforms are a popular resource both in and outside of school - with some accessed as part of scheduled lessons in collaboration with careers staff. Digital interventions could be used to reach larger audiences - though they have drawbacks, including

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[9] Institute for Fiscal Studies, Intergenerational income persistence between families, 2017.

[10] Chambers, N., Kashefpakdel, T., Rehill, J., Percy, C. Drawing the Future: Exploring the career aspirations of primary school children from around the world, London: Education and Employers, 2018.

[11] Wright, S. Young people's decision-making in 14-19 education and training: A review of the literature. Nuffield Review of 14-19 Education and Training Briefing Paper 4. Oxford: Nuffield Review of 14-19 Education and Training, 2005.

[12] Archer, L., Moote, J. . ASPIRES 2 Project Spotlight: Year 11 Students' Views of Careers Education and Work Experience, 2016.

[13] Hughes, D. User insight research into post-16 choices: Research Report. Department for Education, 2017

[14] Greenbank, P., & Hepworth, S. Working class students and the career decision making process: a qualitative study. 2008.

that some groups have limited access to the internet except through 'crowded facilities' at school and there could also be a risk that some young people do not trust the resources.[15]

The aim of this project was to increase both engagement with digital CIAG and aspiration levels among disadvantaged young people, in order to support careers decision-making. Engagement with digital careers guidance (e.g., reviewing more career options, viewing courses of interest) should help young people become better informed about the options available to them and what they need to do to achieve each option. Activities to help young people consider more aspirational options could help prevent young people from ruling out options due to potential misconceptions.

Partner information

The Behavioural Insights Team (BIT) partnered with two digital careers advice platforms on this research. We partnered with Unifrog, as it is the number one online career service platform in the UK with more than 1,000 partnering schools, and we partnered with GetMyFirstJob, as it is an emerging platform that offers services (especially on apprenticeships) that are distinctive from Unifrog.

- **Unifrog[16]** helps students in years 9-13 (age 13-18) to learn about career options, build a CV, explore specific destinations and draft personal statements with teacher feedback. It has approximately 450,000 unique users in years 9-13 at over 1000 schools in the UK. Approximately 110,000 of these users come from disadvantaged backgrounds (based on POLAR3 classification).[17]
- **GetMyFirstJob[18]** helps young people aged 14+ to find their first step on the career ladder by listing vacancies (from work experience to apprenticeships or graduate jobs) and providing career guidance. It has roughly 23,000 unique users per quarter, of which about 9,000 are from disadvantaged backgrounds (based on POLAR3 classification). Around 15,000 users on the platform each quarter are aged 19 or under. Approximately 6,400 are aged 19 and under and are from disadvantaged backgrounds.

The websites are distinct in several ways, outlined in the table below. Unifrog is mostly used by students aged 15-17, while GetMyFirstJob is used by students aged 14+ although the median age is 17.5. They also differ in the activities and advice offered on each platform.

	Unifrog	GetMyFirstJob
Main focus	Learning about study or career options and shortlisting/applying to further and higher education courses.	Applying to specific job vacancies - from work experience to graduate jobs.

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[15] Department for Education, DfE. Informed Choice: how data and tools are used to make career decisions: CooperGibson Research Report. 2017.

[16] https://www.unifrog.org/about

[17] POLAR is a classification of young people across the UK based on participation in higher education (HE). POLAR3 was published in 2012 and at the time was the most up to date classification.

[18] https://www.getmyfirstjob.co.uk/OurStory/AboutUs.aspx

Career advice offered	- Information about different careers and study options (including specific courses); - Support on thinking about competencies and areas of interest; - Support for applying to university/ apprenticeships and writing CVs or personal statements.	- Information about different industries and post-school options (e.g., work experience, university, gap year); - Tips on building your CV or preparing for interviews, plus a career quiz.
How the platform is used	Primarily in school with teacher supervision.	Mostly at home (i.e., on your own).
Typical age	Users range from year 9 to 13 but it is used mostly by year 11 and 12 students (i.e., aged 15 to 17).	Users can be from age 14+ but the median age is 17.5.

Research aims and structure

The overarching research question for this project is: *'Can behaviourally-informed interventions increase engagement with digital careers advice among young people from disadvantaged backgrounds?'*

The research follows BIT's TESTS methodology, set out in Figure 1 below. This approach offers a structured way to explore the behavioural factors that influence student decision-making in real life and develop evidence-based interventions.

Figure 1. BIT's TESTS methodology

Target		Define the problem and determine the measurable target outcomes.
Explore		Map relevant behaviours and the wider context.
Solution		Consider and design the intervention(s).
Trial		Design and launch trial, evaluate, learn and adapt.
Scale		Increase adoption of effective interventions.

This report focuses on the first four stages of this process - target, explore, solution and trial. The first three stages are summarised in Section 2 of this report. Section 3 details the interventions that were used for the control and treatment groups. Section 4 explains the trial methodology, including the outcome measures we collected and the analysis strategy we used. Section 5 details the results of the trial.

Careers advice for disadvantaged people

Recent research finds that CIAG is an important factor in helping young people progress to fruitful post-school destinations but that learners from disadvantaged backgrounds "face particular barriers and are less likely to benefit from support to make informed decisions".[19]

This research wanted to test ideas to increase the breadth of careers guidance young people saw and the time spent on CIAG activities. Working with the SMC, we focused on an overarching research question for the project:

'Can behaviourally-informed interventions increase engagement with digital careers advice among young people from disadvantaged backgrounds?'

Barriers

We carried out a rapid evidence review to understand which interventions might be most effective at increasing engagement of young people from disadvantaged backgrounds with digital careers advice (set out in the below table). We found a number of barriers, including intrinsic factors such as self-efficacy, as well as external factors, such as access to careers within their social networks.

Behavioural Insight	Barriers to engaging with formal career education
Present bias	- Present bias describes the tendency for people to overvalue immediate rewards at the expense of their long-term intentions. - Disadvantaged pupils are particularly prone to present bias.[20] This may make it hard for young people to appreciate the benefit of putting in effort now (for example, using a digital careers platform) for career options which may be a long way in the future.
Low self-efficacy	- If we have low self-efficacy in a task, then we do not believe that we can effectively perform that task.[21] 'Working class' pupils report reluctance to engage with careers services due to being intimidated by careers advisers and being

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[19] Hughes. D. User insight research into post-16 choices: Research Report. Department for Education. 2017.

[20] Lavecchia et al. Behavioural Economics of Education: Progress and Possibilities, 2015.

[21] Bandura. A. Social Foundations of Thought and Action: A Social Cognitive Theory, 1986.

	concerned that their lack of knowledge about careers issues could result in embarrassment or even humiliation.[22]
	Disadvantaged young people may be less secure in their beliefs that their career search endeavours would be successful and therefore less likely to engage in these behaviours.
A preference for 'hot' information	● Disadvantaged pupils are particularly likely to value 'hot' information - advice from their social networks - rather than the 'cold' information in careers advice materials.[23]
	Therefore, disadvantaged young people may not perceive digital careers' advice as providing valuable or trustworthy information.
Social norms	● Disadvantaged pupils are likely to hold career aspirations based on the careers they observe in their family and community. Therefore, these pupils tend to have a narrower view of options which are available or desirable for 'someone like them'.[24] [25]
	● Cultural ties mean these pupils face higher psychological and social costs when considering options which would require them to leave their local area.[26] [27]
	Therefore, disadvantaged pupils may seek information on a narrow range of careers and may not be aware of other options.
Confirmation bias	● Confirmation bias describes the tendency for people to seek out or evaluate information in a way that fits with their existing thinking and preconceptions. If disadvantaged pupils already have strong prior assumptions about what opportunities are open to them (see point above), they may be more inclined to absorb information that aligns with, rather than challenges, these views.
	Again, this strengthens the tendency of disadvantaged pupils to only seek a narrow range of information.
Risk aversion	● As a rule, humans are naturally risk averse. Disadvantaged pupils are particularly averse to student debt and are more likely to see higher education as a risky option.[28]
	Therefore, some disadvantaged pupils might prematurely rule out higher education options.

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[22] Greenbank. P., Hepworth. S. Improving the career decision-making behaviour of working class students. 2008.
[23] Mangan. J., Slack. K, Hughes. A. Developing effective Information, Advice and Guidance (IAG) to support informed HE decision making among young people. 2014.
[24]Bright. J., The chaos theory of careers: A new perspective on working in the twenty-first century. 2011.
[25] Willis. P., How working class kids get working class jobs. 1977.
[26] Hughes. D, Law. B, Meijers. F. New school for the old school: Career guidance and counselling in education. 2017.
[27] Gibbons, S., & Vignoles, A. Access, choice and participation in higher education. 2009.
[28] Department for Business, Innovation and Skills. Understanding progression into higher education for disadvantaged and under-represented groups. 2015

Limited attention and choice overload	• Standard economic theory assumes that individuals consider all the information available to them when making decisions. However, it is more accurate to see attention as a scarce resource which means some options are overlooked - in other words, we have limited attention.
	• The effects of limited attention are worse for disadvantaged students.[29]
	• Being exposed to large amounts of information or different choices can also result in choice overload (Diamond et al., 2014).
	Therefore, when faced with a lot of information, pupils might fall back on simple rules of thumb for making choices, rather than engaging with information more fully. This can lead them to have incomplete information about the costs and benefits of the options open to them.
Intention-action gap	• Even when pupils are willing to engage with careers advice, sometimes they do not get around to it - this is known as the 'intention-action' gap. This is likely to be more common for students with part-time jobs or extra responsibilities at home.
	This could mean that a pupil intends to research multiple different options but fails to do so.

