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Educational Attainment by Life Course Sexual Attraction: Prevalence and Correlates in a Nationally Representative Sample of Young Adults

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Abstract

Researchers know relatively little about the educational attainment of sexual minorities, despite the fact that educational attainment is consistently associated with a range of social, economic, and health outcomes. We examined whether sexual attraction in adolescence and early adulthood was associated with educational attainment in early adulthood among a nationally representative sample of US young adults. We analyzed Waves I and IV restricted data from the National Longitudinal Study of Adolescent Health (n=14,111). Sexual orientation was assessed using self-reports of romantic attraction in Waves I (adolescence) and IV (adulthood). Multinomial regression models were estimated and all analyses were stratified by gender. Women attracted to the same-sex in adulthood only had lower educational attainment compared to women attracted only to the opposite-sex in adolescence *and* adulthood. Men attracted to the same-sex in adolescence only had lower educational attainment compared to men attracted only to the opposite-sex in adolescence *and* adulthood. Adolescent experiences and academic performance attenuated educational disparities among men and women. Adjustment for adolescent experiences also revealed a suppression effect; women attracted to the same-sex in adolescence and adulthood had lower predicted probabilities of having a high school diploma or less compared to women attracted only to the opposite-sex in adolescence and adulthood. Our findings challenge previous research documenting higher educational attainment among sexual minorities in the US. Additional population-based studies documenting the educational attainment of sexual minority adults are needed.

Keywords

sexual minority; life course; socio-demographics; education

In 2011, the Institute of Medicine released a comprehensive report detailing the state of lesbian, gay, bisexual, and transgender health, including gaps and opportunities for future

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research (Institute of Medicine 2011). Lack of information on the educational attainment of lesbian, gay, and bisexual (LGB) adults and a reliance on non-probability samples to describe demographic characteristics of LGB populations were of particular concern. Given strong evidence that educational attainment is consistently and positively associated with a range of social, economic, and health outcomes, including, for example, a sense of personal control (Mirowsky and Ross 2003; Schieman and Plickert 2008), occupational status (Kerckhoff, Raundenbush, and Glennie 2001), income (Elman and O'Rand 2004; Kerckhoff et al. 2001; Murnane, Willett, and Levy 1995), health (Elo 2009; Lynch 2003; Ross and Wu 1995) and longevity (Elo 2009; Kitagawa and Hauser 1973; Miech et al. 2011; Rogers et al. 2010), it is surprising that so few studies have investigated disparities in educational attainment by sexual orientation. To our knowledge, our study is the first to examine the educational attainment of sexual minorities using a nationally representative sample of US young adults. Our study is also novel in that it applies a life course perspective to identify potential mechanisms through which educational disparities by sexual orientation manifest.

One study that explicitly examined educational attainment among gays and lesbians found that sexual minorities with same-sex partners had higher educational attainment than married heterosexuals (Black et al. 2000). Using the 1990 Census, Black and colleagues (2000) found that among 25 to 34 year olds, approximately 43% of gay partnered men had at least a college degree compared to 24% of married heterosexual men, whereas 47% of lesbian partnered women had at least a college degree compared to 22% of married heterosexual women. Other studies on wage discrimination based on sexual orientation have also reported higher levels of educational attainment among sexual minority persons in bivariate analyses using a variety of population-based data sources (e.g., the General Social Survey, the Current Population Survey, and the California Health Interview Survey) (Berg and Lien 2002; Black et al. 2003; Black, Sanders, and Taylor 2007; Carpenter 2005; Daneshvary, Waddoups, and Wimmer 2008; Elmslie and Tebaldi 2007). All of these studies, however, had limited external validity, as the samples were restricted to cohabitating partners, full-time workers, or both. Thus, a large segment of the LGB population was excluded from prior estimates of educational attainment, potentially leading to biased conclusions about educational disparities by sexual orientation.

