Gay Varsity: Subject Choices, Grades, and Early Careers for UK LGB University Students

Jefferson Frank, Alexander Vickery

June 2025

Using data on UK students attending university from 2012 – 2020, we look at how LGB students differ from their heterosexual counterparts. LGB men and women both have large shifts towards Humanities subjects, and away from LEM (law, economics, management) and STEM. Gay and bisexual men do well in degree outcomes in the Humanities, and about the same as heterosexual men in other subjects. Lesbian and bisexual women do about the same as heterosexual women in the Humanities and poorly in other subjects. Male and female LGB students suffer in salaries in their early career.

Corresponding author: Jefferson Frank, Royal Holloway, University of London, contact: j.frank@rhul.ac.uk. Other author: Alexander Vickery, Royal Holloway, University of London.

1. Introduction

Two recent papers have used the American Community Survey (ACS), backed up by additional, smaller datasets, to explore the subject choices of sexual minority students at university. Burn & Martell (2020) observe that gay men (compared to other men) are more likely to major in the social sciences and arts, and less likely to major in computer sciences and engineering. Sansone & Carpenter (2020) find that gay males are less likely than heterosexual males to have completed STEM degrees and to work in STEM occupations. Both studies have weaker results for sexual minority women in degree subject choice, but Sansone & Carpenter find that sexual minority women are more likely to work in STEM occupations than are heterosexual women. Hughes (2018) uses a smaller dataset to look at retention rates in STEM subjects during university. Sexual minority males are more likely to switch away from STEM compared to heterosexual males, and sexual minority females are less likely to switch compared to heterosexual females. The articles also provide some hypotheses on causal factors. Burn & Martelll argue that sexual minority men choose lower earning occupations that have non-pecuniary benefits of lower prejudice and more independence. Sansone & Carpenter observe that the participation in subjects by gay men mirrors that of females in general.

In the UK, Armstrong & Sullivan (2024) compare UK Census data (which included sexual orientation and gender identity questions in 2021) with Higher Education Statistics Agency data for the academic year 2021/22. They do this comparison, taking account of age and educational level, but without other explanatory variables. The authors find that LGBT+ students and staff are fully represented in the sector, even in STEM subjects. The current study comes to very different conclusions about LGB students (we don't have staff data), by taking account of explanatory variables such as university entrance examination results and a range of demographic characteristics (such as ethnicity). We are also able to look at performance at university, and first destination jobs and salaries. On this like-for-like basis, the picture is much less sanguine. For example, LGB students are significantly under-represented in STEM.

Diversity in students, including in sexual orientation, across undergraduate subjects is a policy objective in its own right. A student's undergraduate major also impacts upon postgraduate studies and upon career choices. The importance of inclusion is recognized by professional societies. The American Economic Association has established a Committee on the Status of LGBTQ+ Individuals in the Economics Profession specifically 'to provide support for LGBTQI+ economists and economic research rele-

vant to LGBTQ+ populations.' The Royal Economic Society has established a Diversity & Inclusion Network 'to increase participation from under-represented groups and promote a more inclusive culture in the discipline.' Henderson (2015), looking at UK cohort data (of individuals born in 1989/90) finds considerable reported bullying of LGB young adults (52% compared to 38% for heterosexual peers, after controlling for a broad range of variables). If LGB undergraduates are choosing subjects to avoid unfriendly or bullying environments, this is an undesirable situation calling for policy intervention.

In this paper, we use data collected by The Higher Education Statistics Agency (HESA) that cover all students enrolled in universities in the UK. Our total dataset contains over 2 million observations from 2012/13 to 2019/20 graduating cohorts (who would be asked to fill in a first destinations survey about 2 years later). About 45,000 identify as lesbian, gay or bisexual. In addition to sexual orientation, we have demographic data, grades on the university entrance examinations (A-levels), the university and subject of the degree, the degree outcomes and first destinations (including salaries for those in work). Sexual orientation is self-identified in a demographic questionnaire asked by the student's university. We examine LGB students in this study. In future research, we will explore gender identity – the issues involving trans and non-binary students are complex and different from those of sexual orientation.

Throughout, we refer to LGB men and LGB women, using this slightly awkward terminology since we don't try – within gender – to distinguish forms of sexual minority. Our sample size (although large) was not sufficient to allow us both to control for the full set of variables and also distinguish between, for example, gay and bisexual men. We therefore use the term LGB men to refer to all male students declaring a sexual minority orientation, and LGB women to refer to all sexual minority female students. When we come to explanations for some of the observed phenomena, this aggregation may be having a differential impact by gender, since a much larger percentage of LGB women are bisexual. We discuss this further after presenting our results.

We use a matching technology [see Ñopo (2008)] to address some of the econometric issues described by Walker & Zhu (2011, 2018), whose work on the earnings of UK university students in general guides our analysis, although their data (the Labour Force Survey) samples the UK Labour Force as a whole (and not just university students) and they use an Inverse Probability Weighted Regression Adjustment methodology. Since we have a small target population embedded in a large overall population, it is easy to find exact matches rather than relying upon propensity scores. We also use some of the approaches in Britton et al. (2022b) that examine the LEO (Longitudinal Education

Outcomes) data on school, university and tax records to look at returns to degrees. LEO has not to date been linked to the Census or other UK data that contain sexual orientation information.

The quality of the data and the sample size allow us to get surprisingly definitive results compared to the existing literature. We ask whether an LGB male or female student differs from a heterosexual of the same gender in terms of what subject of degree they choose, what university they go to, what grades they get at the university on their chosen subject, and what happens after university. In looking at these issues, we can control for ethnicity, social class, overall university entrance examination grades and other demographics. In the UK, a student applies for a specific subject at a university, so makes the decision of subject and university together at approximately age 18.

Dividing subjects into the categories STEM, LEM (law, economics and management) and HUM (humanities and other subjects), we find that LGB men and LGB women have very similar large and significant shifts away from STEM and LEM into HUM, compared to heterosexual men and women. In the raw data (and robust to controls), 42% of LGB men do HUM degrees compared to 31% of heterosexual men; 54% of LGB women do HUM degrees compared to 44% of heterosexual women. LGB men (women) are 4% (4%) less likely to do LEM subjects and 6% (7%) less likely to do STEM, compared to heterosexuals of the same gender. This commonality between LGB men and women, in terms of subject shifts, is surprising compared to the existing literature which has tended to show very different results (notably, in the labour market) for gay men and lesbians [see Badgett, Carpenter, and Sansone (2021)].