These key barriers show that young people from disadvantaged backgrounds lack access to a range of careers advice and experience through their social networks, but even when they are able to access it, they will face barriers in making the most of the advice provided. Low self-efficacy, a bias towards immediate gains and confirmation of existing thinking are likely to lead to lower engagement for disadvantaged students.

Potential behavioural interventions

Based on the rapid evidence review and building on our previous experience and knowledge, we identified a range of interventions that might address some of the barriers highlighted. These are grouped into four broad categories: attitudinal interventions, goal-setting, informative nudges and other interventions.

Attitudinal interventions

Career self-efficacy (a pupil's belief in their ability to engage with career advice effectively) has been identified as a key barrier to positive career engagement.[30] [31] As self-efficacy is thought to be malleable, it is possible that interventions which seek to bolster self-efficacy could help tackle this issue.[32] The behavioural science literature provides empirical evidence on how light-touch interventions designed to bolster an individual's beliefs about their ability to succeed at a task

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[29] Avery, C., Kane T.J., Student Perceptions of College Opportunities: The Boston COACH Program. 2004.

[30] Solberg, V.S., Good, G.E. & Nord, D. Career search self-efficacy: Ripe for applications and intervention programming. 1994.

[31] Strohm, D. The impact of a cognitive information processing intervention on dysfunctional career thoughts and vocational identity in high school students. 2008.

[32] Bandura, A. Social foundations of thought and action. 1986.

can have a disproportionately large effect on education outcomes.[33] However, the low self-efficacy reported in the literature appears to relate primarily to individuals interacting with careers advisors rather than digital CIAG; therefore, it is not clear that this approach is the best option for this project.

We consider whether, as argued in the careers advice literature, getting pupils to engage in activities that challenge their taken-for-granted assumptions and biases may encourage them to develop alternative approaches to career decision-making.[34,35] Looking to the behavioural science literature, there are a number of papers which demonstrate how 'self-persuasion' exercises, in which individuals are asked to reflect on the value of a particular behaviour and write about it, can have a positive impact on a range of education outcomes.[36,37,38] These interventions are thought to be effective because we are more convinced by our own arguments than those of other people. In the context of the current project, they may indeed increase pupils' perception of the value of CIAG and therefore motivate them to engage.

Goal-setting

There is an evidence base for the use of goal-setting interventions to help people achieve certain tasks. For example, in a US university, when students were asked to set goals to complete online practice exams there was a sizeable effect on the number of individuals completing this task.[39] Similarly, when students on a MOOC were invited to set a goal to limit their time on distracting websites there was a positive impact on course effort, homework completion, grades and course completion.[40] Therefore, this may be an effective approach to encourage pupils to engage with particular aspects of digital careers advice platforms.

However, it is important to note that these interventions seem to be effective where there is some prior motivation to complete the relevant behaviour.[41] Therefore, in this context it seems pertinent to combine a goal-setting intervention with another intervention which might increase pupils' overall motivation to engage with CIAG.

Informative nudges

Disadvantaged young people are less likely to be aware that they ought to be spending time engaging with careers advice and they are also less likely to have information on a wide range of career options.[42] Individualised information and information on the world of work have been

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[33] Damgaard, M., Nielsen, H. Nudging in education. 2018.

[34] Greenbank, P. An examination of the role of values in working class students' career decision-making. 2009.

[35] Greenbank, P., Hepworth, S. Improving the career decision-making behaviour of working class students. 2008.

[36] Canning, E., Harackiewicz, J. Teach It, Don't Preach It: The Differential Effects of Directly Communicated and Self-Generated Utility–Value Information. 2015.

[37] Hulleman, C. S., Harackiewicz, J. M. Promoting Interest and Performance in High School Science Classes. 2009.

[38] Yeager, D., et al. Attitudes and Social Cognition: Boring but Important: A Self-Transcendent Purpose for Learning Fosters Academic Self-Regulation. 2014.

[39] Clark, D., Gill, D., Prowse, V., Rush, M. Using Goals to Motivate college Students: Theory and Evidence from Field Experiments. 2017.

[40] Patterson, R. Can Behavioral Tools Improve Online Student Outcomes? Experimental Evidence from a Massive Open Online Course. 2015.

[41] Damgaard, M., Nielsen, H. Nudging in education. 2018.

[42] Greenbank, P., & Hepworth, S. Improving the career decision-making behaviour of working-class students. 2008.

identified as promising interventions to address these issues[43] and a number of trials from the behavioural science literature have demonstrated that 'informative nudges' (i.e. interventions designed to improve knowledge about the costs and benefits of educational investments) can improve a range of outcomes in education and job search behaviour.[44]

For example, an RCT in Scotland tested the effect of providing job seekers with semi-customised information on jobs they might be qualified for via an online platform. When searching for one type of occupation, they were provided with related job searches based on their area of interest.[45] The intervention led job seekers to increase the breadth of job information they accessed and had the biggest impact for those who initially searched narrowly. There was some weak evidence of a positive impact on the number of job interviews secured. In the context of the current project, such an intervention could help pupils access a broader range of platform content.

Other interventions

Social norms are a barrier to disadvantaged young people fully engaging with careers advice[46] and pupils from 'working-class' backgrounds are more likely to value informal ('hot') information rather than formal ('cold') information.[47] Therefore, we suggest it will be important to feature young people in our interventions as relatable messengers.

Digital games have also been proposed as an engaging approach to conveying CIAG but this does not appear to have been rigorously tested.[48,49]

We also found evidence for interventions which would not be possible for this trial, but may be of interest to the Social Mobility Commission for future research:

- **Boosting uptake of face-to-face careers guidance:** Some commentators argue that digital resources should be a supplement to other forms of CIAG, not a replacement.[50] The literature also suggests that pupils prefer face-to-face, trusted, authoritative guidance and may not be able to extract value from sites without adult support.[51] Therefore, interventions which prompt pupils to access face-to-face support might be a fruitful focus for future research.

- **Boosting social capital:** Advantaged students typically benefit more from their social networks than other students; for example, they are likely to be able to draw on family

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[43] Hilliam, R., Arrowsmith, G. Enhancing the student experience with the use of a dedicated subject website. 2019

[44] McNally, S. How important is career information and advice? 2016.

[45] Belot, M., Kircher, P., Muller, P. Providing Advice to Jobseekers at Low Cost: An Experimental Study on Online Advice. 2019.

[46] Greenbank, P., Hepworth, S. Improving the career decision-making behaviour of working-class students. 2008.

[47] Greenbank, P. . An examination of the role of values in working-class students' career decision-making. 2009.

[48] Dunwell, I, et al. Providing Career Guidance to Adolescents through Digital Games. 2014.

[49] Moffat, D., Farrell, D., Gardiner, B., McCulloch, A., Fairlie, F., A Serious Game to Give Students Careers Advice, Awareness and Action. In Jefferies, A., Cubric, M. (eds) Proceedings of the 14th European Conference on e-learning. 2015.

[50] Vigurs, K., Everitt, J. and Staunton, T. The evidence base for careers websites. What works? 2017.

[51] Evans, J., Rallings, J. Helping the inbetweeners: ensuring careers advice improves the options for all young people. 2013.

and friends to secure work experience opportunities.[52] Interventions which help pupils build their social capital, such as work experience and employer exposure, are likely to be particularly valuable for disadvantaged students.[53]

● **Boosting parents' understanding of career decisions:** Parents are a crucial source of support for all students, but some parents feel unprepared to support their children's career decisions.[54,55] Therefore, interventions to help parents support their children could be an effective way of improving career outcomes for students. For example, an RCT in the USA tested the effect of providing parents with information on the utility of STEM (science, technology, engineering and maths) careers and found this was an effective way of driving STEM course uptake.[56]

Overall, we found relevant interventions from the literature that may help to tackle some of the barriers listed previously. Interventions that help tackle attitudinal barriers, such as low self-efficacy, have shown promise in other settings, and interventions that focus on goal-setting and providing timely information have also proven to be effective. We also found potential behavioural interventions that would not be possible to trial in this research project but could be explored in future work.

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[52] Mann, A., Dawins, J. Employer engagement in education: literature review. 2014.

[53] Mountford-Zimdars, A., et al. What can universities do to support all their students to progress successfully throughout their time at university? 2017.

[54] Collins, B., Cash, M. Careers advice for 14 – 19 year olds in Dorset: Parents' perceptions and needs. 2014.

[55] Harackiewicz, J. M., et al. Helping Parents to Motivate Adolescents in Mathematics and Science. 2012.

[56] Rozek, C. S., et al. Utility-value intervention with parents increases students' STEM preparation and career pursuit. 2017.

Interventions

Based on the evidence review that identified attitudinal barriers, as well as barriers to accessing information, we chose the following interventions:

- **A motivational activity** which included an exercise where students reflect on the societal value of learning about careers (self-persuasion with a prosocial prompt) and a goal-setting exercise (i.e., setting personal goals for completing certain tasks on the digital career platform). During this activity, pupils were also exposed to testimonials from other young people about the value of CIAG which were designed to bolster their sense of belonging when accessing careers advice.

- **Informative and belonging-oriented nudges** built into platforms to encourage pupils to view a wider and more aspirational range of course and career options than they might have otherwise.

As both digital CIAG platforms operate differently, each intervention was tailored to the platform as follows. Full details of the interventions are included in Appendix A.

