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Does intergenerational educational mobility vary by sexual identity?

A comparative analysis of 5 OECD countries

Abstract

Lesbian, gay, and bisexual (LGB) people are disadvantaged in terms of health and socioeconomic status compared to heterosexual people, yet findings pertaining to educational outcomes vary depending on the specific identity and gender considered. This study delves into these unexplained findings by applying a social-stratification lens, thereby providing an account of how intergenerational educational mobility varies by sexual identity. To accomplish this, we use representative data from five OECD countries, and a regression-based empirical specification relying on coarsened exact matching. We find that gay and lesbian people have higher educational attainment than heterosexual people in all five countries, and that these higher levels of education stem from greater rates of upward educational mobility among gay/lesbian people. There were, however, few differences between heterosexual and bisexual people. Variation across countries emerged when analyses were stratified by gender, with higher rates of upward mobility observed for gay men in Australia, Chile, the UK and the US, and lesbian women in Australia and Germany. Overall, our results align with previous claims that education can be a strategy for gay/lesbian people to avoid actual or anticipated discrimination. However, variation in these patterns across groups suggests that other mechanisms may also be at play.

Lesbian, gay, and bisexual (LGB) people experience worse health, wellbeing, and socioeconomic outcomes than heterosexual individuals, including disparities in earnings and occupational standing (Duncan and Hatzenbuehler, 2014; Gates, 2015; Perales and Campbell, 2020; Russell and Fish, 2016).[1] Understanding the social determinants of these disparities, and

the extent to which they represent a violation of principles of equality of opportunity, is therefore an important endeavor. Evidence regarding educational outcomes, which are central to the above processes, primarily comes from the US and is surprisingly mixed (see summary table in Online Appendix A).

With some exceptions (Badgett, 1995), studies using behavior-based measures of sexual orientation report higher educational attainment among men and women in same-sex unions or with a history of same-sex sexual behavior (Black et al., 2000; Black et al., 2003; Verbakel, 2013). However, findings from studies measuring sexual orientation through self-reports vary by gender, sexual-orientation category, and educational outcome. Some report lower educational attainment among bisexual men and bisexual/lesbian women than among heterosexual individuals (Mollborn and Everett, 2015; Mittleman, 2022), whereas others report no differences for bisexual men (e.g., high-school graduation rates, Mittleman, 2022) or higher attainment among certain subgroups of bisexual men (e.g., those enrolled in college, Mollborn and Everett, 2015) and lesbian women (e.g., older and white cohorts, Mittleman 2022). Quantitative studies consistently find that gay men are more highly educated than heterosexual men (Mittleman, 2022), despite qualitative studies showing that gay men struggle more in school than both heterosexual people and lesbian women (Pascoe, 2007). Most of these studies are US-based. As an exception, Verbakel's (2013) study documented higher levels of education among men and women in same-sex relationships in the Netherlands, as well as a greater likelihood of having studied a care-related field of education. In sum, the relationship between sexual identity and educational attainment remains poorly understood, with existing findings being also largely parochial to the US.

In this study, we aim to enhance our understanding of sexual-identity differences in educational outcomes by considering intergenerational educational mobility—that is, the extent to which adult children's educational outcomes mirror their parents' outcomes. This

approach offers greater insight into processes of (in)equality of opportunity (Li and Heath, 2016). First, intergenerational mobility analyses account explicitly for social background. If group differences in outcomes are produced by differences in social background, outcome differences are only poor indicators of inequality of opportunity (Chetty et al., 2020). Second, intergenerational mobility analyses can identify whether differences in socioeconomic outcomes are primarily produced by challenges in attaining education among low-status groups or the ability of high-status groups to maintain advantage (Bernardi, 2014). Besides redirecting attention towards questions of intergenerational mobility, we also expand the geographical scope of this research area by analyzing five large-scale representative surveys from Australia, Chile, Germany, the United Kingdom (UK), and the United States (US). This is an important step forward in the literature, as the experiences of LGB people differ considerably across country contexts. Methodologically, we innovate by deploying an empirical regression-based strategy relying on coarsened exact matching (CEM).

CONCEPTUAL FRAMEWORK

Theorizing sexual-identity differences in the intergenerational transmission of education

Educational advantage is transmitted from parents to children through a wide variety of channels, including different forms of economic, cultural, and social capital (Bourdieu, 1986; Coleman, 1988). If sexual identity shapes access to these resources, the connection between parental education and educational attainment could differ between LGB and heterosexual individuals.

On the one hand, LGB people may have lower access to parental resources than heterosexual people. Within heteronormative societies, LGB people risk experiencing parental rejection due to their sexuality (Russell and Fish, 2016), as reflected in lower levels of closeness to parents, more conflict with parents, and less support from parents (Fischer &

Kalmijn, 2021; Hank and Salzburger, 2015; Perales and Huang, 2020). These experiences can reduce the intensity of parental efforts to transmit financial, cultural, and social capital onto their offspring. Indeed, parental investments are not equally distributed across children, and those with whom parents have the closest relationships receive more and greater transfers (Lennartsson et al., 2010). Overall, this perspective suggests that *the transmission of advantage will be weaker among LGB than heterosexual individuals (H1a).*

On the other hand, LGB youth are at an increased risk of experiencing school bullying and social exclusion, and frequently report homophobic behaviors from both peers and teachers (Pascoe, 2007; Pearson and Wilkinson, 2018). Exposure to hostile school environments can negatively affect school performance by increasing absenteeism and disengagement (Robinson and Espelage, 2012). Therefore, parental support may be comparatively important for LGB individuals to overcome these challenges (Russell and Fish, 2016). If parental resources matter more for the educational outcomes of LGB than heterosexual individuals, then a competing hypothesis can be formulated: *the transmission of advantage will be stronger among LGB than heterosexual people (H1b).*

Distinguishing upward from downward mobility

From an inequality of opportunity perspective, distinguishing between downward educational mobility (i.e., being less highly educated than one's parents) and upward educational mobility (i.e., being more highly educated than one's parents) signals more directly unequal educational opportunities.

Concerning downward educational mobility, studies on the transmission of socioeconomic advantage have shown that well-resourced parents are able to prevent downward mobility of their children. When their children face barriers to educational success, well-off parents increase their investments to preclude these factors from affecting their

educational attainment—a process referred to as "compensatory advantage" (Bernardi, 2014). If LGB people from advantaged backgrounds have less access to their parents' resources than heterosexual people, *this will put them at an increased risk of downward mobility as compared to heterosexual individuals with the same parental background (H2).*

Minority stress—or the negative treatment of individuals due to their LGB status (Duncan and Hatzenbuehler, 2014)—can also contribute to downward educational mobility among LGB people. Minority stressors such as discrimination and micro-aggressions may put pressure on their academic performance. Consistent with this, a voluminous body of research has documented how LGB youth experience a range of unique stressors within the school context (Pearson and Wilkinson, 2018; Robinson and Espelage, 2012), in addition to those experienced within families, neighborhoods, and other social environments.

The mechanisms discussed so far suggest *higher rates of downward educational mobility for LGB individuals (H2),* but they would also predict *lower rates of upward educational mobility (H3a).* However, there are also factors that may contribute to higher rates of upward educational mobility among LGB individuals. The sociology of education literature distinguishes between primary and secondary effects on educational attainment. Primary effects are those that affect school performance, whereas secondary effects are those that affect educational choices—such as deciding to continue education or enroll in university (Boudon, 1974). For example, students from socioeconomically disadvantaged backgrounds are less likely than students from more advantaged backgrounds to enroll in university, even when they attain the same grades (Jackson et al., 2007). Sexual identity could have secondary effects on educational attainment, chiefly by affecting educational choices and incentives to attain university degrees.