UK degrees are graded into distinct classifications. Over the sample as a whole, roughly 30% obtain the top category, first class degrees; about half obtain upper-second; 10% lower-second; and the residual is scattered over thirds, unclassified and other weak results. LGB men do well in the HUM subjects, obtaining significantly more firsts than heterosexual men, with no significant difference in performance in the other subjects. LGB women have a much less favourable set of outcomes – their results in HUM subjects are mixed, and they do significantly worse than heterosexual women in LEM and STEM. These results are consistent with the study by Mittleman (2022) on high school students in the US.

Looking at first destinations after university, the results on LGB men and women converge again. Controlling for degree subject, degree grades and the full set of demographics, LGB men and women earn significantly less than their heterosexual counterparts. At this early stage of their career, the differential is about £1000 - £1500 a year, or

about 6% of average salaries. This is consistent with recent analyses by Sarzosa (2023) on negative selection into labour market outcomes. Since both LGB men and women tend to choose less well-paid subjects, and LGB women do less well on average in university, the overall effect is even greater. Since the individual's degree outcome at university is a measure of productivity (albeit not directly in their employment), the earnings differential that remains might be a good measure of disadvantage due to sexuality.

Since the seminal work by Badgett (1995), studies have shown very different experiences of LGB men and LGB women in the labour market. LGB men have tended to do worse, and LGB women better, than heterosexuals of the same gender. Here the effects across gender are largely comparable, except that LGB women do badly in their degree outcomes, and seem to suffer a modestly smaller negative salary effect. It is noted that we are discussing individuals in their early adulthood, whose attitudes and experiences may be very different from both the past and from what ensues over time in their own lives. Nonetheless, while both positive (pull towards the HUM subjects) and negative (push away from LEM and STEM) factors may be in play in degree choice, it's troubling that LGB women have negative degree results and both LGB men and women have overall negative earnings compared to heterosexuals of the same gender.

2. The Data and Methodology

The American Community Survey used in the recent related US studies is an annually reported survey that is amalgamated into 5-year blocks. Burn & Martell (2020) use the 2011 – 2015 data of about 4,000,000 individuals over 25, using same-sex cohabitation to infer sexual orientation. They identify about 60,000 gay men and lesbians. Sansone & Carpenter (2020) use the 2009 – 2018 data with over 142,000 cohabiting gay men and lesbians. The ACS is intended to be representative of the population, since it is drawn at random and those contacted are required to respond.

Our administrative/survey data are very different from the ACS. We have, for each cohort of university students in England from 2012 onwards, a full sample of students that enrol in university and in due course answer the final destinations survey (about half of students in total).[1] The data include information about the university attended and the results obtained by students in their university entry examinations (A-levels) and in their university degrees, as well as a range of demographic information (including

[1]The first destinations survey is either (during 2012/13 – 2016/17) the Destination of Leavers from Higher Education survey or (from 2017/18 onwards) the Graduate Outcomes survey.

ethnicity and social class). In the UK, students are admitted to a specific subject course at a university, and cannot readily change their subject. Our full sample contains over 2 million observations from 2012/13 to 2019/20 graduating cohorts.

Starting from 2012, universities asked students about their sexual orientation when they first arrived, and universities decided whether or not to report this information to the central authorities. For the 2012/13 cohort, sexual orientation was reported for only 16.31% of the sample. By the 2019/20 cohort, sexual orientation was reported for 76.29%. We check for stability of our results by looking at the last two cohorts, and find that the results are similar to the full sample period. About 45,000 individuals in total identify as lesbian, gay or bisexual. The 2-3% identifying in this way is consistent with other large samples, such as the UK Census. The Office for National Statistics reports that 1.54% of the over-16 population identified as gay or lesbian and 1.28% as bisexual.

Self-identification has advantages and disadvantages. Within the literature, it is recognised that inferring sexuality from co-habitation presents a restricted sample, and provides different results than using self-identification. Aksoy et al. (2019) for example find that earnings disadvantages (advantages) exist for partnered gay men (lesbians) compared to partnered heterosexual men (women), but not between non-partnered gay men (lesbians) and non-partnered heterosexual men (women). The current data have the further advantage that the students identify contemporaneously to their university attendance. The response is therefore coincident with the choice of subject, performance and first destinations. Some data sources such as the birth cohort studies in the UK ask about sexuality at different times in the life cycle, as does the UK census.[2] The primary shortcoming of self-identification data is that individuals may not answer the question or may answer incorrectly, either because of unfamiliarity with the terminology or because they do not want to acknowledge their actual sexuality. Further, it is possible that the willingness to reveal one's sexuality is correlated with other variables. An important example in this study is that there may be more self-identified sexual minorities in the Humanities subjects simply because students in those subjects feel freer to reveal their identity or indeed to adopt a more bohemian identity. We cannot rule out this possibility even in an anonymous survey.

Our raw data without sample restrictions contains 845,758 males and 1,156,434 females. Removing students with missing A-level results (fewer than 3 A-levels reported) cuts this roughly in half, and removing those with missing demographic information

[2] see https://www.ucl.ac.uk/ioe/departments-and-centres/centres/centre-longitudinal-studies. One of the cohorts is the NCDS discussed below.

leaves us with 333,750 males and 440,253 females. Our preferred measure of LGB male is for those students who choose bisexual, gay or 'other'; for LGB female, it is for those students who choose bisexual, lesbian or 'other'. This definition gives us 8136 LGB men and 10,977 LGB women. The category 'other' includes for example 'queer'. Our sample is not large enough to allow for distinguishing between these responses.

Table 1 compares (by gender) LGB and H (heterosexual) students in the raw data. LGB students are not from the upper socioeconomic status (SES) and are more likely to have attended state school. They tend to be white, and are more likely to report a disability. They are more likely to attend elite universities (Oxford, Cambridge, Imperial or the LSE). Students choose subjects at two stages. At age 16, they typically study for 3 A-level examinations, ranging from Mathematics to Sociology. LGB males and females are less likely to study LEM and STEM A-level subjects, and more likely to study HUM A-levels. The choice of A-levels determines the potential choice of university subject, where again LGB males and females favour HUM courses. As an example, A-level mathematics is required for Economics degrees at many but not all universities. 'Tariff points' is a single number that amalgamates the grades received on the student's A-levels. LGB men and women do better at A-levels than their heterosexual counterparts. In the raw data, they nonetheless get lower salaries in their first jobs.