Condition	Description
Motivational activity	The motivational activity is a short activity on the digital careers platform. It was not compulsory but was sign-posted prominently on the homepage. Young people did this activity at their own pace.
	In the case of Unifrog, teachers could actively encourage their students to complete this activity, but they would only do so in this project if uptake was slow - so as to minimize threats to external validity (further detail on teachers' interaction with the intervention is covered later in this document).
	The activity had five stages. The first four stages were based on the idea of self-persuasion, discussed above. The last stage was goal-setting.
	1. Users were first prompted to think outside of themselves and about how the world could be a better place. This is thought to prime prosocial thinking and lay the groundwork for developing a

	self-transcendental motivation (which has been found to be more effective than self-oriented motivation alone).[57]
	2. Users saw statistics that create social norms about how, how much, when and why, other young people like them engage with careers advice (to create a social norm around CIAG engagement and self-transcendental motivation for doing so).
	3. Users saw testimonials from other relatable pupils about how they use careers advice. These messages included a belonging component, i.e., reassurance that although learning about careers can be intimidating, you have more options than you realise.
	4. Users wrote their own short message about the kind of person they want to be in the future and the value of careers advice for reaching their goals.
	5. Users set goals about how to use the platform (focusing on activities particularly likely to help pupils make informed choices, based on the experience of the platform designers).
	See Appendix A for the activity content developed for Unifrog and GetMyFirstJob.
Motivational activity + informative nudges	As above, but with the inclusion of informative nudges that also include a belonging message. When young people were looking at information about one post-school route, they were directed to look at other similar options (in terms of subject area) that were more aspirational (in terms of either qualifications required or typical future earnings), or at options in other types of institutions (e.g., higher education, apprenticeships and further education options). The prompts included reassurance to encourage feelings of belonging and reduce anxiety about aspirational options. See Appendix A for the nudges developed for Unifrog and GetMyFirstJob.
Control	The control was business as usual on both sites, as this is the most accurate point of comparison.[58] For GetMyFirstJob, there was a low risk of spillover (students in the control group being affected by those in the intervention group) as young people tend to use the site alone (as far as GetMyFirstJob knows).

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[57] Yeager, D., et al. Attitudes and Social Cognition: Boring but Important: A Self-Transcendent Purpose for Learning Fosters Academic Self-Regulation. 2014.

[58] If we had a placebo activity for the control group, this would remove 5 to 10 minutes of the control group's time for engaging with career advice - making the intervention activity appear unfairly effective in comparison.

For Unifrog, <u>risk of spillover was higher</u> as young people use the platform in lessons and do sometimes discuss career activities with each other. To minimise this risk, particularly with the motivational activity - which is more likely to trigger discussion than the smaller nudges - we:

1. Sent teachers instructions to encourage quiet, independent completion of site activities the week that the motivational activity appears.

2. Included a prompt to complete the motivational activity in silence on the site.

In reality, given the impact of the COVID-19 pandemic, some spillover effects on Unifrog were reduced.

Trial methodology

Aims

The purpose of this trial was to assess whether an online motivational activity plus informative, belonging-oriented nudges improve student engagement with digital careers advice among disadvantaged young people.

Evaluation methodology

Evaluation design

We ran two independent randomised controlled trials (RCTs) as part of this research - one on Unifrog and one on GetMyFirstJob. Both trials tested similar interventions (as outlined in the previous section) but with contextual differences to match each platform's individual specifics and metrics. For each platform, we ran a three-armed RCT with young people equally distributed across the trial arms.

In an RCT, the sample of participants is split into groups (also known as 'arms') randomly, with one or more groups receiving the intervention(s), and another group receiving a business as usual (BAU) service. We can then compare the outcomes across groups and attribute differences to the intervention received during the trial. In this trial the students using the digital career advice platforms were split into three groups on each platform: two separate intervention groups, and a 'business as usual' control condition. This design allowed us to test two different interventions and compare these to business as usual so we could measure the impact of each intervention robustly.

Sample selection and eligibility

This project focused on disadvantaged pupils of secondary school age in England in Year 9 or above. The table below gives details of the sample characteristics.

	Eligibility criteria
Age / year	**Age 13 to 19** ● GetMyFirstJob: Age 14 to 19 ● Unifrog: Year 9 to 12 (i.e., age 13/14 to 17/18)

POLAR quintile	**POLAR 1 and 2 only** (all users received the interventions, but we will only measured outcomes for POLAR 1 and 2)
School type and location	Unifrog: **State-funded English secondary schools** (Not applicable for GetMyFirstJob)

The design of the RCTs together with project timeline and sample size are shown below in Figure 2.

Figure 2. The design, timeline, and sample size of two RCTs that tested the effects of motivational activity and informational nudges against 'business as usual'.
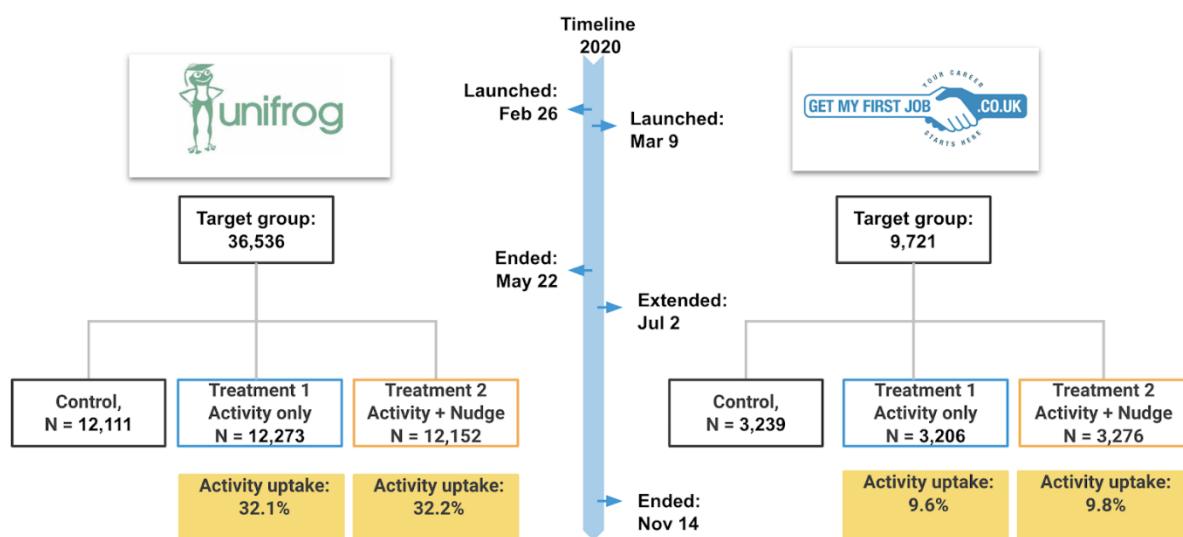
Outcome measures

The two interventions which we are testing have two slightly different aims:

● The motivational activity primarily aims to increase pupils' **engagement** or motivation to engage with the platform content (e.g., spend more time on the site, complete more activities). It may also have an impact on aspiration.

  ● The informative and belonging-oriented nudges aim to increase the **aspiration** of content pupils view (in terms of qualification level or median salary).

However, we had several challenges in designing outcome measures that capture users' engagement level and aspiration level. First, the two platforms had distinctive user-interface designs and features and it was not possible to find outcome measures that were applicable to both platforms. Second, the most relevant metrics were not available (e.g., for engagement, we ideally would have liked to track time on site, but neither site tracks this).

As a result, we chose a set of measures that were most closely related to engagement and aspiration as our primary measures to account for the various ways in which users can engage with each of the two platforms.

After reviewing the available data from Unifrog and GetMyFirstJob and analysing the sensitivity of potential outcome measures by disadvantage (POLAR quintiles), we decided to use the following outcome measures for each platform.

Primary outcomes for Unifrog:

Aspiration[59]

Aspirational level was measured by the following three items:

- Aspiration level of university shortlisted, in relation to young people's attainment (aspirational = 3, solid = 2, safe = 1)
- Aspiration level of apprenticeship/further education courses shortlisted in relation to young people's attainment (aspirational = 3, solid = 2, safe = 1)
  - Average median salary of careers favourited

Engagement

Engagement was measured by the following two items:

- Total number of course shortlists made (universities, apprenticeships, further education)
- Total number of careers favourited[60]

Primary outcomes for GetMyFirstJob:

Aspiration

Aspirational level was measured by the following four items:

- Level of vacancies viewed (2 = lowest, 7 = highest)[61]
- Level of vacancies applied for (2 = lowest, 7 = highest)
- Median hourly wage of vacancies viewed (£)
  - Median hourly wage of vacancies applied for (£)

Engagement

Engagement was measured by the following two items:

- Number of vacancies viewed
  - Number of vacancies applied for

---

[59] Aspiration scale is tailored to an individual based on their GCSE/A level scores.

[60] On Unifrog, students can browse and create shortlists of courses they are interested in. Similarly, they can 'favourite' careers, selecting particular careers, while browsing.

[61] Level 2 = intermediate, Level 3 = advanced, Level 4 ~ 7 = higher/degree, please visit the GOV.UK for details.

Secondary outcomes for both platforms: Number of logins during the trial period (note: from GetMyFirstJob, this is 'number of login days' rather than individual logins).

Analysis strategy

Our research question was to test whether a self-persuasion activity and informative nudges increase young people's engagement with digital career service platforms and encourage them to choose more aspirational career options.

To address the research question, we used OLS regression models to test the effect of the treatments on the primary outcome measures. See Appendix B for the model specifications.

Besides answering the above research question, we also did some exploratory subgroup analysis using the same models to investigate whether the effects of interventions vary by gender, disadvantage (using POLAR (POLAR 1 vs. 2), and school year (Year 9-11 vs. Year 12). Full breakdown is shown in Appendix C.

Since we had more than one primary outcome and three arms, we were making multiple comparisons. This leads to a higher risk of a false discovery (finding significant results by chance). To mitigate this risk, we conducted a multiple-comparison adjustment (the Benjamini-Hochberg procedure) to correct for the large number of comparisons being made. In this report, we only present the results following multiple-comparison adjustment (MCA).