Stigma toward sexual minorities is more palpable and intense in 'low-education' and 'low-income' environments. For example, individuals with lower education and income hold

less supportive views towards LGBTQ+ people (Perales and Campbell, 2018), and sexual minorities experience greater discrimination in occupations requiring lower-level educational credentials (Mollborn and Everett, 2015; Ueno et al., 2013). University degrees can thus be a pathway for LGB people to escape or avoid social environments where sexual stigma is comparatively high, and this may increase their perceived benefits of—and incentives for—higher education. A university degree may also provide LGB individuals with greater financial and social resources to avoid or buffer minority stressors, and to overcome economic, social, or legal obstacles toward achieving normative life goals (e.g., marriage or parenthood) (Barrett et al., 2002). Further, research shows that many young gay/bisexual men—especially those who conceal their identity—derive their self-worth from academic success and competition (Pachankis and Hatzenbuehler, 2013). In short, when considering these incentives, we can formulate a competing hypothesis to H3a: *LGB individuals will exhibit higher rates of upward mobility than heterosexual individuals (H3b).*

Theorizing differences by sexual identity

So far, we have discussed LGB people as a monolithic group. However, there are plausible reasons to expect differences in intergenerational education mobility across different minority identities. Bisexual people face pronounced minority stressors—including biphobia, misrecognition or erasure of their identities, and stereotypes about their sexuality (e.g., around promiscuity or it being 'a phase')—which makes them more prone to exhibiting poor health and wellbeing outcomes (Mize, 2016; Pollitt et al., 2017). These additional stressors could lead to *higher rates of downward educational mobility and lower rates of upward educational mobility among bisexual compared to gay/lesbian individuals (H4).* In addition, bisexual people are less often 'out' to their families, friends, and co-workers than gay/lesbian people (Doan and Mize, 2020; Pew Research Centre, 2019). This could weaken the relationship

between having a bisexual identity and direct experiences of general discrimination or parental rejection—although it could also put pressure on educational performance through other pathways (e.g., increased stress due to identity concealment).

Theorizing gender differences

Given previous research revealing substantial disparities in the educational experiences of lesbian women and gay men (Pascoe, 2007), there may also be gender differences in the relationship between sexual identity and intergenerational educational mobility. Mittleman (2022) showed that gay men in the US are more highly educated than heterosexual men, whereas lesbian and bisexual women are less highly educated than heterosexual women (with the exception of older white cohorts of lesbian women). One explanation for this pattern is the persistence of cultural expectations to "do gender" normatively within schools. This includes the perception of academic effort being incompatible with socially constructed understandings of masculinity and the perception of diligence in school settings as being a feminine trait, a finding that is also central to studies on gender gaps in educational attainment (Legewie and DiPrete, 2012). Lower incentives for gay/bisexual men to perform "manhood" may thus help them avoid the "academic cost of masculinity" (Mittleman, 2022). In contrast, lesbian/bisexual women may on average underinvest in education to avoid being considered feminine—which is consistent with their comparatively high propensity to be subjected to school disciplinary measures (Mittleman, 2018). If these propositions hold, we would anticipate *higher upward mobility and lower downward mobility among LGB men as compared to LGB women (H5).*

Incorporating a cross-national angle

In an effort to move the existing academic debates in the field beyond their current US-centric focus, we examine sexual-identity-based educational disparities and processes of intergenerational educational mobility across five OECD countries—Australia, Chile, Germany, the UK, and the US. These are, to our knowledge, the only five countries for which sufficiently large datasets with information on sexual identity, respondents' education, and parental education exist (OECD, 2019). Importantly, there is meaningful variation in terms of discrimination and stigma against sexual minorities across these countries. For example, in the 2005-2009 wave of the World Values Survey, the percentage of respondents who did not want to have "homosexuals" (sic) as neighbors was ~34% in Chile, ~25% in the US, ~21% in Australia, ~17% in the UK, and ~15% in Germany (Adamczyk and Liao, 2019). Importantly, the percentage of unsupportive individuals differs by respondents' education. Specifically, the difference in the share of lowly and highly educated individuals who do not want "homosexuals" (sic) as neighbors lead to a similar country ranking: ~12 percentage points in Germany, ~20 in Chile, ~25 in the UK, ~27 in Australia, and ~41 percentage points in the US.[2] These differences support the argument that education may be a more effective resource for LGB people to escape discrimination in certain countries (Pachankis and Hatzenbuehler, 2013; Mittleman, 2022). Regarding the legislation operating during our observation period (2008-2019), Australia (2007/2013), Germany (2006), and the UK (2007/2010) had all included sexual orientation in anti-discrimination laws, whereas this only applied to certain states in the US (although workplace discrimination based on sexual orientation or gender identity was ruled illegal by the US Supreme Court, in Bostock v. Clayton County, in 2020). In Chile, same-sex sexual behavior was illegal until 1999, but rapid changes have taken place, including new anti-discrimination laws in 2012.

Many of the mechanisms discussed in the theoretical framework relate to sexual stigma, and LGB people's incentives to attain education to escape discrimination or

accumulate resources to cope with it. From this prism, two competing expectations can be formulated regarding cross-national differences in the relationship between sexual identity and educational attainment. On the one hand, because of reduced barriers to education, one could expect LGB people's average educational attainment to improve as discrimination and stigma decline. This situation would then result in higher rates of upward educational mobility and lower rates of downward educational mobility in contexts with less discrimination and stigma. On the other hand, if reductions in discrimination and stigma make sexual identity less relevant for educational outcomes, rates of upward and downward educational mobility may be more similar across sexual identities in contexts with less discrimination and stigma . Because several studies have reported that educational attainment is higher among LGB than heterosexual individuals, this may imply relatively *lower* levels of educational attainment among LGB individuals in contexts characterized by low stigma and discrimination.

While stigma and discrimination are salient factors, they may not be the only country characteristic influencing the relationship between sexual identity and educational mobility. For example, factors such as age at educational tracking, standardization of curricula and examinations, and financial returns to education may also play a role (Bol & Van de Werfhorst, 2013). Further, it is possible that differences in measurement instruments across countries may contribute to any observed disparities. We return to these considerations when we discuss our findings.

DATA AND METHODS

Datasets and sample selection

Our analyses are based on data from five nationally representative surveys: The Household, Income and Labour Dynamics in Australia (HILDA) Survey; the Chilean National Survey of Socioeconomic Characteristics (CASEN); the German Socioeconomic Panel (SOEP); the UK

Household Longitudinal Study (UK-HLS); and the US General Social Survey (GSS). Detailed descriptions of these data sources have been published elsewhere (Buck and McFall, 2011; Fischer et al., 2022; Marsden et al. 2020; Ministerio de Desarollo Social y Familia, 2017; Watson & Wooden, 2012). Three datasets are annual household panel surveys in which information on respondents' sexual identity was collected in multiple waves: 2012, 2016 and 2020 in HILDA, 2016 and 2019 in SOEP, and 2011/2012 and 2017/2018 in UK-HLS. For these datasets, we maximize information by pooling observations across years and clustering standard errors by individuals. Robustness checks where we use the last available wave with complete information for each individual yield similar substantive results (Online Appendix B).[3] The GSS and CASEN are cross-sectional surveys. The GSS is conducted every two years and we pool observations across iterations in which sexual-identity information was collected (2008, 2010, 2012, 2014, 2016, and 2018). The CASEN data was collected in 2017.

To arrive at the analytical sample, we first identified all individuals interviewed in waves collecting sexual-identity data. Second, we selected respondents aged 25 to 85 years to focus on a population that has mostly completed their educational career. This excluded 11% (US) to 36% (Chile) of the observations. Third, we dropped cases with missing information on self or parental education, sex/gender, ethnicity/migration background, age, or the educational level of both parents. This excluded a further 3% (Australia/US) to 15% (UK) of observations. [4] In Chile, parental education was only asked of the head of household, leading us to drop a further 51% of the sample (people who were not head of the household). The final analytic sample sizes were 25,000 in HILDA; 48,604 in CASEN; 41,167 in SOEP; 53,564 in the UK; and 9,462 in the US. In additional analyses, we replicated our main results using imputation techniques to account for missing data on parental and own education. Since the pattern of results remained unchanged, we only present these in the appendix (Online Appendix C) and retain the more parsimonious analyses here.