[Table 1: about here]

The bulk of the literature looking at university students in the UK in general (without using any sexual orientation information) concerns the earnings following on from various degree subjects. An early study by Blundell et al. (2000) using the UK National Child Development Survey (NCDS) panel of individuals born in 1958 finds high returns to undertaking a university degree for both men and women, even after controlling for grades on A-levels and the earlier age (typically, 15 or 16) GCSE examinations. Like the current study, they use a matching technology. Walker & Zhu (2011) use UK Labour Force Survey (LFS) data to take account of both degree subject and degree classification (grades obtained). The study finds a strong return to getting a 'good degree' (first or upper-second), and for men high returns to 'law/economics/management' degrees. In their later paper 2018, they add information on the university where the degree was obtained. Since Walker & Zhu are not considering binary treatments, they cannot use matching technologies for estimation, as we do in this paper. As an alternative, they use Inverse Probability Weighted Regression Adjusted estimations. We use Walker & Zhu as a guide in amalgamating subjects and in other definitions, in order to maintain

comparability. Britton et al. (2022a) look at the earnings returns to different subjects and universities, while Britton et al. (2022b) look at the private financial returns to getting 'good grades'. They find that getting a top-class degree (and also avoiding particularly low grades) has a big return, but one that differs by subject and university.

In any case, financial returns are only part of the story as to why a student chooses one subject over another. Codiroli Mcmaster (2017) looks at the choice of STEM subjects with the Next Steps dataset, another of the cohort longitudinal panel studies (birth dates 1988/89). The data include just over 4000 students who had taken A-levels.[3] Codiroli Mcmaster is able to find effects by gender and ethnicity, after controlling for socioeconomic factors (including parents' education, which has a significant effect). Non-white students are generally less likely to study the Arts & Humanities, while female students are more likely to study those subjects.

We use an exact matching technology for our econometric work, guided by papers from Abadie & Imbens (2006, 2011, 2016). Because of the relatively small proportion of our sample that is our target (LGB men and women), we are largely able to find exact matches without too much of a deterioration in our sample size. We therefore do not rely on propensity matching. For our reported results, we use matching without replacement and the coding provided in Greifer & Stuart (2021).

3. Degree Subject Choice

There are a very large number of different A-level examination subject choices, and a very large number of different university degree subjects and variants. We do not try to explain A-level subject choices, which are taken as pre-determined for this study. It turns out that the choices of subjects at age 16 are related to the university subject choice (as would be expected, particularly since some A-level subjects are prerequisites for some university courses), but are not fully determinative. We find that there remain significant differences between LGB and heterosexual students in the age 18 choice of university subject after allowing for the subject of the A-level with the highest grade. We would lose too much of the sample if we tried to match exactly on all 3 A-levels.

HESA (Higher Education Statistical Agency) implemented in 2019/20 a Common Aggregation Hierarchy (CAH) that allows us to map a given degree subject (for example, Economics and Mathematics) into a broader grouping. We classify subjects by version

[3] Although Next Steps has data on sexual orientation, the sample size is too small to look at subject choice.

1.3.4, that aggregates to 21 CAH subject codes, although we then combine 'medicine, dentistry and veterinary' into one category, and 'agriculture, architecture and general studies' into one category, in order to have workable sample sizes. The subjects are abbreviated on the axis of Figure 1 and shown in full in the notes to the Figure.

Figure 1 shows the choice of subjects in the raw data. The ordering of the subjects in Figure 1 is based upon Britton et al. (2022a), with the highest earning subjects to the right of the Figure. For each subject, there are two hieroglyphs – the left hand one shows the difference between LGB and H men in the raw data, and the right hand one shows the difference between LGB and H women. The Figure suggests a downward-sloping regression line between sexual minorities in the subject and the subject's average earnings. Some subjects (such as 'allied to medicine' and 'nursing') show a particular disparity for LGB women – but this is largely due to the gendered nature of those subjects. There are many more heterosexual women than men in nursing. In the same way, LGB men show a high lack of representation in 'engineering'. Close to home, it is noteworthy that LGB women but not LGB men avoid 'economics', relative to the gendered participation of heterosexuals in our subject.

[Figure 1: about here]

While we can look at this level of subject disaggregation in the raw data, we need to move to the groupings of STEM, LEM and HUM subjects for our estimations. In Figure 1, we have shown how the individual subjects map into these categories – the hieroglyphs have a circle for HUM, a square for STEM and a diamond for LEM.

Table 2 shows subject group choices of LGB males and females compared to heterosexuals of the same gender. The first column is the full sample and shows a remarkable similarity between LGB males and females (compared to heterosexuals of the same gender) – each is more than 10 percentage points more likely to do HUM subjects than their heterosexual counterparts. Of LGB males (returning to Table 1), 42% do HUM subjects compared to 31% of heterosexual males. Of LGB females, 54% do HUM subjects compared to 44% of heterosexual females.

[Table 2: about here]

Column 2 of Table 2 controls for the demographic variables in our sample. As expected, this lowers the (absolute value of the) raw data coefficients, but by a modest amount. LGB men and women continue to do disproportionately more HUM degrees, and (again by surprisingly similar amounts) fewer LEM and STEM subjects. Putting

in tariff points – how well students did on their university entry A-level examinations – has little effect. The subject of the student's best A-level does noticeably lower the magnitude of the subject choice coefficients. This is to be expected since the choices students make at age 16 on which university entry subjects to study from 16 – 18 will impact on their university subject choice. Students choose, for example, to do English or Maths at A-level, maintaining channels into HUM and STEM subjects. Returning to the raw data in Table 1, LGB men and women are more likely to do HUM A-levels, and less likely to do LEM and STEM. Our results suggest that this decision at 16 is not fully determinative. At 18 – after visiting university departments and meeting with current students, as well as other input into their final decisions – LGB students tilt even further towards HUM subjects. The caveat on this is that we control in column 4 only for the subject of the best A-level result for the student. This alone causes our sample to decline to about 70% of the original sample. Trying to control for all 3 A-level subjects led to too large a decline in the sample, and is not reported.

4. Degree Results

LGB students might be signing up for humanities courses out of enthusiasm. As part of their identity, they may value literature and the arts, or social sciences such as sociology to better understand how they fit into society as a minority. If that is the explanation for the subject differentials, LGB students should do well on their degrees. LGB students remaining in STEM or LEM subjects do so because they have a particular aptitude and affinity to the scientific subject. Consequently, the unobserved heterogeneity should favour LGB students in those subjects, and they should out-perform. While the mix of LGB students in HUM, correspondingly, will include those with less inherent aptitude or affinity, the 'pull' enthusiasm may at least in part counter-balance that effect.