Trial results

We found a small significant increase in engagement on the Unifrog platform - the number of shortlists young people made were slightly increased following our intervention. However, we found no other significant results across outcome measures on both platforms. We discuss our interpretation of these results in Section 5.2.

Results

Aspiration

Unifrog

On Unifrog we found young people in the treatment and control groups had similar aspiration levels of shortlisted universities, apprenticeships & sixth forms and expected median salary after the intervention.

Figure 3. Mean median salary of careers favourited

N=12,586
** p<0.01, * p<0.05, + p<0.1
primary analysis
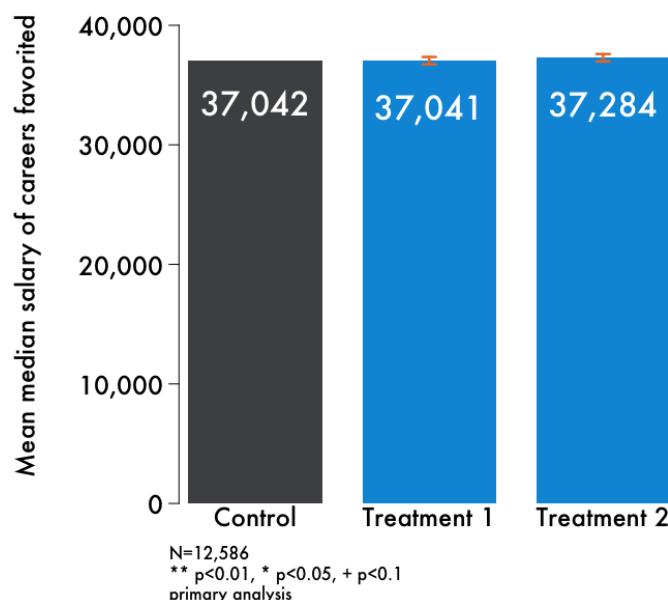
Figure 4. Average aspiration level of universities shortlisted
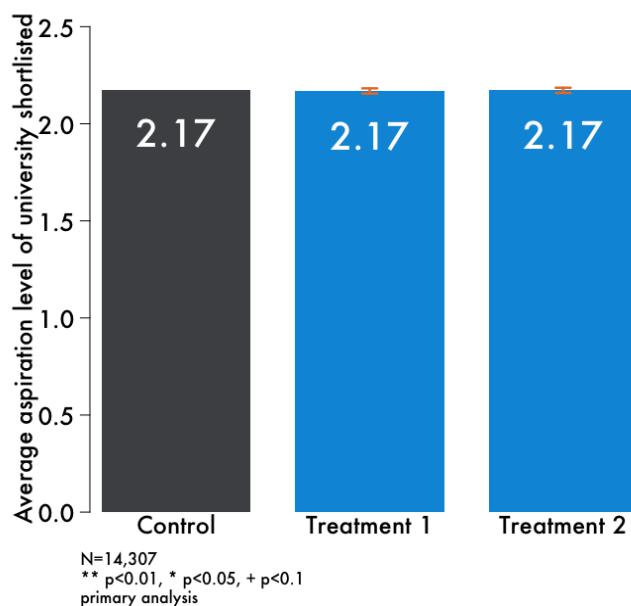
Figure 5. Average aspirational level of apprenticeship and further education shortlisted
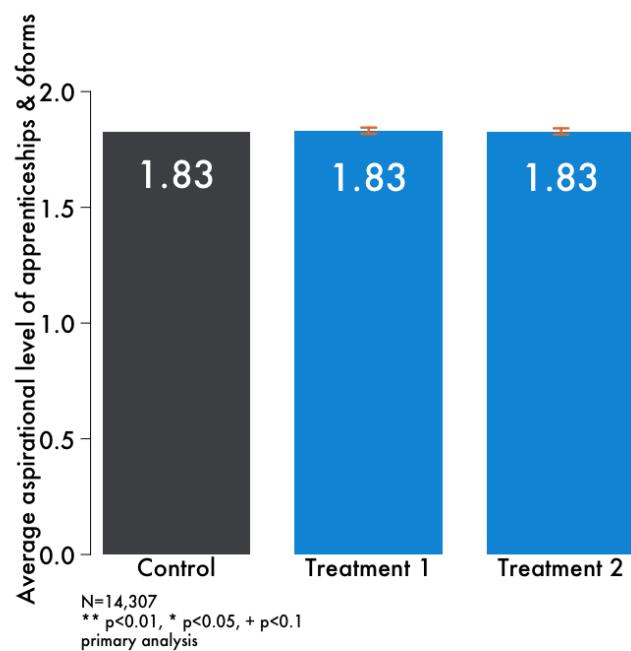
GetMyFirstJob

On GetMyFirstJob young people in the treatment and control groups viewed and applied for similar aspiration levels of vacancies before and after intervention, and median hourly wages were not affected by the intervention.

Figure 6. Aspiration level of vacancies viewed

N=7,111
** p<0.01, * p<0.05, + p<0.1
primary analysis
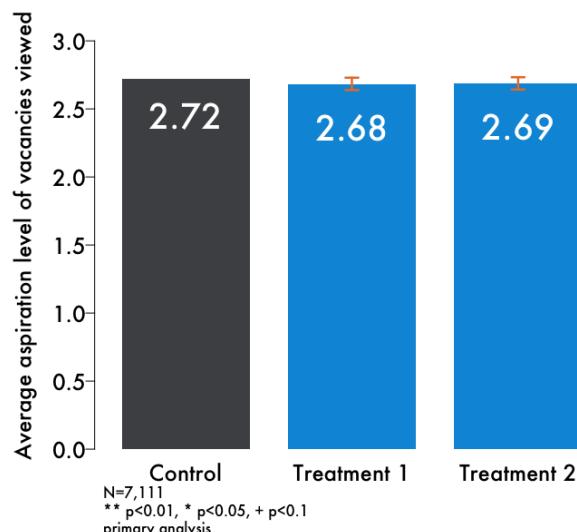
Figure 7. Aspiration level of vacancies applied for

N=7,549
** p<0.01, * p<0.05, + p<0.1
primary analysis
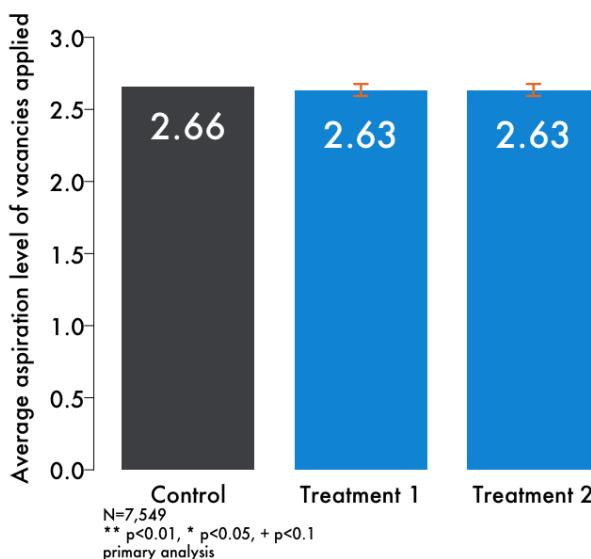
Figure 8. Median hourly wage of vacancies viewed (£)
Note. Significance level adjusted for multiple comparisons

N=7,111
** p<0.01, * p<0.05, + p<0.1
primary analysis
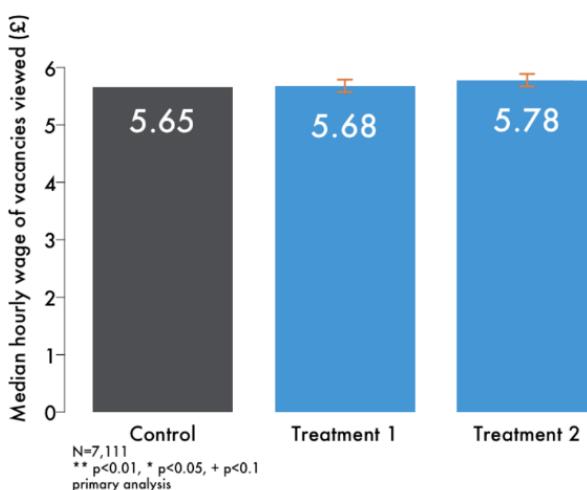
Figure 9. Median hourly wage of vacancies applied for (£)
Note. Significance level adjusted for multiple comparisons

N=7,549
** p<0.01, * p<0.05, + p<0.1
primary analysis
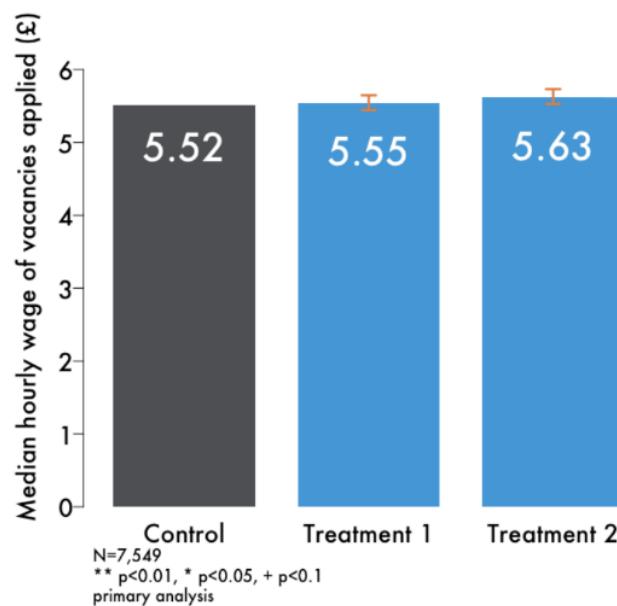
Engagement

Unifrog

On Unifrog we found the intervention increased the number of shortlists young people made in the treatment group compared with the control group. However, the number of careers favourited and number of logins were not increased.