Measuring sexual identity

As others before us (see e.g., Mittleman, 2022; Mize, 2016), we identify LGB people based on information on self-reported sexual identity. In HILDA and UK-HLS, this information is collected through the same question: *Which of the following options best describes how you think of yourself?*, with the following response options: *Heterosexual or Straight, Gay or Lesbian, Bisexual, Other, Prefer Not to Say,* and *Don't Know* (UK-HLS) or *Unsure/Don't Know* (HILDA). In Casen and the GSS, the question is similar, but the *Other* response option is not included in the GSS. In Germany, the response options translate to *Heterosexual*, *Homosexual, Bisexual*, *None of the above,* and *No answer/Prefer not to say.* In the 2019 SOEP wave, the *None of the above* option was no longer available.

Self-reports of sexual identity sometimes can vary over time for the same individuals participating in multiple waves of HILDA, SOEP or UK-HLS (see Online Appendix D). Because of this, our analyses pool observations across waves—that is, we treat each observation from an individual as a different "case". For example, if an individual participated in two survey waves and was therefore asked the same questions, we would include each wave as a separate observation. To prevent this course of action from resulting in an artificial reduction in the standard errors, we followed the convention in studies using these methods and clustered the standard errors in the regression models by individuals.

Harmonizing these data, we arrived at the following sexual-identity categories: (i) heterosexual, (ii) gay/lesbian, (iii) bisexual, (iv) other, and (v) unsure/refused/prefer not to say. Because the *Other* group is complex to interpret, our main analyses focus on the first three groups of individuals. Online Appendix D contains a detailed discussion of measurement issues related to sexual identity, whereas Online Appendix E presents the results for respondents who answered *Other* or refused to answer. The unweighted number (weighted percentage) of observations in which respondents in our sample identified as LGB was 1,137

(2.9%) in HILDA, 654 (1.5%) in CASEN, 904 (1.8%) in SOEP, 832 (2.5%) in UK-HLS, and 389 (3.4%) in the GSS (Table 1).

Measuring education and educational mobility

The dependent variables of interest are measures of intergenerational educational mobility, defined as the difference between respondents' educational attainment at the time of the survey and their parents' highest level of education. In the main analyses, the highest level of education is divided into three categories: (i) Lower secondary education or less (ISCED 1-2), (ii) upper secondary education or vocational qualifications (ISCED 3-4), and (iii) university or other tertiary degrees of at least two years of duration (ISCED 5-6). More nuanced classification schemes were not available for all countries (DiPrete et al., 2017). However, given the importance of vocational qualifications in Germany, we also ran robustness checks using a five-category education variable for that country (using the CASMIN classification; see Online Appendix F). For parental education, we followed earlier studies (see e.g., Bernardi, 2014 and Chetty et al., 2020) and used the same categories and considered the highest educational qualification obtained by *either* of the parents. When information for one parent was missing, we coded this variable based on the information for the other parent only.

Individuals are treated as being *intergenerationally mobile* if their education differs from the highest level of education of either of their parents, *downwardly mobile* if their education is lower than the highest level of education of either of their parents, and *upwardly mobile* if their education is higher than the highest level of education of either of their parents. Importantly, the outcome variables capturing upward and downward intergenerational educational mobility are only derived for individuals at risk of such mobility. Specifically, individuals with tertiary-educated parents are not part of the upward-mobility analyses and individuals whose parents both have lower secondary education (or less) are not part of the

downward-mobility analyses. Note that because this classification depends on the highest level of parental education, individuals can have the same level of education as one of their parents (i.e., the lower educated parent) and still be coded as educationally mobile. In Online Appendix F, we present results of more complex specifications using an education measure that simultaneously considers both parents' education. Table 1 describes the samples used in the analysis (for descriptive statistics stratified by sexual identity, see Table G1 in the Online Appendix).

Analytic approach

Our analytical approach encompasses two distinct sets of analyses. First, we represent patterns of intergenerational educational mobility using flowcharts, as proposed by Laurison and colleagues (2020). This approach enables us to visualize the distributions of parental and own education, as well as the mobility rates between these.

Second, we fit country-specific sets of regression models to estimate sexual-identity differences in intergenerational educational mobility. In this analytic component, we provide an overall estimate of sexual-identity differences in such mobility using Coarsened Exact Matching (CEM) (Iacus, King and Porro, 2012). The advantage of this method over traditional regression models is that it more effectively controls for observed compositional differences between groups. This includes any possible interactions between the control variables and the focal explanatory variable capturing respondents' sexual identity. For example, the LGB samples are much younger than the heterosexual samples; if there are any cohort changes in the effect of parental education (or any other variable) on educational outcomes, the inclusion of a simple control for age would be insufficient to account for compositional differences across sexual-identity groups.

Table 1. Descriptive statistics

	Australia %	Chile %	Germany %	UK %	US %
Sexual identity					
Gay/Lesbian	1.5	1.3	1.1	1.5	1.6
Bisexual	1.4	0.2	0.7	1.0	1.8
Other	0.9	0.1	3.6	0.7	
Refused/Prefer not to Say	5.3	0.2	6.3	2.9	1.8
Gender					
Woman	51.8	43.8	51.2	53.6	54.6
Own education					
ISCED 1-2 (Lower secondary or less)	20.5	23.1	10.5	26.0	6.0
ISCED 3-4 (Higher secondary)	35.2	47.5	56.7	34.5	59.1
ISCED 5-6 (Tertiary education)	44.3	29.4	32.8	39.5	34.9
Parental education					
ISCED 1-2 (Lower secondary or less)	31.5	11.6	14.6	13.0	18.4
ISCED 3-4 (Higher secondary)	41.5	26.8	68.3	53.4	57.3
ISCED 5-6 (Tertiary education)	27.1	11.6	17.1	13.0	24.2
Age group					
25-34 years	21.9	14.5	17.2	16.6	22.1
35-44 years	21.0	17.4	17.0	19.8	21.7
45-54 years	20.2	20.7	21.7	21.5	21.0
55-64 years	17.6	21.1	19.1	19.2	19.2
65-74 years	12.9	17.0	14.1	15.3	11.1
75-84 years	6.4	9.2	10.9	7.7	4.9
Migration background					
Native born		94.8	84.9	89.1	86.1
Foreign born		5.2	15.1	10.9	13.9
Ethno-migrant background					
Native born, non-Indigenous	66.1				
Native born, Indigenous	1.8				
Foreign born, other country	20.3				
Foreign born, major English-speaking country	11.8				
Race					
Black					13.5
Other					10.2
White					76.3
n (observations)	35,840	48,347	41,702	37,845	9,508

Notes: Weighted descriptive statistics. Data from 2012, 2016 and 2020 for HILDA (Australia), 2017 for CASEN (Chile), 2016 and 2019 for SOEP (Germany), 2011/2012 and 2017/2018 for UK-HLS (UK), and 2008-2018 for the GSS (US).

The CEM procedure relies on selecting samples from two groups that have the exact same observed characteristics. In our case, this method is powerful because we are able to draw, for virtually every LGB individual, at least one exact match from the comparatively

large pool of heterosexual individuals. We match on a small set of observable characteristics that can be considered exogenous to sexual identity, differ considerably by sexual identity, and/or are key to our analysis. These characteristics include respondents' age (in five-year intervals), gender (for analyses pooling men and women), parental education, and country-specific measures of ethnicity (see Table 1). If more than one heterosexual match is available for an LGB individual, all cases are included and weights are created to adjust for their number. Matches are created separately by country, gender (for analyses pooling men and women), and sexual-identity group.