An alternative hypothesis is one of 'push'. The evidence is that bullying of high school students in general, and particularly LGBT students remains at significant levels [Jadva et al. (2023)]. If LGB students avoid LEM and STEM subjects because of a hostile environment, the remaining sexual minority students in those subjects might do badly due to bullying or discrimination. This may be the case even though they have been selected as the ones with the greatest ability and affinity in the subjects who choose to try to withstand the unwelcoming environment.

A feature of the UK system is that the bulk of the degree classification is based upon anonymous, unseen in advance, written examinations. With the exception of

allowances (such as time) for special needs, all students face a level playing field. This anonymity is intended to limit discrimination which might arise if student names were on the examination script. It is therefore likely that any negative effects on a defined group of students arise during the actual education process. Sexual minority students might be coping with bullying or other forms of a negative learning environment.

Table 3 looks at degree classifications for LGB men and LGB women (compared to heterosexuals of the same gender). The first column is from the raw data, with controls then added (column 2) for demographics, (column 3) for average entrance exam grades 'tariff points', (column 4) for the actual disaggregated degree subject, and (column 5) for the university. It is seen that the results are robust to the addition of all these controls, even as the sample size diminishes. It is only in the final column, when we seek to match students on specific subject courses in the same university, that the sample size falls dramatically.

[Table 3: about here]

LGB men do well on HUM degrees, gaining more first-class degrees where their heterosexual counterparts are instead getting upper and lower seconds. On LEM and STEM, there is no discernible pattern. This is consistent with the 'pull' model described above.

LGB women have a mixed pattern on HUM degrees. In the raw data, they gain more first-class degrees than their heterosexual counterparts, and fewer upper second degrees. However, this is not robust to even the baseline demographic controls. Further, there is some indication that LGB women gain more lower (rather than upper) second degrees, suggesting weaker performance among some LGB women even in HUM subjects. But the picture in LEM and STEM is entirely negative – LGB women get fewer top degrees and more weak degrees. This is consistent with the 'push' hypotheses, that sexual minority women face stresses in their educational programme, whatever the subject.

We raised in the introduction the possibility that students might be more likely to declare their minority sexuality in more benign environments, such as the HUM subjects. It may be the case that LGB students are represented in the same proportions across subjects as their heterosexual counterparts. However, LGB students in the HUM subjects may be more likely to declare their sexuality. If we make the further assumption that the best, most confident LGB students declare their sexuality in the confidential surveys, this means that the declared LGB students will be 'better' students than the

underlying LGB population in the same subjects. This is an alternative, selection (rather than actual productivity) explanation for why LGB males in the HUM subjects do better than their heterosexual counterparts. It does not explain the negative degree results for LGB females in LEM and STEM.

A factor that may be affecting the less favourable degree performance by LGB women (compared to heterosexual women) is the high proportion of bisexuals. Gay men represent 2.67% of the male population in our sample, and bisexual men 1.29%. Lesbians represent 0.86% of the female population, and bisexual women 2.98%. UK studies including Aksoy, Carpenter, and Frank (2018) and US studies such as Mize (2016) show that bisexuals do poorly in the labour market. Mize argues that bisexuals may suffer from higher discrimination since their sexuality may be viewed as by choice and also reflect a general uncertainty in behaviour. As data from future cohorts become available in the next few years, the sample size may allow for more precise estimates within the sexual minorities. Further, there is evidence that the number of students declaring LGBT+ identities is rising – the latest summary statistics show that 8.5% of 2020 entrants identify in this way.

5. Employment outcomes

We have seen that LGB men and women choose different subjects than heterosexuals of the same gender. Both LGB men and women have similar shifts in favour of the Humanities at the expense of LEM and STEM subjects. LGB men do better than their heterosexual male counterparts in terms of degree success in the Humanities, and about the same in LEM and STEM. LGB women do about the same or a bit worse than heterosexual women in the Humanities, and considerably worse in LEM and STEM.

What happens when LGB students graduate? Table 4 looks at first destinations, information covering the 18 months after completing the degree. We see that LGB men and women both are less likely to end up in full-time employment than heterosexual comparators in the raw data (first column). With the full controls, including the subject and university name, LGB men are no longer significantly less likely to go into full-time employment than heterosexual men, but remain more likely to go into full-time study. Even with the full controls, LGB women are less likely to be in full-time employment and more likely to go into part-time employment, work and study and unemployment than heterosexual women.

Table 4 also reports average salaries for those individuals who are in full-time work.

In the raw data, LGB men earn £1,494 less on average than H men and LGB women £1,270 on average less than H women. These statistically significant differences represent about a 6% gap for each gender (given that there remains a gender pay gap in the population). As would be expected, since LGB men and women do less lucrative subjects at university, controlling for subject (in column 4) lowers the measured salary gap by up to 50%. Adding the university name severely lowers sample size, and the modestly smaller LGB male salary gap becomes insignificant due to a substantial increase in the standard error. Even with the university name, LGB women earn significantly less than H women.

[Table 4: about here]

These negative labour market effects – which interestingly are in contrast to much of the literature based on the whole population, not just recent graduates – suggest that discrimination or other adverse effects may be occurring. Alternatively, even within a degree subject, LGB graduates may be choosing less remunerative employment. This could be because their identity emphasises other values, or because they are choosing work environments that might be less hostile than others. For example, economics graduates may choose to work in the public or voluntary sectors, rather than in finance.

6. Conclusions

Sexual identity is about more than preferences for one gender or another as a romantic partner. It is about an identity, and it is not surprising that it would be associated with different interests in different academic subjects. Further, a self-reinforcing equilibrium might eventuate – LGB students do the Humanities precisely because there are more LGB students in the Humanities with whom to interact. Similarly, there may be fewer openly-LGB teachers in LEM and STEM subjects, perpetuating the equilibrium. A recent study (Hanson & Quintero (2018)) looks at how a lack of diversity among teachers might have negative impacts upon students of that demographic.

We were surprised that LGB men and LGB women showed a similar pattern in subject choice, both showing almost identical shifts towards the Humanities and away from LEM and STEM. This suggests that a common LGB identity outweighs gender differentials. But the two genders of LGB students differ when it comes to degree outcomes. LGB men have outcomes consistent with a 'pull' model where the welcoming environment in the Humanities leads them to get better results. It is hard to interpret the negative outcomes for LGB women in LEM and STEM, and no clear positive outcomes in HUM, in a positive

or even neutral way. These outcomes are consistent with a model where LGB women in particular are subject to environmental factors that impede their studies.