Figure 10. Number of shortlists made
Note. Significance level adjusted for multiple comparisons

N=16,384
** p<0.01, * p<0.05, + p<0.1
primary analysis
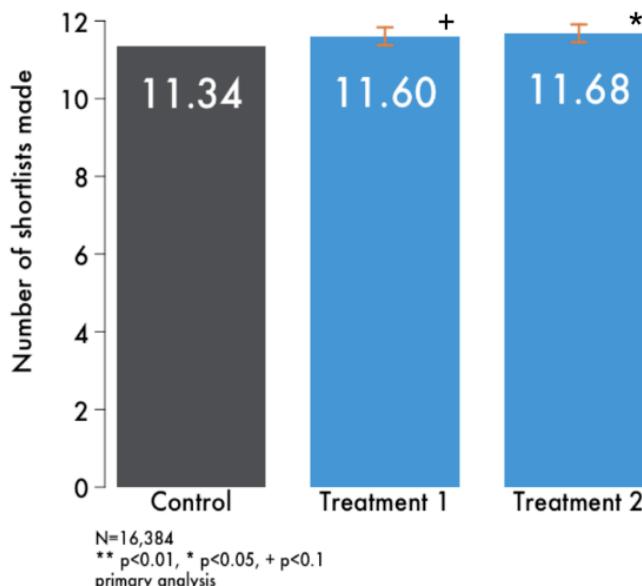
Figure 11. Number of careers favourited

N=12,586
** p<0.01, * p<0.05, + p<0.1
primary analysis
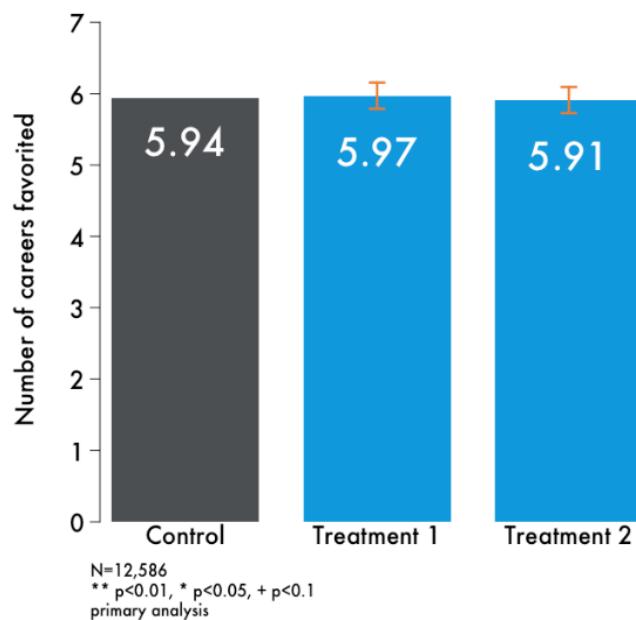
Figure 12. Number of logins

N=35,323
** p<0.01, * p<0.05, + p<0.1
secondary analysis
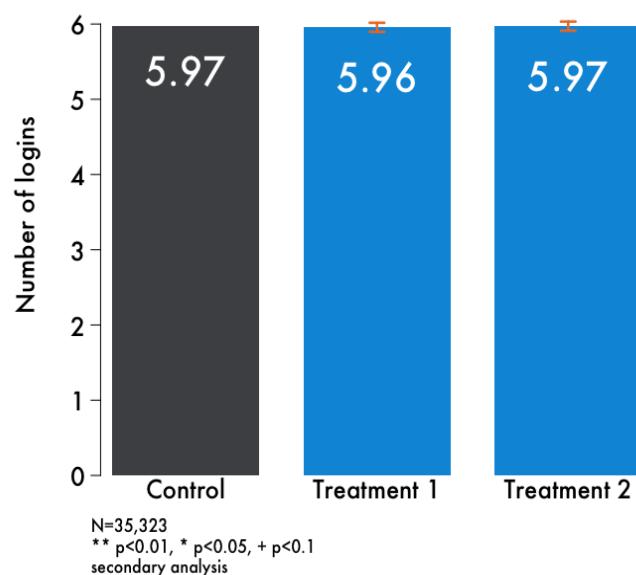
GetMyFirstJob

On GetMyFirstJob there were no significant effects of the intervention on number of vacancies viewed or number of logins.

Figure 13. Number of vacancies viewed

N=7,111
** p<0.01, * p<0.05, + p<0.1
primary analysis
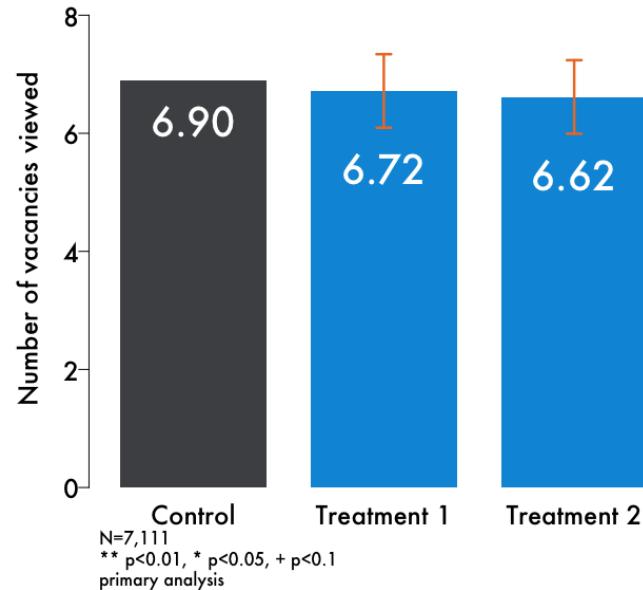
Figure 14. Number of vacancies applied for

N=7,549
** p<0.01, * p<0.05, + p<0.1
primary analysis
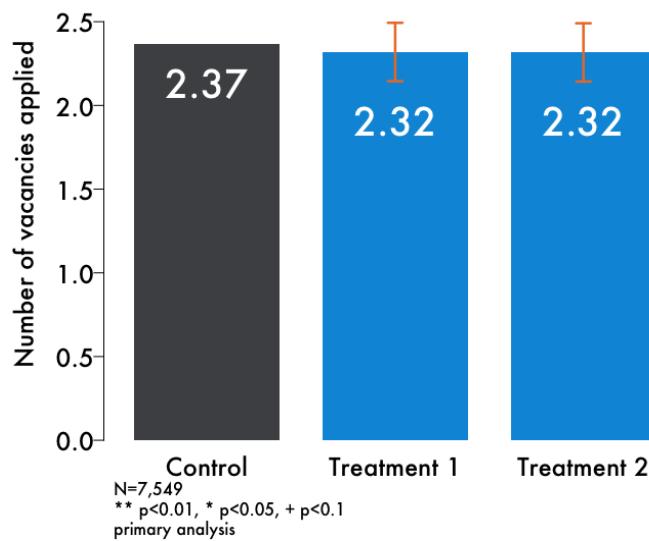
Figure 15. Number of logins

N=9,721
** p<0.01, * p<0.05, + p<0.1
secondary analysis
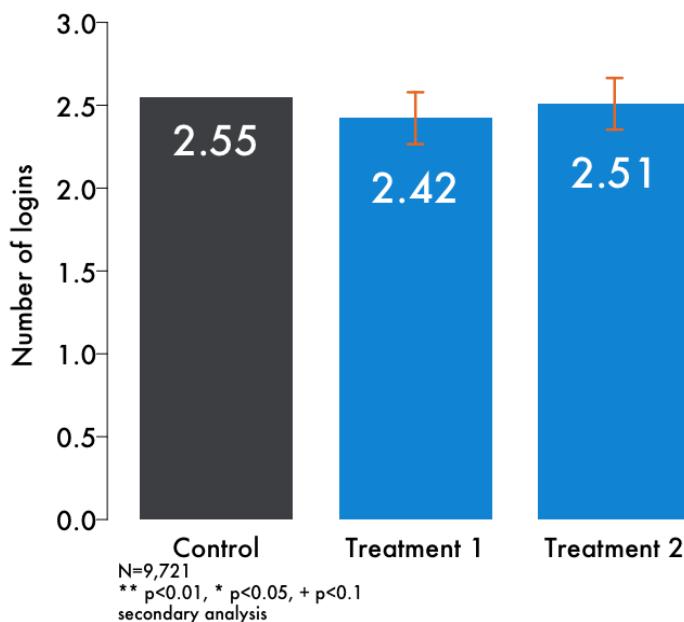
Analysis by demographic

Interestingly, through our analysis we found some differences in aspiration and engagement by gender, year group, and disadvantage (POLAR).[62] These differences, while not caused by our intervention, do shed light on the importance of developing interventions with different demographics in mind. In general, male students had higher aspiration levels but lower engagement levels than female students. On Unifrog, the median salary of the careers male students favoured was significantly higher — a difference of £864 (Figures 16-19). Older students were typically more aspirational than younger ones, and they were also more engaged on Unifrog, though less engaged on GetMyFirstJob. Students who were more advantaged (POLAR 2) were more aspirational and engaged than students from less advantaged backgrounds (POLAR 1). Future research into these differences and potential interventions to tackle them is needed. Distribution plots showing differences in engagement and aspiration by gender are included below. For full details, see Appendix C.