Applying these procedures, 4,026 of 4,029 LGB individuals had at least one exact heterosexual match in the data. Using these matched samples, we fitted linear probability models of the different mobility outcomes. In robustness checks, we also used logistic regression—see Online Appendix C) and alternative estimation methods, including 'unidiff' and log-linear models (Erikson & Goldthorpe, 1992; Jann & Seiler, 2020) (see Online Appendix H). Reassuringly, all of these supplementary analyses yielded similar results to those presented in the main body of the paper, adding confidence to our findings.

VISUALIZING INTERGENERATIONAL EDUCATIONAL MOBILITY ACROSS SEXUAL-IDENTITY GROUPS

Figures 1a to 1e portray intergenerational mobility flows for the five countries considered in this study. The charts show both the distribution of parental educational attainment (left side) and the distribution of own educational attainment (right side) for each group considered. Accompanying tables containing the numerical values for the transition rates are presented in Online Appendix F.

Figure 1a. Share of respondents attaining low, middle, and high education by parental education (Australia)

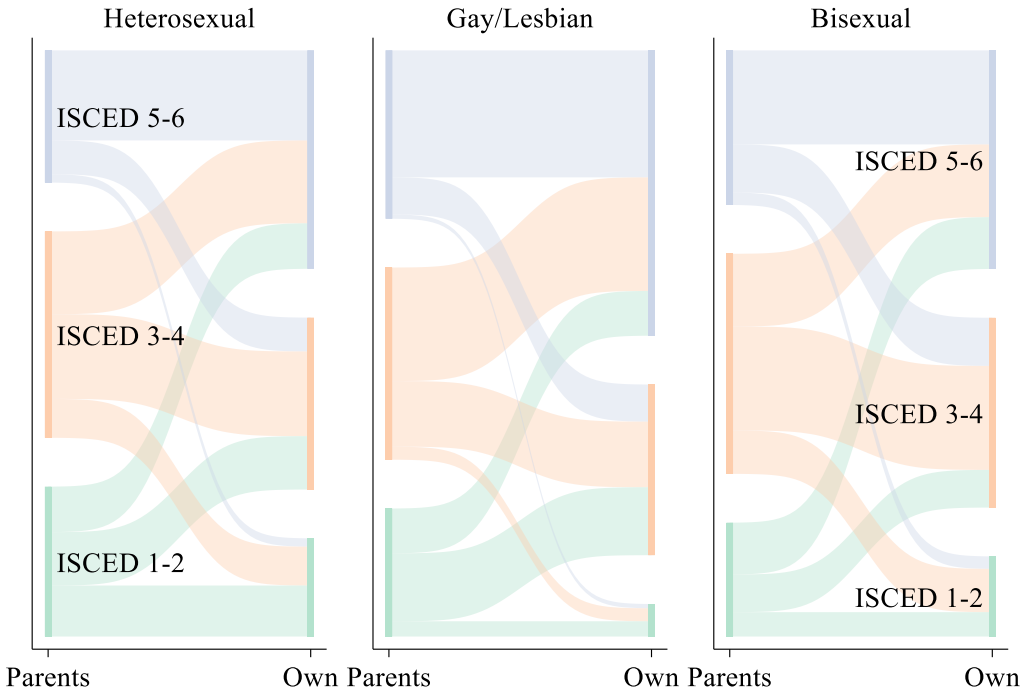


Figure 1b. Share of respondents attaining low, middle, and high education by parental education (Chile)

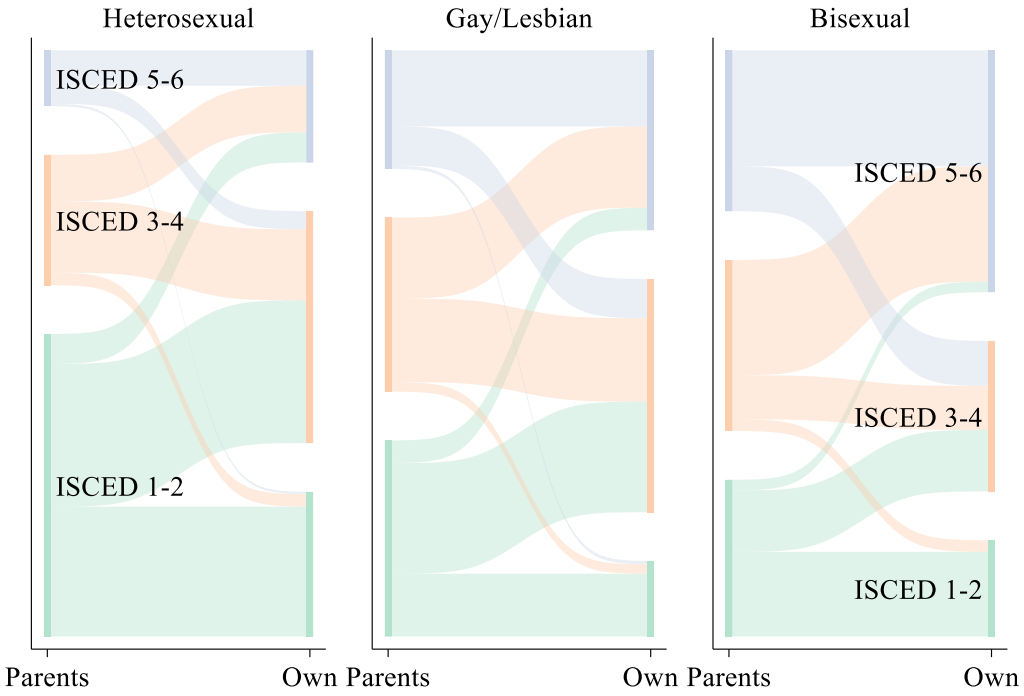


Figure 1c. Share of respondents attaining low, middle, and high education by parental education (Germany)

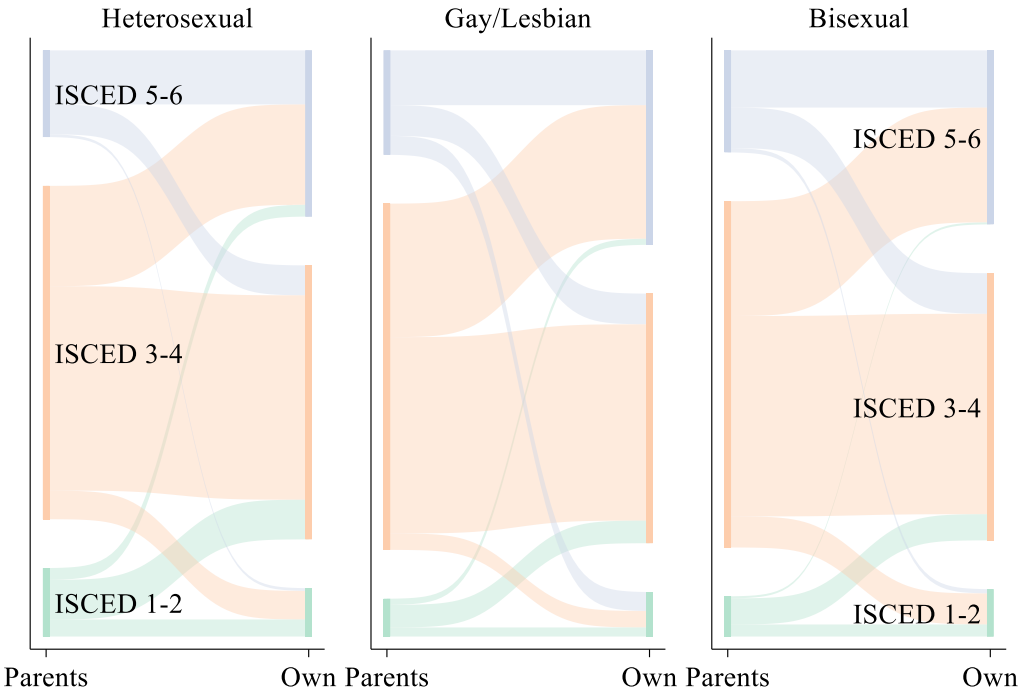


Figure 1d. Share of respondents attaining low, middle, and high education by parental education (UK)