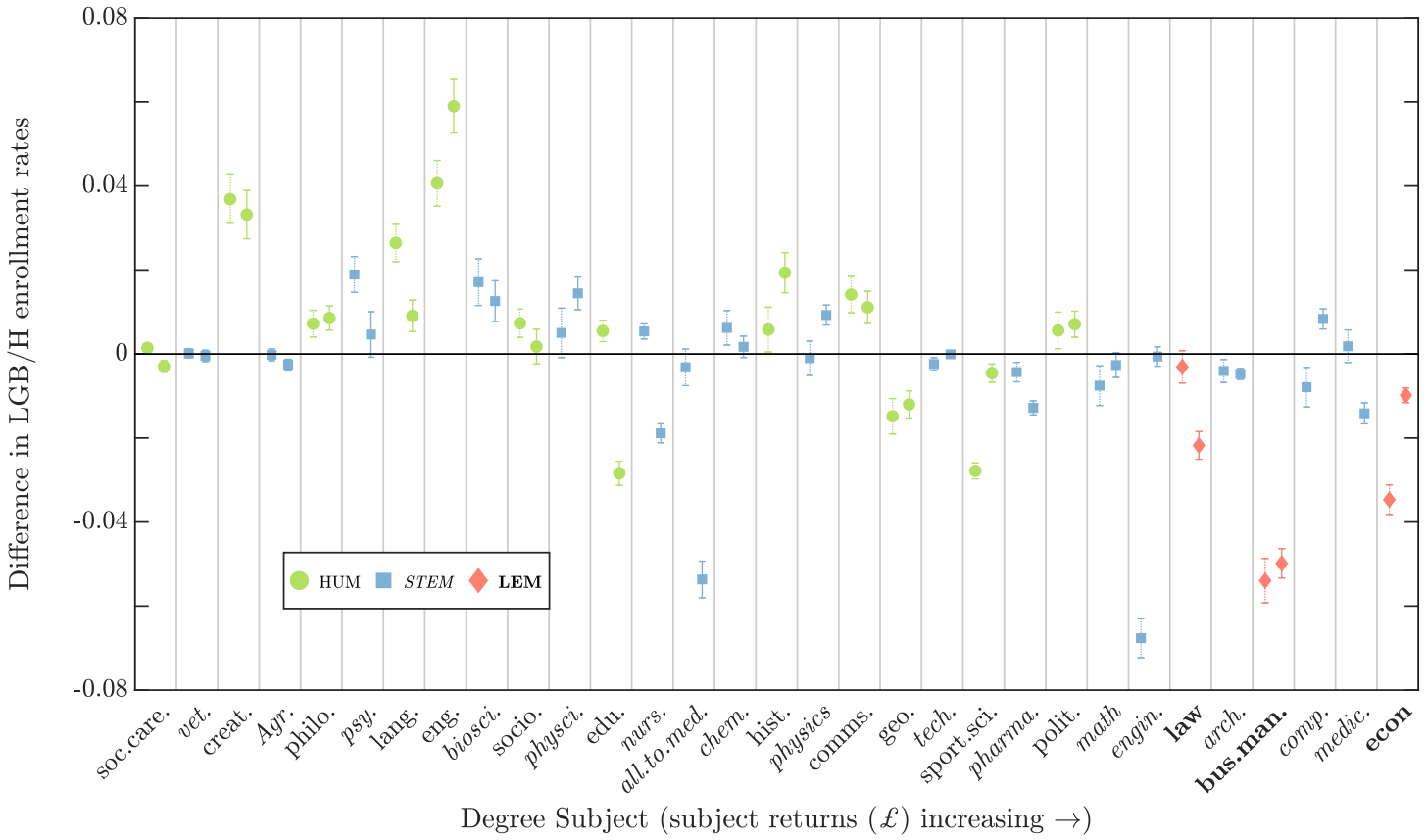
This negativity is reinforced by the first destinations data. LGB students of both sorts are less likely to enter full-time work in the 18 months after graduation. Of those who do, their average salary is less than their H counterparts. While this could reflect a taste for less remunerative – and more rewarding in other ways – jobs, it could also be a product of discrimination. It is interesting that similar results hold for both LGB men and women, in contrast to much of the literature on LGB individuals as a whole in the workforce. It may be that LGB pay gaps (typically negative for men and positive for women) develop later in the career, perhaps as an absence of marriage becomes a signal for LGB sexuality among men (and leads to discrimination) and LGB women have fewer children than H women.