Moreover, educational attainment is not merely a marker of human capital, but reflects a dynamic and evolving interaction between individuals and their social environments from childhood through adulthood (Walsemann, Geronimus, and Gee 2008). This follows a life course perspective that posits that childhood and adolescent experiences can result in the accumulation of educational advantages or disadvantages, which over time impact an individual's likelihood of attaining a post-secondary degree (Elman and O'Rand 2007). For example, childhood SES (Cabrera and La Nasa 2001; Ewert 2010; Goldrick-Rab 2006; Grodsky and Jackson 2009), childhood health (Eide and Showalter 2011; Eide, Showalter, and Goldhaber 2010; Haas and Fosse 2008; Jackson 2009), peer victimization (Haas and Fosse 2008; Nishina, Juvonen, and Witkow 2005) and academic performance (Ewert 2010; Jackson 2009; Messersmith and Schulenberg 2008) can have long-term effects on educational careers. Using data from the National Longitudinal Study of Youth (1997), Jackson (2009) found that adolescents who reported poorer health were less likely to graduate from high school by age 19 or attend a 4-year college compared to those who

reported better health. Academic participation and performance were strong mediators of this relationship accounting for 50% of the difference in 4-year college attendance. Others have found that poor psychological functioning decreases school functioning (Nishina et al. 2005) and increases the risk of dropping out of high school (Breslau et al. 2008; Fletcher 2010).

A key driver of the relationship between adolescent health and educational attainment may be experiences of peer victimization during childhood and adolescence. Nishina and colleagues (2005) documented poorer psychological functioning and increased numbers of somatic complaints (e.g., headaches, stomachaches) among middle-schoolers who reported verbal or physical assaults or general harassment. Psychological functioning and somatic complaints were in turn associated with lower school functioning. Haas and Fosse (2008) found that feeling safe in school increased the odds of timely high school graduation and college enrollment, whereas physical altercations decreased the odds. A recent meta-analysis of 33 cross-sectional studies investigating peer victimization and academic functioning demonstrated a significant, negative association; greater peer victimization was associated with poorer academic functioning (Nakamoto and Schwartz 2010).

The relationship between peer victimization, adolescent health, and academic achievement is of particular concern with regard to LGB populations as LGB students are more likely than heterosexual students to miss school because they feel unsafe (Bontempo and D'Augelli 2002; Poteat et al. 2011), be physically threatened (O'Shaughnessy et al. 2004), experience psychological problems (Russell and Joyner 2001), feel marginalized at school, hold lower expectations of attending college, and have lower academic performance (O'Shaughnessy et al. 2004; Pearson, Muller, and Wilkinson 2007; Poteat et al. 2011). From a life course perspective (Elder, Kirkpatrick Johnson, and Crosnoe 2003), such experiences can have life-long consequences for the educational attainment of LGB individuals by decreasing the likelihood of graduating from high school or college (Cabrera, Nora, and Castaneda 1993; Buchmann, DiPrete, and McDaniel 2008; Hearn 1992). As such, adolescents who identify as LGB or are suspected of being LGB may experience a series of events during high school that diminishes academic achievement, resulting in lower educational attainment as compared to heterosexual adolescents. This may also be the case for adolescents who are aware of their same-sex attractions but have not "come out" to their peers, particularly if they perceive that their peers will harass or bully them (Meyer 2003).

Not all LGB adults, however, were aware of their same-sex attractions or exhibited gender atypical behavior (i.e., did not conform to traditional gender roles) as adolescents (Frankowski and The Committee on Adolescence 2004; Jager and Davis-Kean 2011; Saewyc 2011). As a result, these adults may not have experienced harassment or discrimination based on their sexual orientation during high school. By not experiencing these psychosocial stressors during adolescence, the high school academic performance of LGBs who became aware of their same-sex attractions as adults would likely be similar to the academic performance of heterosexuals. Thus, one might expect that their educational attainment would also be similar to heterosexual adults. This expectation is based on the life course concept of timing (Elder et al. 2003), which posits that the impact of a given exposure depends upon when the exposure occurs during the life course. In particular,

exposure to events or experiences during high school has the greatest impact on successful, “on-time” attainment of a post-secondary degree (Elman and O’Rand 2007). Although individuals who become aware of same-sex attractions during college may still experience issues with college persistence and completion, these individuals have already attained a base level of educational attainment – a high school diploma – that those who became aware of their same-sex attractions in high school may not have attained. Thus, it is important to consider how the timing of awareness of same-sex attractions in adolescence and/or early adulthood impacts educational attainment, since the timing might have important effects on individuals’ social and educational trajectories.