Unifrog
Figures 16 and 17 show the distribution of salaries favoured by female and male students, the average salary favoured for each gender and the number of shortlists made by each gender. This shows that male students, on average, favourite higher salary careers than female students, suggesting higher aspiration for male students. However, male students made fewer shortlists than female students, suggesting lower engagement.

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[62] Based on analysis of the combined control and treatment samples.

**Figure 16. Average salary of favourited careers by gender**
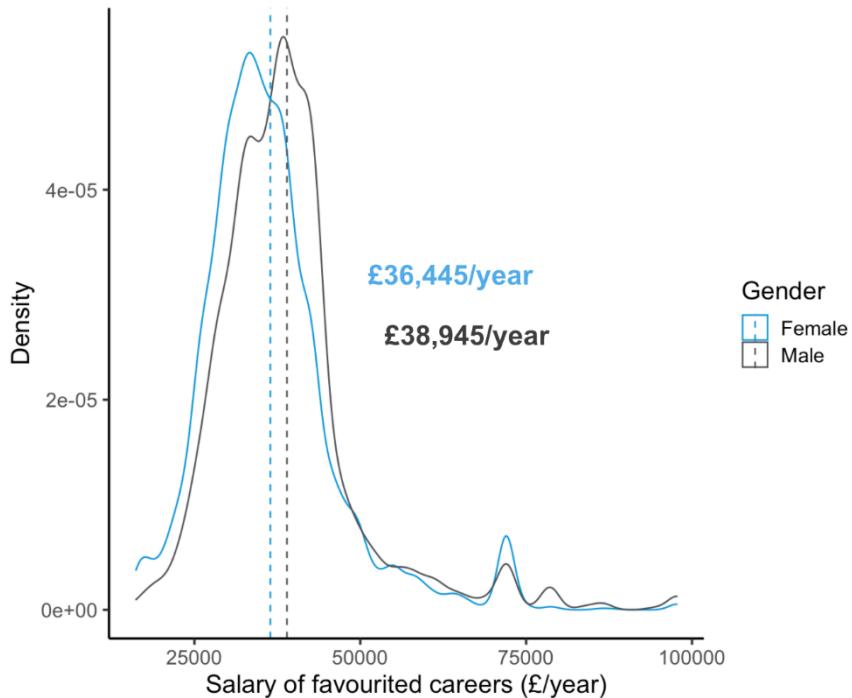
Figure 17. Number of shortlists by gender
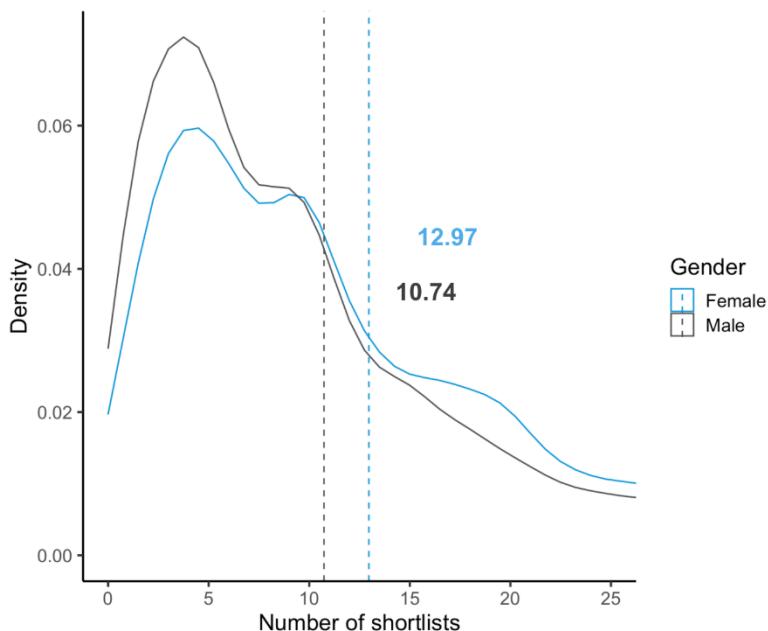
GetMyFirstJob

Figures 18 and 19 show the distribution of hourly wages of jobs applied for by female and male students and the number of vacancies viewed. This shows that male students have higher salary aspirations but are less engaged as they viewed fewer vacancies.

## Figure 18. Hourly wage (£/hour) of jobs applied for by gender
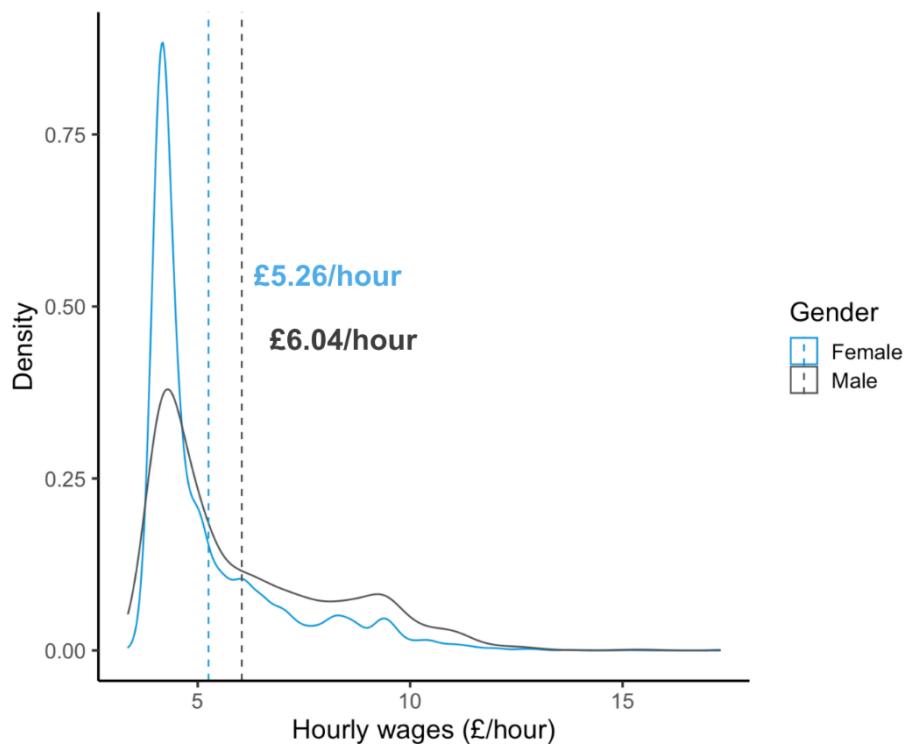
Figure 19. Number of vacancies viewed by gender
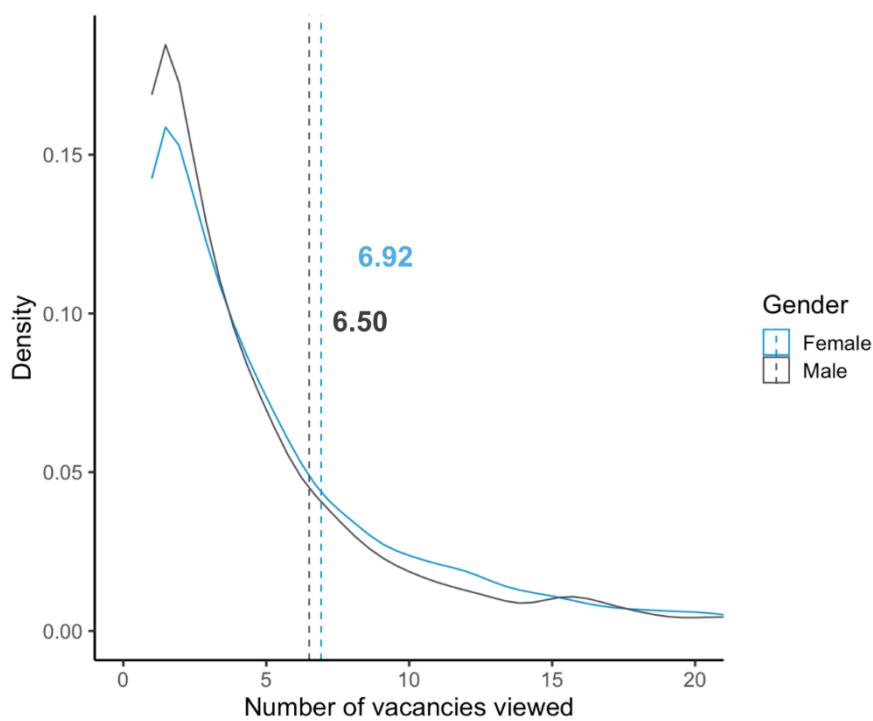
Discussion

Overall, we did not find evidence that these interventions were able to increase engagement or aspiration levels for our target group and had a minimal additional impact. However, testing these kinds of interventions is still valuable. Nudges on digital platforms are incredibly cost effective and easy to embed, so trialling them is important to understand what works, and what doesn't. These types of interventions are unlikely to transform the experience for young people, but they can be effective at shifting behaviours in a low-cost, low-effort way.

This area of research still has limited evidence, so lessons we can learn from this work should be applied to future research.

We faced a few general implementation challenges which might also partially explain why we got null results. Low completion of the motivational activity (the uptake rate was 32% on Unifrog and 10% on GetMyFirstJob) and potentially low views of the other nudges, which depended on young people clicking through to certain parts of the website (we had no means of tracking which nudges were seen), may have diluted the effects of the intervention. This suggests further research to understand how to increase uptake of these types of activities would be useful.