Table 1. Sample descriptive statistics

	Male Sample			*Female Sample*		
	(1) LGB	(2) H	(3) Difference	(4) LGB	(5) H	(6) Difference
a) Demographic characteristics						
Age upon entry	18.40 (0.60)	18.39 (0.59)	0.01** (0.01)	18.43 (0.61)	18.38 (0.58)	0.05*** (0.01)
Is from upper SES	0.295 (0.46)	0.334 (0.47)	-0.04*** (0.01)	0.308 (0.46)	0.297 (0.46)	0.01 (0.01)
Is from middle SES	0.487 (0.50)	0.494 (0.50)	-0.01 (0.01)	0.497 (0.50)	0.501 (0.50)	-0.00 (0.01)
Asian ethnicity	0.048 (0.21)	0.119 (0.32)	-0.07*** (0.01)	0.041 (0.20)	0.108 (0.31)	-0.07*** (0.01)
Black ethnicity	0.011 (0.10)	0.031 (0.17)	-0.02* (0.01)	0.016 (0.13)	0.042 (0.20)	-0.03*** (0.01)
White ethnicity	0.895 (0.31)	0.804 (0.40)	0.09*** (0.00)	0.886 (0.32)	0.803 (0.40)	0.08*** (0.00)
Has a known disability	0.200 (0.40)	0.114 (0.32)	0.09*** (0.01)	0.316 (0.46)	0.131 (0.34)	0.18*** (0.01)
Attended state school	0.882 (0.32)	0.836 (0.37)	0.05*** (0.00)	0.894 (0.31)	0.879 (0.33)	0.01*** (0.00)
b) Qualifcations upon entry to university						
LEM A-level(s)	0.166 (0.37)	0.289 (0.45)	-0.12*** (0.01)	0.095 (0.29)	0.180 (0.38)	-0.09*** (0.01)
STEM A-level(s)	0.667 (0.47)	0.750 (0.43)	-0.08*** (0.01)	0.621 (0.49)	0.657 (0.47)	-0.04*** (0.01)
HUM A-level(s)	0.688 (0.46)	0.597 (0.49)	0.09*** (0.01)	0.813 (0.39)	0.793 (0.41)	0.02*** (0.00)
Tariff points	133.4 (40.30)	128.1 (38.35)	5.26*** (0.46)	128.0 (35.00)	126.5 (33.92)	1.49*** (0.34)
c) Degree subject choice						
LEM degree	0.110 (0.31)	0.202 (0.40)	-0.09*** (0.01)	0.068 (0.25)	0.150 (0.36)	-0.08*** (0.01)
STEM degree	0.410 (0.49)	0.460 (0.50)	-0.05*** (0.01)	0.335 (0.47)	0.374 (0.48)	-0.04*** (0.01)
HUM degree	0.423 (0.49)	0.314 (0.46)	0.11*** (0.01)	0.544 (0.50)	0.443 (0.50)	0.10*** (0.01)
d) Type of university attended						
Elite Russell group	0.057 (0.23)	0.036 (0.19)	0.02* (0.01)	0.035 (0.18)	0.019 (0.14)	0.02* (0.01)
Russell group	0.402 (0.49)	0.391 (0.49)	0.01 (0.01)	0.354 (0.48)	0.363 (0.48)	-0.01 (0.01)
'Old'	0.171 (0.38)	0.205 (0.40)	-0.03*** (0.01)	0.186 (0.39)	0.164 (0.37)	0.02** (0.01)
Other selective	0.173 (0.38)	0.154 (0.36)	0.02* (0.01)	0.194 (0.40)	0.188 (0.39)	0.01 (0.01)
Other	0.197 (0.40)	0.214 (0.41)	-0.02* (0.01)	0.230 (0.42)	0.265 (0.44)	-0.03*** (0.01)
e) Degree classification						
First-class	0.332 (0.47)	0.311 (0.46)	0.02** (0.01)	0.320 (0.47)	0.319 (0.47)	0.00 (0.01)
Upper second-class	0.491 (0.50)	0.501 (0.50)	-0.01 (0.01)	0.531 (0.50)	0.537 (0.50)	-0.01 (0.01)
Lower second-class	0.123 (0.33)	0.135 (0.34)	-0.01 (0.01)	0.115 (0.32)	0.099 (0.30)	0.02* (0.01)
Third-class	0.017 (0.13)	0.017 (0.13)	-0.00 (0.01)	0.012 (0.11)	0.008 (0.09)	0.00 (0.01)
e) Post-graduation						
Full-time employment	0.520 (0.50)	0.566 (0.50)	-0.05*** (0.01)	0.480 (0.50)	0.582 (0.49)	-0.10*** (0.01)
Part-time employment	0.110 (0.31)	0.095 (0.29)	0.01 (0.01)	0.148 (0.35)	0.102 (0.30)	0.05*** (0.01)
Work & study	0.083 (0.28)	0.072 (0.26)	0.01 (0.01)	0.100 (0.30)	0.080 (0.27)	0.02** (0.01)
Full-time study	0.162 (0.37)	0.142 (0.35)	0.02** (0.01)	0.138 (0.35)	0.135 (0.34)	0.00 (0.01)
Unemployed	0.054 (0.23)	0.054 (0.23)	0.00 (0.01)	0.054 (0.23)	0.033 (0.18)	0.02** (0.01)
Salary (£)	21,656 (7,084)	23,150 (7,597)	-1,494.2*** (194.2)	19,498 (5,616)	20,768 (5,694)	-1269.9*** (149.4)
N	8,136	131,534	-	10,977	180,920	-

Notes: All data are provided by JISC/HESA as extremely sensitive secure data. This is available to eligible qualified researchers on application and fees paid to JISC, and subject to conditions imposed by JISC/HESA. LGB refers to respondents who answer the self-identification sexual orientation question as 'lesbian, gay, bisexual, other' and heterosexual in the remaining categories. The table shows subjects divided across categories. The division into LEM, STEM, HUM follows the existing literature. In this Table, there is a fourth, non-reported category, primarily the performing arts. In the estimations, we amalgamate this with the Humanities. The variable 'tariff points' uses the official calculator for translating letter grades on A-levels. *** shows significance at the 1% level, ** at the 5% level, and * at the 10% level.

FIGURE 1. Difference in LGB/H subject enrollment rates by subject returns (£)



Notes: All data are provided by JISC/HESA as extremely sensitive secure data. This is available to eligible qualified researchers on application and fees paid to JISC, and subject to conditions imposed by JISC/HESA. LGB refers to respondents who answer the self-identification sexual orientation question as 'lesbian, gay, bisexual, other' and heterosexual in the remaining categories. The table shows subjects divided across categories. The division into LEM, STEM, HUM follows the existing literature. The subjects abbreviated are: Social care, Veterinary Science, Creative Arts, Agriculture, Philosophy, Psychology, Languages, English, Biosciences, Sociology, Physical Sciences, Education, Nursing, Allied to Medicine, Chemistry, History, Physics, Communications, Geography, Technology, Sports Science, Pharmacology, Politics, Maths, Engineering. 95% confidence intervals are shown by error bars around each plotted point.

TABLE 2. Difference in LGB/H subject enrollment rates

	(1)	(2)	(3)	(4)
a) Male sample				
LEM subjects	-0.092***	-0.072***	-0.085***	-0.043***
	(0.004)	(0.006)	(0.006)	(0.006)
STEM subjects	-0.050***	-0.041***	-0.043***	-0.003
	(0.006)	(0.008)	(0.008)	(0.007)
HUM subjects	0.142***	0.113***	0.129***	0.049***
	(0.006)	(0.008)	(0.008)	(0.008)
LGB sample *N*	8,136	8,124	7,791	5,516
LGB sample %	100	99.85	95.76	67.80
b) Female sample				
LEM subjects	-0.081***	-0.078***	-0.065***	-0.045***
	(0.004)	(0.006)	(0.006)	(0.006)
STEM subjects	-0.039***	-0.029***	-0.044***	-0.020***
	(0.006)	(0.008)	(0.008)	(0.007)
HUM subjects	0.121***	0.107***	0.109***	0.066***
	(0.006)	(0.008)	(0.008)	(0.008)
LGB sample *N*	10,977	10,958	10,584	7,982
LGB sample %	100	99.83	96.42	72.72
c) Variables used for matching				
baseline controls	N	Y	Y	Y
tariff points	N	N	Y	Y
best A-lvl subj.	N	N	N	Y