Our study advances current LGB research by exploring whether or not life course sexual attraction is associated with educational attainment among a nationally representative sample of US young adults. We chose to use life course sexual attraction as our measure of sexual orientation for two reasons. First, awareness of sexual attraction occurs, *on average*, around age 9 for boys and age 10 for girls, whereas the average age of sexual identification as LGB occurs around age 16 to 17 for girls and boys, respectively (D’Augelli 2006; Herdt and Boxer 1993). Our first assessment of sexual orientation occurs when respondents were 11 to 20 years old; thus, a measure of sexual attraction likely provides a more valid assessment of sexual orientation for our sample than sexual identity given that individuals may not identify as LGB until late adolescence or early adulthood (Savin-Williams 2001). Second, in our study, sexual attraction was measured in adolescence *and* adulthood, whereas sexual identity was only measured in adulthood. By using measures of sexual attraction at both time points, we meet one of the important criteria for longitudinal analysis – measurement consistency (Singer and Willet 2003).

We hypothesize that individuals with same-sex attractions during adolescence will report lower educational attainment in adulthood compared to individuals with only opposite-sex attractions in adolescence *and* adulthood, but that individuals with same-sex attractions in adulthood only will report similar levels of educational attainment as individuals with only opposite-sex attractions in adolescence and adulthood. We also expect that educational disparities will be attenuated with adjustment for adolescent health and experiences, as well as high school academic performance.

METHODS

Sample

We analyzed Wave I (1994/5) and Wave IV (2007/8) restricted data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative sample of adolescents in grades 7–12 in 1994–1995 (Harris et al. 2009). The Add Health sample is representative of US schools with respect to region of country, urbanicity, school size, school type (private/public), and race/ethnicity. Our analysis used data from in-home interviews of respondents in Waves I and IV, as well as data from in-home interviews of parents in Wave I. We restricted our sample to those assigned probability weights in Wave IV (n=14,800). Approximately 688 respondents were excluded due to item non-response on covariates (352 females and 332 males). Most of these exclusions were due to item non-

response on self-reported grades (222 females and 196 males). After exclusions, our final analytic sample consisted of 14,111 respondents (7,516 females and 6,595 males).

We explored potential differences on key demographics between the sample with complete data and the sample that was excluded from our analyses due to item non-response. Among females, older respondents and Hispanics were more likely to have missing data on covariates than younger respondents and whites, whereas females who resided in rural communities at baseline were less likely to have missing data on covariates than females who resided in urban communities at baseline. Among males, older respondents, blacks, and Hispanics were more likely to have missing data on covariates than younger respondents or whites. It is important to note that our overall rate of item non-response (~5%) is quite minimal and is therefore unlikely to result in significant biases in analyses using complete data (Heeringa, West, and Berglund 2010).

Measures

Educational Attainment—Respondents reported their highest level of education along with the type of degrees they had received by Wave IV. We coded respondents as 1=high school diploma or less, 2=some college or Associate’s degree, and 3=Bachelor’s degree or higher. We considered other specifications of this variable (e.g., 8 categories, 4 categories), but our specification yielded substantively similar results and did not suffer from issues of data sparseness.

Life Course Sexual Attraction—In Wave I, respondents were asked, “Have you ever had a romantic attraction to a female? To a male?” In Wave IV, respondents were asked, “Are you romantically attracted to females? To males?” We categorized respondents as 1) attracted only to opposite-sex in youth *and* adulthood, 2) attracted to same-sex in youth, but not adulthood, 3) attracted to same-sex in adulthood, but not youth, 4) attracted to same-sex in youth *and* adulthood, and 5) not attracted to either same- or opposite-sex in youth *or* adulthood. We considered categorizing respondents who did not report a romantic attraction to either sex during adolescence separately from those who reported no romantic attraction to either sex in adulthood, but issues with data sparseness prevented us from doing so. Sensitivity analyses, however, suggested that these groups experienced similar levels of educational attainment. As a result, individuals who reported no attraction to either sex in youth and adulthood are included in the same category as individuals who reported no attraction to either sex in youth only as well as individuals who reported no attraction to either sex in adulthood only. Further, again due to issues of data sparseness, we were unable to disaggregate individuals attracted to both sexes (i.e., bisexual attractions) from individuals attracted only to the same sex.