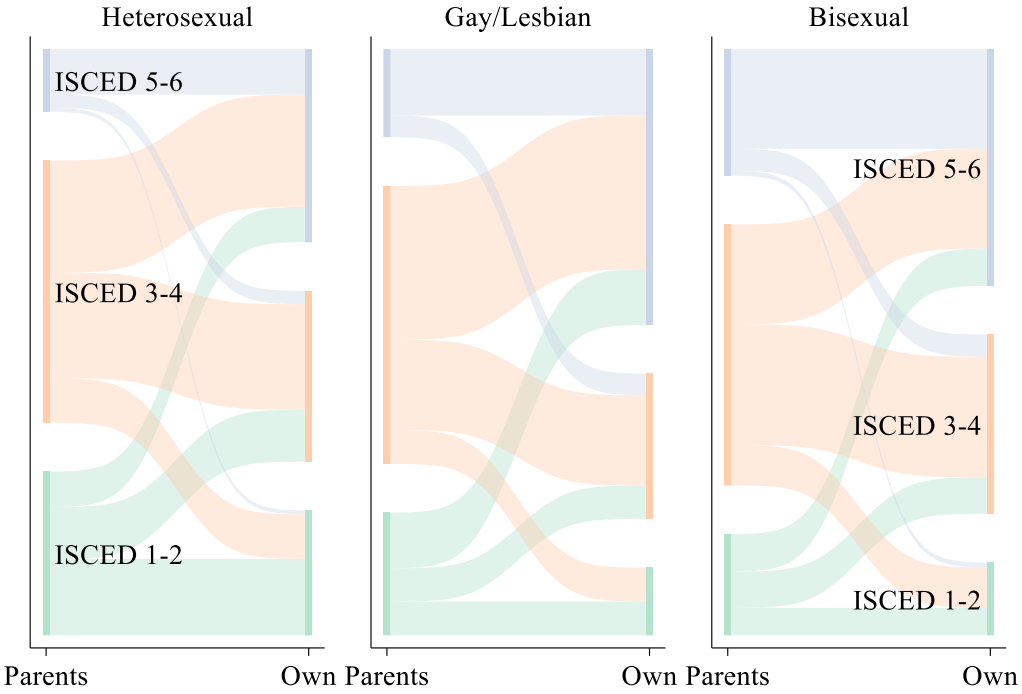
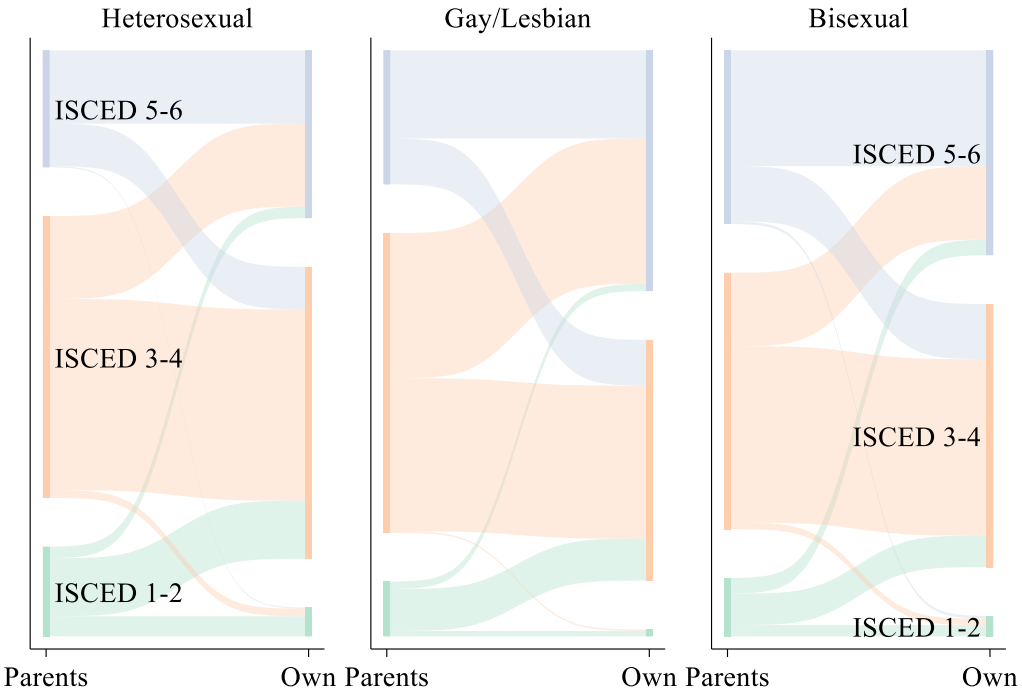


Figure 1e. Share of respondents attaining low, middle, and high education by parental education (US)



Notes: Flowcharts based on weighted descriptive statistics (Table 1). Data from 2012, 2016 and 2020 for HILDA (Australia), 2017 for CASEN (Chile), 2016 and 2019 for SOEP (Germany), 2011/2012 and 2017/2018 for UK-HLS (UK), and 2008-2018 for the GSS (US).

The flowcharts clearly demonstrate that gay/lesbian individuals have higher levels of education than heterosexual individuals in all five countries. This difference ranges from 6 percentage points in Germany to 17 percentage points in the UK. For bisexual people, however, the pattern is less clear: they fall in-between heterosexual and gay/lesbian people in the UK and the US; they are the highest educated group in Chile; and they have education rates similar to heterosexual people in Australia and Germany.

The charts also reveal differences in parental education by sexual identity, particularly when examining individuals with lower levels of parental education. Compared to differences in own education, differences in parental education between heterosexual and gay/lesbian individuals are relatively small. As an exception, 24% of gay/lesbian individuals in Chile have a tertiary-educated parent, compared to 11% of heterosexual individuals. In the case of

bisexual individuals, we observe considerably higher levels of parental education in Chile, the UK and the US. These results suggest that parental-education differences may explain a greater portion of the educational advantages observed for bisexual individuals in some countries, whereas differences in mobility rates may be primarily responsible for the higher education levels observed among gay/lesbian individuals.

Inspecting the flows from left to right offers an indication of the level of intergenerational educational mobility. The clearest difference across sexual-identity groups relates to upward mobility, which was greater for gay/lesbian than heterosexual individuals across countries. Higher levels of upward mobility are particularly visible for gay/lesbian persons whose parents have upper secondary (ISCED 3-4) education. To illustrate this point, in Australia, 59% of gay/lesbian individuals whose- parents have upper secondary education (ISCED 3-4) attained tertiary education, compared to just 40% of heterosexual individuals with the same level of parental education. The smallest difference was observed in Germany, where these percentages were 39% and 30%, respectively. In Chile, it was bisexual people who displayed the highest rates of upward mobility. For example, among individuals who parents had ISCED 3-4 education, 67% of bisexual people compared to 46% of gay/lesbian people, and 35% of heterosexual people were upwardly mobile.

For downward mobility, few differences can be observed by sexual identity. The exception here is Australia, where gay/lesbian individuals were less likely to be downwardly mobile than heterosexual individuals, with bisexual individuals being the most likely. For example, downward-mobility rates for individuals with tertiary-educated parents were 25% for gay/lesbian people, 32% for heterosexual people, and 39% for bisexual people. In the next section, we provide formal statistical tests of differences in mobility rates by sexual-identity groups while accounting for compositional differences.