Notes: All data are provided by JISC/HESA as extremely sensitive secure data. This is available to eligible qualified researchers on application and fees paid to JISC, and subject to conditions imposed by JISC/HESA. LGB refers to respondents who answer the self-identification sexual orientation question as 'lesbian, gay, bisexual, other' and heterosexual in the remaining categories. The table shows subjects divided across categories. The division into LEM, STEM, HUM follows the existing literature. Variables in 'baseline controls' are the demographics in Table 1: age, social class, ethnicity, disability, state school. The variable 'tariff points' uses the official calculator for translating letter grades on A-levels. The 'best A-level subject' is the actual subject from the 21 CAH (Common Aggregation Hierarchy) codes, as is 'degree subject'. *** shows significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 3. Difference in LGB/H degree classification rates

	Male sample					Female sample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
a) LEM subjects										
First-class	0.007	-0.021	-0.009	0.025	0.055	-0.067***	-0.107***	-0.133***	-0.070**	-0.106**
	(0.016)	(0.020)	(0.020)	(0.025)	(0.043)	(0.017)	(0.021)	(0.022)	(0.028)	(0.048)
Upper second-class	-0.003	0.009	-0.000	-0.004	-0.014	0.018	0.045**	0.066***	-0.014	0.037
	(0.017)	(0.021)	(0.021)	(0.027)	(0.048)	(0.018)	(0.022)	(0.023)	(0.030)	(0.051)
Lower second-class	0.003	0.017	0.011	-0.004	-0.023	0.045***	0.056***	0.063***	0.082***	0.074**
	(0.012)	(0.014)	(0.014)	(0.018)	(0.033)	(0.013)	(0.015)	(0.015)	(0.018)	(0.035)
b) STEM subjects										
First-class	-0.008	-0.016	-0.044***	-0.024*	-0.043*	-0.023***	-0.045***	-0.066***	-0.075***	-0.058**
	(0.009)	(0.012)	(0.012)	(0.014)	(0.026)	(0.008)	(0.011)	(0.011)	(0.013)	(0.024)
Upper second-class	-0.010	-0.014	0.014	-0.001	-0.007	0.025***	0.037***	0.059***	0.032**	0.022
	(0.009)	(0.012)	(0.012)	(0.015)	(0.026)	(0.008)	(0.011)	(0.012)	(0.014)	(0.025)
Lower second-class	0.003	0.006	0.012	0.017*	0.050***	0.024***	0.027***	0.032***	0.036***	0.023
	(0.006)	(0.008)	(0.008)	(0.010)	(0.019)	(0.006)	(0.007)	(0.007)	(0.008)	(0.014)
c) HUM subjects										
First-class	0.071***	0.065***	0.041***	0.033***	0.056**	0.034***	-0.001	-0.006	0.004	0.009
	(0.008)	(0.011)	(0.011)	(0.013)	(0.027)	(0.006)	(0.008)	(0.009)	(0.009)	(0.016)
Upper second-class	-0.040***	-0.043***	-0.021*	-0.025*	-0.043	-0.045***	-0.016*	-0.007	-0.032***	-0.033*
	(0.008)	(0.012)	(0.012)	(0.014)	(0.029)	(0.006)	(0.009)	(0.009)	(0.010)	(0.017)
Lower second-class	-0.029***	-0.021***	-0.021**	-0.009	-0.011	0.007*	0.014**	0.009	0.023***	0.021**
	(0.005)	(0.008)	(0.008)	(0.009)	(0.019)	(0.004)	(0.005)	(0.006)	(0.006)	(0.010)
d) Variables used for matching & size of the matched sample										
baseline controls	N	Y	Y	Y	Y	N	Y	Y	Y	Y
tariff points	N	N	Y	Y	Y	N	N	Y	Y	Y
degree subject	N	N	N	Y	Y	N	N	N	Y	Y
name of university	N	N	N	N	Y	N	N	N	N	Y
LGB sample *N*	8,136	8,124	7,791	5,572	1,472	10,977	10,958	10,584	8,130	2,457
LGB sample %	100	99.85	95.76	68.49	18.09	100.00	99.83	96.42	74.06	22.38

Notes: All data are provided by JISC/HESA as extremely sensitive secure data. This is available to eligible qualified researchers on application and fees paid to JISC, and subject to conditions imposed by JISC/HESA. LGB refers to respondents who answer the self-identification sexual orientation question as 'lesbian, gay, bisexual, other' and heterosexual in the remaining categories. The table shows subjects divided across categories. The division into LEM, STEM, HUM follows the existing literature. Variables in 'baseline controls' are the demographics in Table 1: age, social class, ethnicity, disability, state school. The variable 'tariff points' uses the official calculator for translating letter grades on A-levels. The variables 'name of university' and 'degree subject' are the actual university and the name of the degree subject studied. *** shows significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 4. Difference in LGB/H post-graduation outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
a) Male sample							
Full-time employment	-0.046***	-0.043***	-0.044***	-0.015	-0.029	-0.007	-0.061***
	(0.006)	(0.008)	(0.008)	(0.009)	(0.018)	(0.012)	(0.023)
Part-time employment	0.015***	0.011**	0.012**	-0.006	-0.008	-0.013*	-0.010
	(0.004)	(0.005)	(0.005)	(0.006)	(0.010)	(0.007)	(0.014)
Work & study	0.011***	0.009**	0.002	0.006	0.007	0.016**	0.018
	(0.003)	(0.004)	(0.004)	(0.005)	(0.010)	(0.006)	(0.013)
Full-time study	0.021***	0.022***	0.026***	0.025***	0.037***	0.005	0.056***
	(0.004)	(0.006)	(0.006)	(0.006)	(0.013)	(0.009)	(0.016)
Unemployed	0.000	-0.001	0.005	-0.005	-0.004	-0.002	-0.016*
	(0.003)	(0.004)	(0.004)	(0.004)	(0.007)	(0.005)	(0.009)
Salary (£)	-1,494.2***	-1467.2***	-1,377.2***	-915.2***	-681.4	-449.3	-505.7
	(194.2)	(277.6)	(274.0)	(345.8)	(591.1)	(416.6)	(767.0)
LGB sample *N*	8,136	8,124	7,791	5,572	1,472	3,277	824
LGB sample %	100	99.85	95.76	68.49	18.09	40.28	10.13
b) Female sample							
Full-time employment	-0.102***	-0.106***	-0.108***	-0.077***	-0.065***	-0.059***	-0.074***
	(0.005)	(0.007)	(0.007)	(0.008)	(0.014)	(0.010)	(0.017)
Part-time employment	0.046***	0.041***	0.047***	0.033***	0.032***	0.020***	0.022*
	(0.003)	(0.004)	(0.004)	(0.005)	(0.009)	(0.007)	(0.011)
Work & study	0.020***	0.015***	0.015***	0.017***	0.021***	0.017***	0.031***
	(0.003)	(0.004)	(0.004)	(0.005)	(0.008)	(0.006)	(0.010)
Full-time study	0.004	0.012***	0.010**	-0.001	-0.005	-0.004	-0.006
	(0.003)	(0.005)	(0.005)	(0.005)	(0.009)	(0.007)	(0.012)
Unemployed	0.021***	0.022***	0.024***	0.022***	0.016***	0.018***	0.023***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)	(0.004)	(0.007)
Salary (£)	-1,269.9***	-1,462.1***	-1,098.9***	-555.2**	-774.9**	-826.3***	-1,345.8***
	(149.5)	(201.7)	(198.7)	(220.1)	(375.1)	(294.3)	(482.8)
LGB sample *N*	10,977	10,958	10,584	8,130	2,457	4,899	1,525
LGB sample %	100	99.83	96.42	74.06	22.38	44.63	13.89
c) Variables used for matching & size of the matched sample							
baseline controls	N	Y	Y	Y	Y	Y	Y
tariff points	N	N	Y	Y	Y	N	Y
degree subject	N	N	N	Y	Y	Y	Y
name of university	N	N	N	N	Y	Y	Y
degree class	N	N	N	N	N	Y	Y