Adolescent health at Wave I—We include a number of indicators assessing the health and health behaviors of respondents at Wave I in order to assess the extent to which adolescent health and health behaviors mediate the relationship between sexual attraction and educational attainment. *Self-rated health* was assessed using the following question: “In general, how is your health? Would you say excellent, very good, good, fair, or poor?” Higher values reflect better health. We measured *depressive symptoms* using the 19-item

Center for Epidemiological Studies Depression Scale (CES-D) available in Add Health. Respondents were asked how often in the past week they had experienced any of 19 symptoms. Per convention, positively worded items were reverse coded and the 19 items were summed (Cronbach's $\alpha=0.86$). Values ranged from 0 to 56. We measured *somatic symptoms* using 12 indicators of physical symptoms (i.e., headache, feeling hot, stomachache, cold sweats, weakness, feeling sick, wake up tired, dizziness, chest pains, aches or pains, trouble falling asleep, and trouble relaxing). Respondents were asked how often they experienced any of these symptoms in the past 12 months (0=never, 4=everyday). Scores on the summated scale ranged from 0 to 41 (Cronbach's $\alpha=0.77$). We measured *victimization* if in the past 12 months respondents experienced any of the following: (1) someone pulled a knife or gun on them; (2) they were shot or stabbed; or (3) they were jumped.

Adolescent Academic Performance and Expectations—Because LGB adolescents may experience greater harassment and discrimination at school due to their sexual orientation, their academic performance may suffer. Thus, we include indicators of academic performance and expectations measured at Wave I to assess the extent to which adolescent academic performance and expectations mediate the relationship between sexual attraction and educational attainment. We measured *difficulties in school* using four items. Respondents were asked how often during the 1994–5 school year they had trouble getting along with teachers, paying attention in school, getting homework done, and getting along with students (0=never, 4=everyday). Scores on the summated scale ranged from 0 to 16 (Cronbach's $\alpha=0.69$). *Academic expectations* were assessed using the following question: “On a scale of 1 to 5, where 1 is low and 5 is high, how likely is it that you will go to college?” We coded respondents as having high expectations if they reported a 4 or 5 on the scale. We calculated respondents' *grade point average* (GPA) in the most recent grading period by averaging their grades (using a 4-point scale, where 1=D or lower, 2=C, 3=B, 4=A) in English, mathematics, history or social science, and science. Values ranged from 1 to 4.

Socio-demographics—We include a number of covariates that have been associated with educational attainment in prior research (Buchmann et al. 2008; Cabrera and LaNasa 2001; Goldrick-Rab 2006). We categorized self-reported *race/ethnicity* as non-Hispanic white, non-Hispanic black, Hispanic, or other race/ethnicity. We categorized respondents as *immigrants* if they reported being born outside of the US to non-US citizens. *Age* in Wave IV ranged from 24 to 34 years old. *Family structure* in Wave I was categorized as nuclear (two biological parents), step-family (one biological and one step-parent), female-headed, extended/intergenerational family, and other. We also include *region* of the country (West, Midwest, South, or Northeast) where the respondent resided in Wave I, as well as *urbanicity* in Wave I (urban, rural, or suburban). Finally, we constructed a composite measure of *family SES* because multivariate indices of SES are more reliable than single-item measures and doing so reduced issues with item-missingness. Family SES was calculated as the mean of standardized (z-score) measures of family poverty, parental education, and parental occupation. The composite score was calculated for all respondents who had information on at least one of the indicators used in the composite measure. Unemployed and stay-at-home

parents did not report an occupational status. If the respondent resided with one parent, information for the one parent was used. If the respondent resided with two parents, the average of both parents' information was calculated. Positive values represented higher levels of SES (Cronbach's $\alpha=0.66$).