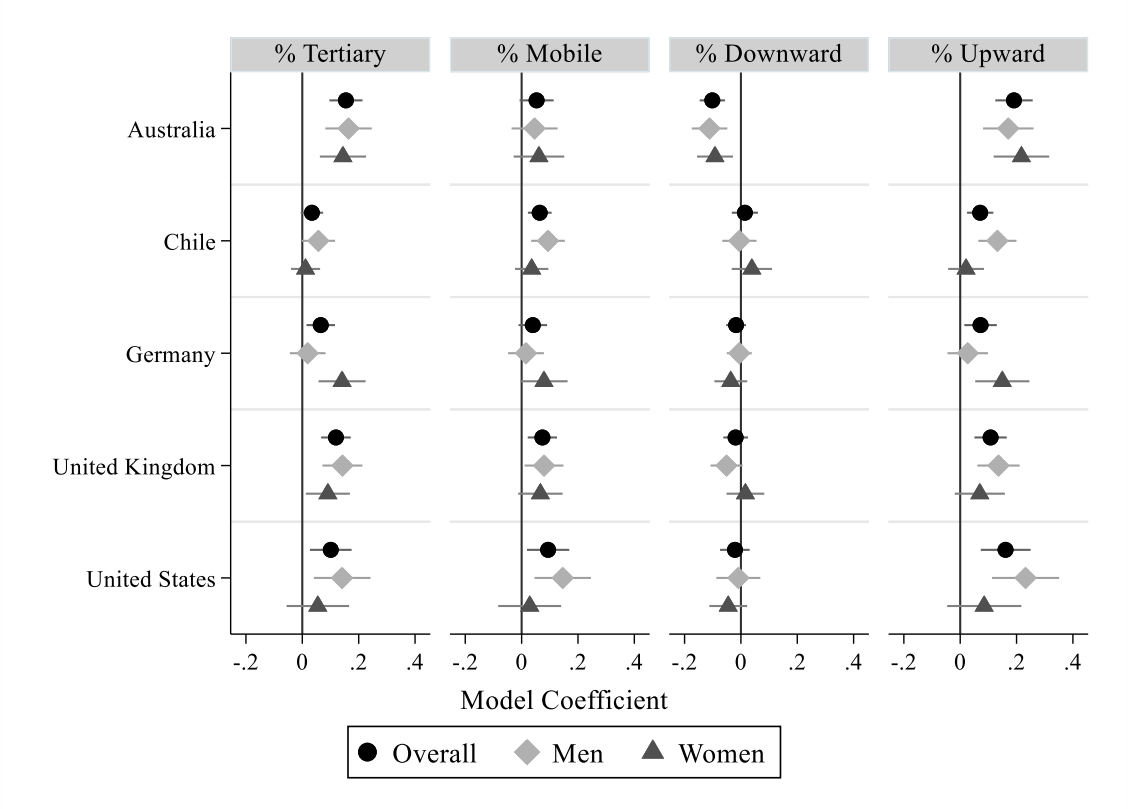
Mobility among gay and lesbian people

The key results of our regression models based on CEM are summarized graphically in Figures 2 and 3. Figure 2 compares rates of tertiary-education attainment and different measures of intergenerational educational mobility (overall, downward, and upward) for heterosexual and gay/lesbian individuals matched on their age, parental education, foreign-born status, and ethnicity.[5] As in the descriptive charts discussed before, we observe higher levels of tertiary-education attainment among gay/lesbian individuals than heterosexual individuals across all countries. The largest difference is observed in Australia, where the share of gay/lesbian individuals with tertiary education is 16 percentage points higher than for heterosexual individuals. Stratifying the analyses by gender adds nuance to these results. While both lesbian women and gay men tend to be overrepresented among tertiary-education graduates, differences are small and insignificant for women in Chile and the US and for men in Germany.

The second panel of Figure 2 presents differences in the share of individuals who are educationally mobile (overall). We observe generally higher rates of educational mobility among gay/lesbian individuals compared to heterosexual individuals. Differences are however less striking than for educational attainment, especially in Australia.

In the third and fourth panels, intergenerational educational mobility is separated into downward and upward mobility, and the analytic samples are restricted to individuals at risk of experiencing those types of mobility (i.e., those with a tertiary-educated parent are excluded from upward-mobility analyses and those with lowly-educated parents are excluded from downward-mobility analyses). Overall, there are no notable or statistically significant differences in downward mobility rates between gay/lesbian and heterosexual people, with the exception of Australia (where downward mobility is lower among gay/lesbian individuals).

Figure 2. Coefficients of linear probability models based on matched samples explaining mobility among gay/lesbian individuals (Reference category: "heterosexual")



Notes: Coefficients from linear probability models (95% confidence intervals) based on CEM. Matching variables: age, ethno-migrant or racial background, parental education, and gender (in the pooled models). Each coefficient comes from a separate model for a specific country and mobility type; for the estimates for men and women separate models by gender are run.

However, and importantly, we do observe significantly higher rates of upward mobility among gay/lesbian individuals in all five countries. Further, the magnitude of the estimated effects is sizeable, ranging from a 7-percentage-point difference in Germany to a 19-percentage-point difference in Australia. To illustrate this point, 50% of heterosexual individuals with lower or middle parental education in Australia are upwardly mobile, compared to 70% of gay/lesbian individuals. Altogether, these results suggest that it is primarily the attainment of LGB individuals of lowly educated backgrounds that is responsible for differences in educational attainment and educational mobility between gay/lesbian and heterosexual people. Additional analyses (shown in Online Appendix H)

confirm that differences in educational attainment between gay/lesbian and heterosexual individuals are smaller, and in many cases inexistent, among those with higher-educated parents.

Estimating the models separately for men and women reveals some interesting differences. For example, the results reveal small and insignificant differences in upward intergenerational educational mobility among lesbian women in Chile, the UK and the US. In Germany, however, it is gay men who do not appear to attain greater mobility than their heterosexual counterpars.[6] In all other contexts and gender-based groups, gay/lesbian people outperform all other sexual-identity groups in terms of their rates of upward intergenerational educational mobility.

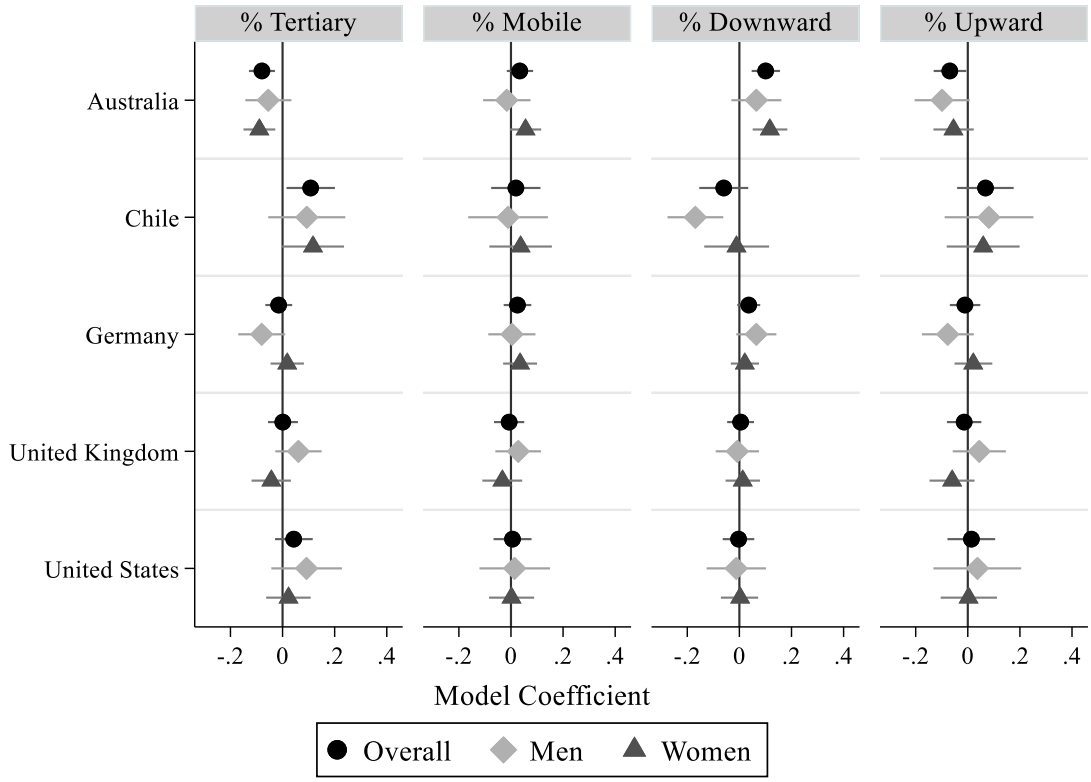
Mobility among bisexual individuals

Figure 3 displays the results of models comparing matched samples of bisexual and heterosexual individuals. The results show that the educational advantages among bisexual individuals in the UK and the US observed in the descriptive flowcharts (Figures 1a-1e) disappear when respondents are matched on their observable characteristics. This pattern of results indicates that compositional differences are responsible for the higher levels of education observed among bisexual individuals in those countries. In Chile, however, bisexual people remain more highly educated than their heterosexual matches. In Australia, significantly lower levels of attainment for bisexual individuals are still observed when using matched samples.