Notes: All data are provided by JISC/HESA as extremely sensitive secure data. This is available to eligible qualified researchers on application and fees paid to JISC, and subject to conditions imposed by JISC/HESA. LGB refers to respondents who answer the self-identification sexual orientation question as 'lesbian, gay, bisexual, other' and heterosexual in the remaining categories. The table shows subjects divided across categories. The division into LEM, STEM, HUM follows the existing literature. Variables in 'baseline controls' are the demographics in Table 1: age, social class, ethnicity, disability, state school. The variable 'tariff points' uses the official calculator for translating letter grades on A-levels. The variables 'name of university' and 'degree subject' are the actual university and the name of the degree subject studied. The variable 'degree class' is the actual degree classification from first, upper second, lower second, etc. *** shows significance at the 1% level, ** at the 5% level, and * at the 10% level.

References

Abadie, Alberto, and Guido W Imbens. 2006. "Large sample properties of matching estimators for average treatment effects." *Econometrica* 74 (1): 235–267.

Abadie, Alberto, and Guido W Imbens. 2011. "Bias-corrected matching estimators for average treatment effects." *Journal of Business & Economic Statistics* 29 (1): 1–11.

Abadie, Alberto, and Guido W Imbens. 2016. "Matching on the estimated propensity score." *Econometrica* 84 (2): 781–807.

Aksoy, Cevat G, Christopher S Carpenter, and Jeff Frank. 2018. "Sexual orientation and earnings: New evidence from the United Kingdom." *ILR Review* 71 (1): 242–272.

Aksoy, Cevat Giray, Christopher S Carpenter, Jeff Frank, and Matt L Huffman. 2019. "Gay glass ceilings: Sexual orientation and workplace authority in the UK." *Journal of Economic Behavior & Organization* 159: 167–180.

Armstrong, John, and Alice Sullivan. 2024. "LGBT+ representation higher education in England and Wales." *British Journal of Sociology of Education* 45 (6): 875–891.

Badgett, MV Lee. 1995. "The wage effects of sexual orientation discrimination." *ILR Review* 48 (4): 726–739.

Badgett, MV Lee, Christopher S Carpenter, and Dario Sansone. 2021. "LGBTQ economics." *Journal of Economic Perspectives* 35 (2): 141–170.

Blundell, Richard, Lorraine Dearden, Alissa Goodman, and Howard Reed. 2000. "The returns to higher education in Britain: evidence from a British cohort." *The Economic Journal* 110 (461): 82–99.

Britton, Jack, Franz Buscha, Laura van der Erve, Chris Belfied, Anna Vignoles, Matt Dickson, Ian Walker, Lorraine Dearden, and Luke Sibieta. 2022a. "How much does degree choice matter?" *Labour Economics* 79.

Britton, Jack, Ian Walker, Ben Waltmann, and Yu Zhu. 2022b. "How much does it pay to get good grades at university." *Department for Education/IFS*.

Burn, Ian, and Michael E Martell. 2020. "The role of work values and characteristics in the human capital investment of gays and lesbians." *Education Economics* 28 (4): 351–369.

Codiroli Mcmaster, Natasha. 2017. "Who studies STEM subjects at A level and degree in England? An investigation into the intersections between students' family background, gender and ethnicity in determining choice." *British Educational Research Journal* 43 (3): 528–553.

Greifer, Noah, and Elizabeth A Stuart. 2021. "Choosing the causal estimand for propensity score analysis of observational studies." *arXiv preprint arXiv:2106.10577*.

Hanson, Michael, and Diana Quintero. 2018. "How gender diversity among the teacher workforce affects student learning." `https://www.brookings.edu/articles/how-gender-diversity-among-the-teacher-workforce-affects-student-learning/`.

Henderson, Morag. 2015. "Understanding bullying experiences among sexual minority youths in England." *Centre for Longitudinal Studies Working paper/8*.

Hughes, Bryce E. 2018. "Coming out in STEM: Factors affecting retention of sexual minority STEM students." *Science Advances* 4 (3): eaao6373.

Jadva, V, A Guasp, JH Bradlow, S Bower-Brown, and Sarah Foley. 2023. "Predictors of self-harm

and suicide in LGBT youth: The role of gender, socio-economic status, bullying and school experience." *Journal of Public Health* 45 (1): 102–108.

Mittleman, Joel. 2022. "Intersecting the academic gender gap: The education of lesbian, gay, and bisexual America." *American Sociological Review* 87 (2): 303–335.

Mize, Trenton D. 2016. "Sexual orientation in the labor market." *American Sociological Review* 81 (6): 1132–1160.

Ñopo, Hugo. 2008. "Matching as a tool to decompose wage gaps." *The Review of Economics and Statistics* 90 (2): 290–299.

Sansone, Dario, and Christopher S Carpenter. 2020. "Turing's children: Representation of sexual minorities in STEM." *PloS one* 15 (11): e0241596.

Sarzosa, Miguel. 2023. "Sexual orientation and labor market disparities." *Journal of Economic Behavior & Organization* 212: 723–755.

Walker, Ian, and Yu Zhu. 2011. "Differences by degree: Evidence of the net financial rates of return to undergraduate study for England and Wales." *Economics of Education Review* 30 (6): 1177–1186.

Walker, Ian, and Yu Zhu. 2018. "University selectivity and the relative returns to higher education: Evidence from the UK." *Labour Economics* 53: 230–249.