Analytic Approach

Given that women often show greater fluidity in their sexuality and some women become aware of their romantic attractions significantly later in the life course compared to men (Diamond 1998; Diamond 2000; Diamond 2012; Floyd and Bakeman 2006; Floyd and Stein 2002; Savin-Williams 2001; Savin-Williams and Diamond 2000), all analyses were gender stratified. We began with descriptive statistics to understand data distribution. Next, we examined bivariate associations between selected characteristics and life course sexual attraction. We used multinomial logit regression to examine the association between life course sexual attraction and educational attainment, rather than the more commonly used ordered logit regression because ordered logit regression assumes that the explanatory variables have the same effect on the outcome across all levels of the outcome (Hardin and Hilbe 2012). This assumption was not met with our data. We report predicted probabilities and marginal effects rather than relative risks in our multinomial logit regression models as predicted probabilities and marginal effects provide easily understood measures that can be used to compare risk across population groups. We weighted all analyses to adjust for Add Health's sampling design and respondent attrition using the *svy* command in Stata v12. Predicted probabilities and marginal effects were calculated using the *margins* command in Stata v12.

Sensitivity Analyses

We ran a set of sensitivity analyses to determine if results were being driven by model specification. These analyses included baseline measures of suicidal ideation, engagement in risky health behaviors (i.e., smoking, binge drinking, illicit drug use), engagement in delinquent behaviors, feelings of school belonging, and parental support. Results from these analyses did not alter our inferences. Moreover, these covariates were unrelated to educational attainment in multivariate models. Given issues of parsimony and to retain sample size, we chose to exclude these variables from our final models.

RESULTS

Sample Characteristics

Table 1 presents sample characteristics by gender. Among females, 35% attained at least a Bachelor's degree by Wave IV, whereas 28.5% had attained a high school diploma or less. Over 76% reported attraction only to males in youth and adulthood, 3.5% reported attraction to females in youth, but not adulthood, 8% reported attraction to females in adulthood, but not youth, and 1.4% reported attraction to females in youth and adulthood. On average, female students reported good to very good health ($M = 3.8$), the majority held expectations to attend college (79.9%), and the average GPA in the last academic term was 2.9.

Among males, approximately 28% attained at least a Bachelor's degree by Wave IV, whereas 38.9% attained a high school diploma or less. Over 76% reported attraction only to females in youth and adulthood, 6.1% reported attraction to males in youth, but not adulthood, 3.1% reported attraction to males in adulthood, but not youth, and 1% reported attraction to males in youth and adulthood. On average, male students reported very good health ($M = 4.0$), the majority held expectations to attend college (71.9%), and the average GPA in the last academic term was 2.7.

Bivariate Analysis

Table 2 presents selected bivariate associations between sample characteristics and life course sexual attraction, separately for females and males. Among females, educational attainment varied by life course sexual attraction, with women who had consistent attractions in youth and adulthood (to the opposite-sex or to the same-sex) experiencing similarly high levels of educational attainment. That is, approximately 38% of women attracted only to the opposite-sex in youth and adulthood as well as 38% of women attracted to the same-sex in youth and adulthood had a college degree, whereas 21.5% of women attracted to the same-sex in adulthood only had attained a college degree. Those without romantic attractions in youth or adulthood also had lower rates of attaining a college degree (26.2%) compared to women attracted only to the opposite-sex in youth and adulthood. Significant differences by life course sexual attraction were also noted for all key covariates. In general, these findings suggest that women with same-sex attractions as adults had poorer adolescent health and greater difficulties in school than women with only opposite-sex attractions in youth and adulthood.

Among males, we found significant differences by life course sexual attraction across all covariates presented in Table 2 except for race/ethnicity and self-rated health. Men attracted to the same-sex only in youth had lower educational attainment compared to men attracted only to the opposite-sex in adolescence and adulthood (50.5% vs. 35.9% had a high school diploma or less). Similar rates of low education were found among men without romantic attractions in youth or adulthood (52.9%). Additionally, 36.5% of men who reported attraction to the same-sex in youth only had been victimized in the year prior to baseline compared to 28.3% of men who reported attraction only to the opposite-sex in youth and adulthood.

Multinomial Logit Regression Analyses

We present weighted estimates of predicted probabilities and marginal effects for females in Table 3. Our model building approach allowed us to test our two hypotheses. In Model 1, we examined the effects of life course sexual attraction on educational attainment, with adjustment for socio-demographic covariates. We ran two additional models that adjusted for adolescent health and experiences in Wave I (Model 2) and academic performance and expectations in Wave I (Model 3) to test our hypotheses that educational disparities by life course sexual attraction would be attenuated after adjustment for these covariates. Estimates represent average predicted probabilities, as all covariates were centered at their grand means.