We also faced a host of pandemic-related implementation challenges which may have affected impact. Firstly, it is possible that engagement with the intervention and with online career support in general may have been different given that most of the trial took place during the COVID-19 pandemic - with the Unifrog trial running largely during school closures. This raises issues about the generalisability of findings to more normal times. However, since career education suffered during the pandemic, this topic is particularly important and warrants further research.[63]

Other challenges may also have affected results. On GetMyFirstJob:

- Inspiration was not perfectly captured by salary alone. For example, a more inspired pupil might apply for more high-skilled jobs which were not necessarily higher-paid and as such the motivational activities may have sometimes pushed young people to view higher-skilled but lower-paid jobs. In this case, the effects of interventions might have been under-estimated.

- The nudge to view higher-paid jobs was only visible to a subset of young people because:

- The nudge appeared on the landing page after a young person applied to a job - but roughly a third of young people would be taken off the GetMyFirstJob site to an employer's site when they applied to a job and would therefore not see this nudge.

- There were not always similar better-paid jobs available in a young person's local area.

On Unifrog, we also faced some design challenges that could warrant further exploration:

- We wanted to avoid implying that higher-paid careers were 'better' and as such created a nudge that was subtle and did not make any value judgements over salaries. See Appendix A for an example.

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[63] Sutton Trust. COVID-19 and Social Mobility Impact Brief #3: Apprenticeships. 2020.

- There was already a well-designed nudge to encourage young people to shortlist more aspirational universities, which meant that our additional nudge was likely to be less effective.

Conclusion

Our analysis found that these interventions did not improve students' aspiration or engagement across both platforms. Shifting behaviour on careers advice platforms is challenging - we found that uptake of activities was low and we did not see any effects across engagement or aspiration. However, through our evidence review we found several examples from other areas where similar interventions did have an impact, and evidence on improving digital careers advice is limited so we think further research would be helpful in this area. We also uncovered interesting demographic differences, showing the importance of targeting interventions effectively. While nudges like those trialled in this project are unlikely to transform aspiration for young people, other research shows they can be impactful and are low-cost and low-effort to deliver. More research is needed to find what works in this context.

Recommendations

Careers advice providers should continue to identify and attempt to address any disparities related to disadvantage on their platform. Using lessons from this project, they should:

- Review data on activity/engagement levels by disadvantage (e.g., POLAR quintile) to identify any potential disparities that could be addressed.

- Interview site users to understand how they engage with the platform, what could be behind any disparities and to help boost uptake of any interventions trialled.

- Test approaches via randomised controlled trials (i.e., A/B tests) to assess impact and understand what does and doesn't work.

- Learn and adapt.

Careers advice providers should invest in further, more sustained interventions and research to tackle differences in engagement and aspiration between groups of students, for example:

- Boosting aspiration of female students and engagement of male students.

- Targeted interventions to support the most disadvantaged students.

Further research into supporting disadvantaged young people to engage with high quality careers advice is needed. We identified some potential areas through our evidence review:

- Boosting uptake of face-to-face careers guidance through digital messaging.

- Boosting social capital through work experience or employer exposure.

- Improving parents' understanding of career decisions and parental engagement.

Appendix A

Interventions (Unifrog)

Motivational activity

Home page: The nudge to complete the activity is "Set your career goals for this term". This is not compulsory but will appear on the home page until users click it.
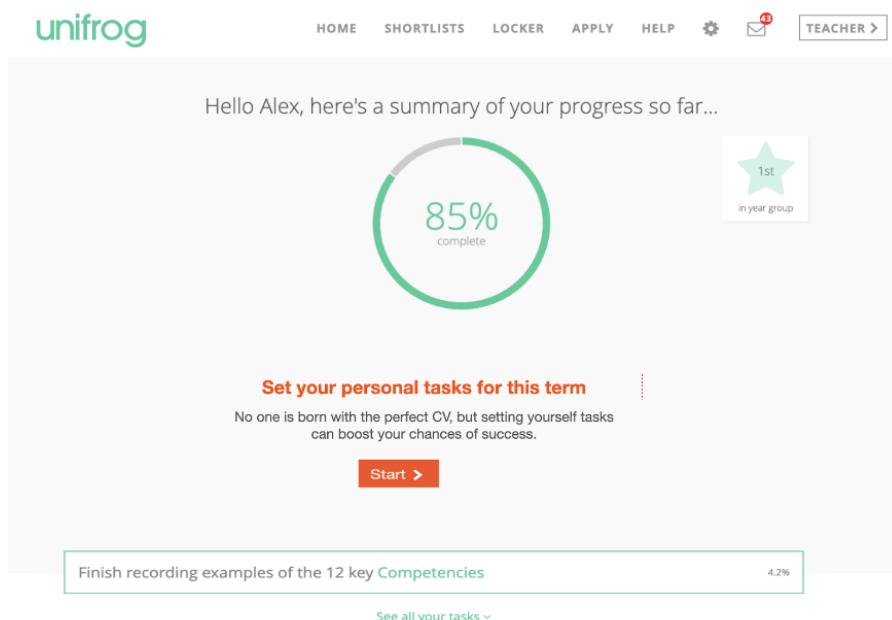
Once the user has completed the goal setting activity, the home page will be updated accordingly:

Step 1 of the activity. This poll aims to tap into 'self-transcendental' motivation, which is more powerful than self-oriented motivation.

- The activity includes a progress tracker so that students can see how many more steps of the activity they need to complete.
- There is a reminder to complete the activity alone (to minimise spillovers).

Step 2 of the activity. Stats and quotes to create a positive social norm around engaging with careers advice and aiming high.

Making a difference

What other young people say about their future

82% said they care about making the world a better place

74% said they want a job where they feel like their work matters

How young people use careers advice to support their future

9 out of 10 use careers advice to find a job that will make a difference

Two thirds say careers activities make them feel more confident about the future

Half get into courses despite having lower grades than advertised

Typically, students on Unifrog make 17 shortlists and favourite 5 careers

next ▸   or go back

Which statement do you relate to the most?

Select one

"I'd like a career which is not just meaningful to myself but meaningful to others around me. Learning about different jobs and what courses you need can get you there." Year 9 student

I relate to this statement the most ›

"I always wanted a job I actually care about, but just thinking about where to study after school made me feel panicky… Like I wasn't good enough to get in anywhere. I picked some aspirational courses as well as safe ones anyway. I ended up getting an aspirational one. I'm so glad I gave it a go." Year 13 student

I relate to this statement the most ›

Step 3 of the activity. How could Unifrog be helpful.

How could Unifrog help you get where you want to go?

This may be shared anonymously with future students to help them make career choices.

How could Unifrog help you get where you want to go?

Eg Blah de blah de blah. De blah de blah de blah…

next ▸   or go back

Step 4 of the activity. Goal-setting.

Select your personal Unifrog tasks for this term
Setting yourself tasks can boost your chances of success.
You can change your selections later if you want

UK university	Make 3 shortlists
Apprenticeships	Make 3 shortlists
Further Education	Make 2 shortlists
Careers library	Favourite 5 profiles

next ▶   or go back

Informative nudges

What the user is doing	What we want to encourage them to do
User is browsing careers	• When a user is looking at a particular career, they are encouraged to look at a related career (based on those which 'people also liked') with better earning potential and/or higher level entry requirements.
User is shortlisting university courses	• After shortlisting universities, users also look at degree apprenticeship options which might work for them.
User is shortlisting apprenticeship options	• When users are reviewing their apprenticeship options they include advanced and higher-level options. • After shortlisting apprenticeship options, users also look at university options which might work for them.
User is shortlisting college/sixth form options	• When users are reviewing the college/sixth form options they include level 3 and level 4 options. • After shortlisting college/sixth form options, users also look at apprenticeship options which might work for them.

Nudge to consider higher-paid careers.

Note, we have made this fairly subtle to avoid implying that earnings should be pupils' main consideration and to avoid any risk of insulting a career the young person is interested in.

Typical UK earnings for Pharmacy Technician: £22,762

People who liked Pharmacy Technician also liked (typical UK earnings in blue):

GP   **£72,019**

Pharmacist   **£42,674**

Pharmacologist	£38,526

Nudges to consider more aspirational universities or technical courses.

Are you sure you want to continue?

We recommend that you have at least 1 course each from **Aspirational**, **Solid** and **Safe** - you've got:

Aspirational 0   Solid 2   Safe 2

Aspirational universities can open doors to good jobs and better salaries.

You probably have a better chance than you think. Almost half of students get in with lower grades than advertised!

Go back and select aspirational options

Are you sure you want to continue?

You've got 1 Course in your Shortlist - **you should go back and add 4.**

There were Level 4-6 courses available but you didn't select any.