The estimates for intergenerational educational mobility show that all coefficients for overall mobility are close to zero and not statistically significant. A few statistically significant differences emerge once distinguishing between downward and upward mobility. In Australia, we observe a particularly disadvantageous pattern for bisexual people. Compared to heterosexual individuals, the share of bisexual individuals that is downwardly mobile is 10-

percentage-points higher than among heterosexual individuals. At the same time, the share of bisexual individuals that is upwardly mobile is 7 percentage-points lower. Some differences also emerge when distinguishing between men and women. In Chile, for instance, the share of bisexual men who are downwardly mobile is 17 percentage-points lower than for heterosexual men, although small cell sizes cast some doubts over this estimate.[5]

Figure 3. Coefficients of linear probability models based on matched samples explaining mobility among bisexual individuals (Reference category: "heterosexual")



Notes: Coefficients from linear probability models (95% confidence intervals) based on CEM. Matching variables: age, ethno-migrant or racial background, parental education, and gender (in the pooled models). Each coefficient comes from a separate model for a specific country and mobility type; for the estimates for men and women separate models by gender are run.

Additional analyses

To ascertain the validity and reliability of our findings, we conducted several sets of sensitivity analyses and robustness checks. These included: (i) using more traditional methods

to estimate mobility differences ('unidiff' and log-linear models), (ii) considering both parents' educational attainment, and (iii) estimating our main results using alternative model specifications. In this section, we briefly summarize the results of these additional analyses, with the results being presented in the Online Appendix.

First, we replicated our analysis of overall intergenerational educational mobility using 'unidiff' models. These models estimate the extent to which the association between parental and own characteristics differs across groups or contexts (Erikson & Goldthorpe, 1992). We also used log-linear models to examine whether upward and downward intergenerational educational mobility are more commonly observed among gay/lesbian and bisexual individuals than heterosexual individuals. These models rely on Poisson regressions predicting the frequency of combinations of parental and own education, including full 'sexual identity × parental education' and 'sexual identity × mobility category' interactions. The results, detailed in Online Appendix H, are highly consistent with those presented in the main text, albeit more often statistically significant (quite likely, because these models do not match individuals on observable characteristics). The only substantive difference was observed for gay men in the US, for whom log-linear models yielded a significantly greater likelihood of being downwardly mobile, compared to heterosexual individuals.

Second, we expanded our descriptive analyses by simultaneously considering the education levels of both parents (see Online Appendix F). When doing so, we observed little differences in educational outcomes by sexual identity for individuals with one or two highly educated parents. This pattern is consistent with our results for downward mobility reported earlier. In addition, these additional analyses indicated that gay/lesbian individuals are more likely to have tertiary education than heterosexual individuals across all other groups, which aligns with our findings on upward mobility. However, there was one exception to this

general trend, namely the absence of clear sexual-identity differences in educational outcomes among individuals who have two lowly educated (ISCED 1-2) parents, except in the UK.

Third, we replicated our analysis for Germany using the CASMIN (instead of ISCED) classification to capture both own and parental education. This classification enables a more nuanced partitioning of vocational education, which is an important education pathway within the German context. These results were substantively similar to those reported in the main text above, although the disadvantageous patterns of intergenerational educational mobility previously reported for bisexual men (i.e., higher downward mobility and lower upward mobility) become statistically significant (See Online Appendix F).

Finally, alternative specifications of our matching analysis using logistic regression and multiple imputation rendered practically identical results to those reported in Figures 2 and 3, as can be appreciated from the results presented in Online Appendix C.

DISCUSSION AND CONCLUSION

In this study, we have offered first-time insights into how sexual identity relates to intergenerational educational mobility in five OECD countries: Australia, Chile, Germany, the UK, and the US. To accomplish this, we leveraged nationally representative datasets and a CEM estimation approach. A key finding from our analyses was that individuals identifying as gay/lesbian are more highly educated than heterosexual people in all five countries, and that these higher levels of education stem from greater rates of upward educational among gay/lesbian people with lower- or middle-educated parents. These disparities were not only statistically significant, but often sizeable in magnitude.

Although our analyses are not designed to identify the specific mechanisms underpinning these processes, higher upward mobility among gay/lesbian people is consistent with theoretical perspectives emphasizing higher incentives to, and benefits from, educational

effort and attainment for this group compared to heterosexual people (H3a). Previous research has suggested that pro-school attitudes among LGB youth can be a deliberate strategy to prioritize achievements that are less dependent on specific individuals who may disapprove of their identity, including peers and family members (Pachankis and Hatzenbuehler, 2013; Mittleman, 2022). A similar, broader argument can be found in early social-stratification research, positing that social mobility is driven by the experience of psychological distress and the desire to escape 'toxic' childhood environments (Houle and Martin, 2011). If the challenges stemming from holding non-heterosexual identities are particularly pronounced in lower socioeconomic environments, this would incentivize LGB youth from these backgrounds to invest in academic success.

Comparisons between bisexual and heterosexual people, however, revealed similar rates of overall, upward, and downward intergenerational educational mobility between these two groups. At first sight, this finding is inconsistent with the incentive-based proposition described above. The similarities in the intergenerational educational pathways of bisexual and heterosexual people may stem from the observation that many bisexual individuals eventually settle for heteronormative lifestyles. For example, bisexual people may feel attractions for, and have a history of sexual relationships with, both men and women; yet most are in long-term, committed relationships with different-sex partners (e.g., 84% in a study by the Pew Research Center, 2019, see also Gates, 2015). Further, compared to gay/lesbian people, many bisexual people are not out to colleagues, family, or friends and, as a result, they may be less likely to be the direct target of discriminatory behaviors (Doan and Mize, 2020; Pew Research Centre, 2019). Hence, normative pressures could lead bisexual people from lower socioeconomic backgrounds to settle for heteronormative lifestyles instead of pursuing upwards mobility to escape stigmatizing social environments. We nevertheless found some support for theoretical predictions based on heightened levels of discrimination and stigma

towards bisexuality (H4). In Australia, bisexual individuals were more likely to be downwardly mobile and less likely to be upwardly mobile as compared to heterosexual individuals.

Gender differences

Several differences and nuances emerged when stratifying the analyses by gender. In Chile, the UK and the US, differences in upward-mobility rates between lesbian and heterosexual women were relatively small and statistically insignificant (which supports H5). In Germany, however, higher rates of upward mobility were observed for lesbian women compared to heterosexual women, but not for gay men compared to heterosexual men (contradicting H5). Similar results applied to differences in educational attainment.