People with higher level qualifications tend to earn more money over their lifetime. **Consider going back and selecting some Level 4-6 courses as well.**

next ▶   or go back

Nudges to consider other course types

Screenshot after shortlisting universities	Screenshot after shortlisting further education courses	Screenshot after shortlisting apprenticeships
What to do next... **Want to get paid to do your degree?** If you do a Degree Apprenticeship, you'll earn from day one and your tuition fees will be paid by your employer. Go to Apprenticeship tool ▶	✓ Your Shortlist has been emailed to you. What to do next... **Want to earn while you learn?** Apprentices get paid to work while they get their qualifications, plus they get valuable work experience. Go to Apprenticeship tool ▶ ⊙ Download your Shortlist ⧉ ♥ Before you apply: Check out the Know How library for lots of tips and info on Colleges and Sixth Forms. Where now? Access all the tools on the Home page. Go to Home ▶	✓ Your Shortlist has been emailed to you. What to do next... **Want to get work experience plus a degree?** • Many university degrees offer the chance to work in industry as part of the course. • People with degrees earn on average an extra £12,000 per year. You don't need top grades to get in; last year, 7 out of 10 students who applied with D and E grades at A-level got in. Go to UK universities tool ▶ ⊙ Download your Shortlist and apply for your vacancies ⧉ ♥ Before you apply: Learn more about UK apprenticeships on the Know How library. Where now? Access all the tools on the Home page. Go to Home ▶

Interventions (GetMyFirstJob)

Motivational activity nudge on GetMyFirstJob website

Nudges to consider higher-paid jobs nearby

After applying to a job (for the third to half of vacancies that do not take you to the employer's site), you see this page - *if* there is a higher-paid similar job in the area:

If you click on "Find Higher-Paid Jobs Near You" you go to this page:

Your Job Results

Nudge to consider higher-skilled courses nearby

After applying to an apprenticeship or further education course - where users are not taken to the employer's own site, they will see the following page:

Your Job Results

Appendix B - model specification

To address the primary research question, we used the following OLS regression models to test the effect of the treatments on the outcome measures. The model specification is illustrated as below:

$Y_i^{Outcomes}$ = constant + $\beta_1 Treatment1_i$ +$\beta_2 Treatment2_i$ + $\beta_3 Gender_i$ + $\beta_4 SchoolYear_i$ + $\beta_5 POLAR_i$ + $\beta_6 SchoolType_i$ +e_i

Where:

- $Y_i^{Outcomes}$ denotes the outcome measures for each individual. The details of the outcome measures were elaborated in Section 4.3.

- Treatment1 is a dummy-coded variables:

    o Set to 0 if they are assigned to the control group
    o Set to 1 if they are assigned to the motivational activity only group

- Treatment2 is also a dummy-coded variables:

    o Set to 0 if they are assigned to the control group.
    o Set to 1 if they are assigned to the motivational activity plus informative nudges group

- Gender is a dummy variable (0 = Male, 1 = Female, NA = prefer not to say).

- SchoolYear (9-12) is a covariate that may account for variances among pupils from different school years (we chose this because year 12 is the year in which most study/career decisions are made, while in all younger years use of the site is more speculative - there are also more users in year 12).

    o Set to 0 if they belong to year 9-11
    o Set to 1 if they belong to year 12

- POLAR is a covariate that identifies whether pupils come from a POLAR 1 or POLAR 2 deprived area.[64]

- SchoolType is a dummy-coded covariate (0 = State, 1 = Independent, 2 = others).

    - e denotes the error term.

β_1 and β_2 will capture our effects of interest.

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[64] For the primary analysis, the POLAR vector is a binary vector (1 or 2), and for secondary analysis, it is categorical (1 ~ 2 vs. 3 ~ 5).

Appendix C - results by demographic

Unifrog

Effects of Treatment on Primary (column 1~5) & Secondary (column 6) outcomes using OLS Regression

	Aspiration Uni	Aspiration App6form	Median salary	No. of shortlist	No. of careers	No. of logins
(Intercept)	2.27 **	1.73 **	38491.03 **	8.38 **	5.78 **	5.41 **
	(0.05)	(0.05)	(1292.06)	(0.98)	(0.77)	(0.23)
Treatment 1	-0.01	0.01	-0.32	0.26 *	0.03	-0.02
	(0.01)	(0.01)	(157.72)	(0.12)	(0.09)	(0.03)
Treatment 2	-0.00	0.00	242.62	0.34 **	-0.03	-0.00
	(0.01)	(0.01)	(158.11)	(0.12)	(0.09)	(0.03)
Gender: Male	0.02 **	-0.02 **	864.06 **	-1.17 **	-0.55 **	-0.41 **
	(0.01)	(0.01)	(165.77)	(0.12)	(0.10)	(0.03)
Gender: Other	-0.01	0.01	465.59 **	-1.01 **	-0.36 **	-0.53 **
	(0.01)	(0.01)	(148.65)	(0.11)	(0.09)	(0.03)
yearGroup	-0.04 **	0.04 **	900.44 **	1.51 **	0.03	0.46 **
	(0.01)	(0.01)	(184.88)	(0.18)	(0.11)	(0.03)
School type: Independent	-0.01	0.01	-458.51	3.28 **	0.68	0.79 **
	(0.05)	(0.05)	(1311.48)	(0.98)	(0.78)	(0.23)
School type: State	-0.07	0.07	-2715.07 *	2.00 *	0.39	0.42 +
	(0.05)	(0.05)	(1275.28)	(0.96)	(0.76)	(0.22)
POLAR: POLAR2	0.01 *	-0.01 *	216.73 +	0.15	0.01	0.18 **
	(0.01)	(0.01)	(129.98)	(0.10)	(0.08)	(0.03)
AspirationUni.baseline	0.36 **					
	(0.00)					
AspirationApp6Form.baseline		0.36 **				
		(0.00)				
MedianSalary.baseline			7856.61 **			
			(64.73)			
No.shortlist.baseline				9.43 **		
				(0.05)		
No.career.baseline					5.15 **	
					(0.04)	
No.logins.baseline						5.88 **
						(0.01)
N	14307	14307	12586	16384	12586	35323
R2	0.58	0.58	0.55	0.71	0.59	0.86

** p < 0.01; * p < 0.05; + p < 0.1.

Note 1. For year group, the reference level is year 12.

Note 2. The significance levels of the above table were pre-MCA. After MCA, the significance level for treatment 1 and 2 became marginally significant "+". See below for details.

Multiple comparison adjustment

Since we had 5 primary outcomes and 2 treatment arms, we did the Hochberg procedure to adjust for multiple comparisons. We set the significance value at 0.05 and 0.10 (marginally significant), so the adjusted significance cut-off is calculated as 0.05/10 = 0.005 and 0.1/10 = 0.01 (marginally significant). The next cut-off level is calculated as 0.05 * (2/10) = 0.01 and 0.02 (marginally significant).

We had significant results for one outcome, i.e., number of shortlists, and the p values for treatment 1 and treatment 2 are 0.02 and 0.004. So the results remain significant for treatment 2 after adjustment, and marginally significant for treatment 1.

GetMyFirstJob

Effects of Treatment on Primary (column 1~6) & Secondary (column 7) Outcomes using OLS Regression

	Aspiration viewed	Aspiration applied	Hourly wage viewed	Hourly wage applied	No. of vacancies viewed	No. of vacancies applied	No. of logins
(Intercept)	2.53 **	2.48 **	5.16 **	5.05 **	6.65 **	2.23 **	2.56 **
	(0.02), p = 0.00	(0.02), p = 0.00	(0.05), p = 0.00	(0.05), p = 0.00	(0.29), p = 0.00	(0.08), p = 0.00	(0.07), p = 0.00
Treatment1	-0.04	-0.02	0.02	0.03	-0.19	-0.05	-0.13
	(0.02), p = 0.12	(0.02), p = 0.28	(0.06), p = 0.66	(0.05), p = 0.56	(0.32), p = 0.56	(0.09), p = 0.60	(0.08), p = 0.11
Treatment2	-0.03	-0.02	0.12 *	0.12 *	-0.29	-0.05	-0.04
	(0.02), p = 0.16	(0.02), p = 0.29	(0.06), p = 0.02	(0.05), p = 0.03	(0.32), p = 0.36	(0.09), p = 0.58	(0.08), p = 0.61
Gender: Male	0.27 **	0.24 **	0.76 **	0.71 **	-0.54 *	-0.19 *	-0.15 *
	(0.02), p = 0.00	(0.02), p = 0.00	(0.05), p = 0.00	(0.04), p = 0.00	(0.27), p = 0.05	(0.08), p = 0.01	(0.07), p = 0.03
Gender: Other	0.20	0.28 *	0.12	-0.17	-2.94	-0.59	-0.84 +
	(0.14), p = 0.17	(0.14), p = 0.04	(0.34), p = 0.72	(0.33), p = 0.62	(1.97), p = 0.14	(0.57), p = 0.30	(0.50), p = 0.09
Ethnicity: BAME	0.11 **	0.11 **	0.19 **	0.19 **	1.21 **	0.62 **	0.11
	(0.02), p = 0.00	(0.02), p = 0.00	(0.05), p = 0.00	(0.05), p = 0.00	(0.31), p = 0.00	(0.09), p = 0.00	(0.08), p = 0.16
Age	0.15 **	0.14 **	0.27 **	0.29 **	-0.02	0.04	0.06 +
	(0.01), p = 0.00	(0.01), p = 0.00	(0.02), p = 0.00	(0.02), p = 0.00	(0.13), p = 0.87	(0.04), p = 0.22	(0.03), p = 0.05
POLAR: POLAR2	0.10 **	0.10 **	0.26 **	0.27 **	0.34	0.12	0.06
	(0.02), p = 0.00	(0.02), p = 0.00	(0.05), p = 0.00	(0.04), p = 0.00	(0.26), p = 0.19	(0.07), p = 0.11	(0.07), p = 0.40
N	7111	7549	7111	7549	7111	7549	9721
R2	0.07	0.07	0.07	0.07	0.00	0.01	0.00

Note. The significance levels of the above table were not adjusted for multiple comparison adjustments (MCA). After MCA, the significance level for treatment 1 and 2 became non-significant. See below for details.

Multiple comparison adjustment

For GetMyFirstJob, we had 6 primary outcomes and 2 treatment arms. Similarly, we did the Hochberg procedure to adjust for multiple comparisons. We set the significance value at 0.05 and 0.10 (marginally significant), so the adjusted significance cut-off is calculated as below:

- First cut-off level: 0.05/12 = 0.004 and 0.1/12 = 0.008 (marginally significant).
- Second cut-off level: 0.05 * (2/12) = 0.008 and 0.016 (marginally significant).

We had two significant results. They were positive treatment effects of treatment 2 on the hourly wage of vacancies viewed and applied for. The p values were 0.02 and 0.03, respectively. Both became non-significant after adjustment.