Our results for the US are similar to those of Mittleman (2022), who documented higher educational attainment among gay men, but lower educational attainment for (younger cohorts of) lesbian women, as compared to their heterosexual counterparts. Mittleman suggested that gender norms about masculinity may explain gay men's educational premium. Dominant conceptions of masculinity position academic effort as 'feminine' and, in challenging hegemonic masculinity, young gay men may be able to escape the reach of these norms and bolster their educational success (Mittleman, 2022). Yet the reverse may hold true for young lesbian women, for whom challenging gender-typical norms could result in lesser educational efforts (Mittleman, 2018). This proposition resonates with research findings on the reversal in the gender gap in educational attainment (DiPrete and Buchmann, 2013; Legewie and DiPrete, 2012)—especially in combination with our finding that educational-mobility differences are limited to gay men from lower educational backgrounds. The contemporary gender gap in educational attainment favoring women is higher in lower socioeconomic environments, where boys are particularly susceptible to adopting masculine identities involving anti-school attitudes (Legewie and DiPrete, 2012). If anti-school attitudes

are more central to the masculine identities of heterosexual young men from lower socioeconomic strata, challenging hegemonic norms about masculinity can lead to more pronounced differences in academic achievement between heterosexual and gay men from these backgrounds.

Results for Germany, however, cast some doubts over the universality of these claims. In Germany, higher levels of educational attainment and rates of upward mobility were restricted to lesbian women and not observed for gay men. This finding suggests that country context may moderate the relationship between gender, sexual identity and educational outcomes, and that results for the US—where most research has been conducted—cannot be readily extrapolated to other countries. A notable feature of the German context that may explain the difference in findings is that the gender gap in educational attainment still favored men within the sample studied. In fact, heterosexual women in Germany lagged behind other groups, with 35% of them having completed higher education, compared to 45% of heterosexual men, 49% of lesbian women, and 46% of gay men. As a point of comparison, in the UK (similar to the Australia and the US), it was heterosexual men who had the lowest rates of higher-education attainment, at 41% (compared to 50%, 59%, 55% for heterosexual women, lesbian women, and gay men, respectively). In other words, gay men and lesbian women are generally highly educated, but whether they are significantly more educated than their heterosexual counterparts depends on the educational attainment of the latter, which seem to vary more across contexts. This explanation is consistent with the notion that incentives to pursue higher-education options are high for gay/lesbian individuals regardless of country context (due to the pervasiveness of sexual stigma across institutional contexts), yet these incentives vary more for heterosexual individuals (e.g., due to country-level gender or masculinity norms that disincentivize educational attainment).

Institutional context

Our findings invite additional observations regarding the possible influence of institutional context on the educational outcomes of LGB people. In the theoretical section, we discussed mechanisms leading to competing expectations, namely higher or lower educational attainment among LGB people in less stigmatizing contexts. Although higher levels of education and higher rates of upward mobility were observed for gay/lesbian people across countries, effect sizes differed. More specifically, effects were larger in Australia and the US, and weaker in Chile and Germany. It is hard to reconcile these results with these countries' relative levels of discrimination, as the two contexts that would rank highest in stigma based on attitudinal data—Chile and the United States—are on opposite ends of the spectrum. Large confidence intervals and variation in measurement instruments can complicate the comparison of effect sizes across countries using these data, which calls for future research that (i) exploits variation within the same countries over time, or (ii) deploys purposively collected cross-national datasets suitable for multilevel analytic techniques.

A final noticeable difference across countries was the diversity of outcomes for bisexual people. A disadvantageous pattern of intergenerational educational mobility was observed for bisexual men and women in Australia and bisexual men in Germany. This pattern of results was consistent with hypothesis H4, which underscored the additional stigma and stressors faced by bisexual individuals. However, the outcomes of bisexual people differed little from those of heterosexual individuals in the other countries. It is possible that cross-national differences in attitudes towards bisexuality can explain this divergence, which constitutes a question that could be addressed in future research.

As noted earlier, an important area for future inquiry involves fully theorizing and empirically examining the role of additional contextual factors in moderating the relationships between sexual identity and intergenerational educational mobility. For instance, educational

systems differ across countries, and features such as the age of selection into educational tracks might influence the association between sexuality and educational outcomes (Bol & Van de Werfhorst, 2013).

Study limitations

Some study limitations should be borne in mind when interpreting our results. First, our study shares limitations in measuring and operationalizing sexual orientation with other studies in the field based on general social surveys (Mittleman, 2022; Mize, 2016). These include the inability to capture fluidity in people's sexual orientation (Diamond, 2008), particularly during educational careers; overly coarse sexual-identity measures that miss smaller identity groups (Goldberg et al., 2020); non-negligible shares of non-informative responses (Elliott et al., 2019); and reliance on a single dimension of sexual orientation (Mize, 2016). Although an array of sensitivity analyses offered reassurance regarding the validity and reliability of our key findings, future studies should aim to replicate our analyses using more nuanced, longitudinal measures of sexual orientation that go beyond individuals' identity (e.g., encompassing sexual attractions and behavior) and capture sexual identity as individuals navigate their educational careers.

Concluding remarks and implications

We hope that the present study provides a conceptual map for social scientists to further explore the intersections between sexual identity, educational attainment, and social mobility. Our findings have direct implications for an emerging literature aimed at documenting and explaining differences in educational attainment between gay/lesbian, bisexual, and heterosexual people (Black et al., 2000; Mittleman, 2022; Mollborn & Everett, 2015; Verbakel, 2013). We found that gay/lesbian people's higher educational attainment is primarily produced by higher upward mobility among those from lower educational

backgrounds. Such results suggest that explanations for educational differences by sexual identity should focus on the contexts within which individuals from lower educational backgrounds operate.

Our findings also bear implications for principles of equality of opportunity. Overall, they suggest that academic attainment may be a way for LGB youth to invest in self-worth and increase their chances to independently construct their adult lives (Pachankis and Hatzenbuehler, 2013). If this is the case, gay/lesbian people's higher upward mobility rates may be less an indicator of equal opportunities, and more of an adjustment to experiences of early disadvantage. The educational advantages observed in this and other studies (Mittleman, 2022) contrast with studies on the labor market documenting 'pay gaps' that are especially unfavorable for gay men (Mize, 2016; Valfort, 2017). In this regard, there are clear parallels to research on gender inequality: women are now more highly educated than men, but a considerable gender gap in earnings and hourly wages persists (England, 2010). In short, gay/lesbian people are found to be more highly educated than their heterosexual peers, but this could be seen as a response to unequal environments, rather than a sign of equality of opportunity.

More broadly, this study has showcased the need for social-stratification research to engage more seriously with issues of sexual orientation—a socio-demographic trait that has been largely absent from this literature. Sexual orientation is not only a salient socio-demographic feature but, as our results underscore, a trait that can meaningfully alter processes of intergenerational mobility that are core to the field. Failure to recognize that background shapes the status-attainment process in different ways for heterosexual and LGB people can result in an incomplete picture regarding the population groups that are disadvantaged and the processes underpinning their disadvantage.

NOTES

[1] The arguments in this paper may apply to other sexual-minority groups, such as asexual, pansexual, or queer people. However, data limitations mean that we can only study LGB individuals.

[2] These figures are based on the 2005-2009 wave of the World Values Survey using an online tool: https://www.worldvaluessurvey.org/WVSOnline.js (last accessed on 07/04/2021). We combined respondents' highest educational qualification into three groups (less than lower-secondary education completed, secondary educated, and tertiary educated) and tabulated the resulting variable against the question on homosexual (sic) neighbours.

[3] Pooling observations allows us to include individuals who identified as LGB in one, but not all, of their survey responses, or who reported more than one identity (e.g., transitioning from LGB to Other). This recognizes the potential for sexual fluidity. The SOEP data include a booster sample of sexual- and gender-minority individuals added in 2019 (Fischer et al., 2022).

[4] This percentage includes respondents who, by design, were not asked about parental education in UK-HLS.

[5] Most results in Figures 2 and 3 are based on large cell sizes. The lowest cell-sizes are for the upward-mobility analyses of men in Chile (24 bisexual men) and the US (50 bisexual men). For all other countries and groups, the minimum cell sizes are always above 100 individuals.

[6] Pooled models interacting the variables capturing gay/lesbian identity and gender yielded a statistically significant interaction effect for upward mobility in the US, Chile, and Germany. No other interaction effects between any of the sexual-identity and gender variables across countries and mobility measures were statistically significant at the 5% level.

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