Among females, those who were attracted to the same-sex in adulthood only had lower educational attainment than women who were attracted only to the opposite-sex in youth and adulthood (Model 1). Specifically, the predicted probability of having a high school diploma or less was significantly greater for women attracted to the same-sex in adulthood only compared to women attracted only to the opposite-sex in youth and adulthood (PP=0.37 versus PP=0.24, respectively). Women who reported no attraction to either sex in youth or adulthood also had a higher predicted probability of having a high school diploma or less compared to women attracted only to the opposite-sex in youth and adulthood (PP=0.34 versus PP=0.24, respectively). Women who were attracted to the same-sex in youth only reported similar levels of educational attainment as women attracted only to the opposite-sex in youth and adulthood.

Adjustment for adolescent health and experiences at Wave I (Model 2) and academic performance and expectations at Wave I (Model 3) attenuated, but did not eliminate, differences in the predicted probabilities of having a high school diploma or less and having a Bachelor's degree or higher between women attracted to the same-sex in adulthood only and women attracted only to the opposite-sex in youth and adulthood. For example, the gap in the predicted probabilities of attaining a college degree between these two groups narrowed from -0.14 in Model 1 to -0.10 in Model 3, but the gap was still statistically significant in Model 3. Statistically significant differences in predicted probabilities found between women who reported no attraction in youth or adulthood and women attracted only to the opposite-sex in youth and adulthood remained across Models 2 and 3.

We also found that adjustment for adolescent health and experiences at Wave I (Model 2) resulted in a statistically significantly lower predicted probability of having a high school diploma or less among women with same-sex attractions in youth and adulthood (PP=0.15) compared to women attracted only to the opposite-sex in youth and adulthood (PP=0.24). The gap in predicted probabilities between these two groups remained significant after further adjustment for academic performance and expectations at Wave I (Model 3).

We present weighted estimates of predicted probabilities and marginal effects for males in Table 4. Among males, those who were attracted to the same-sex in youth only had a higher predicted probability (PP=0.48) of having a high school diploma or less and a lower predicted probability of having some college or an Associate's degree (PP=0.31) than men who were attracted only to the opposite-sex in youth and adulthood (PP=0.36 and PP=0.39, respectively, Model 1). Similar results were found for men who reported no attraction to either sex in youth or adulthood. Additionally, men who reported no attraction to either sex in youth or adulthood also had a lower predicted probability of having a Bachelor's degree or higher (PP=0.17) than men who were attracted only to the opposite-sex in youth and adulthood (PP=0.25).

Adjustment for adolescent health and experiences at Wave I (Model 2) attenuated the differences in predicted probabilities of having a high school diploma or less between men who were attracted to the same-sex in youth only and men who were attracted only to the opposite-sex in youth and adulthood. Specifically, the difference in predicted probabilities between these two groups was 0.12 in Model 1 and 0.09 in Model 2. Adjustment for

academic performance and expectations at Wave I (Model 3) resulted in a non-significant difference in predicted probabilities between these groups ($PP_{yo}-PP_{oppsex}=0.08$, ns) as well as a non-significant difference in predicted probabilities of attaining a high school diploma or less between men who reported no attraction to either sex in youth or adulthood and men who were attracted only to the opposite-sex in youth and adulthood ($PP_{noattract}-PP_{oppsex}=0.13$, ns). The lower predicted probabilities of having some college or Associate's degree or of having a Bachelor's degree or higher found for men who reported no attraction to either sex in youth or adulthood as compared to men who were attracted only to the opposite-sex in youth and adulthood were not attenuated in Models 2 or 3.

DISCUSSION

Educational attainment is a key determinant of social, economic, and health conditions across the life course. As such, lack of valid and reliable estimates of LGB educational attainment has significant implications for the ability of social scientists and demographers to understand the characteristics and experiences of the LGB population. Our study is one of the first to describe the educational attainment of the LGB young adult population and examine the potential mechanisms through which educational disparities by sexual orientation manifest. We had 3 hypotheses: 1) individuals with same-sex attractions during adolescence would report lower educational attainment in adulthood compared to individuals with only opposite-sex attractions in adolescence *and* adulthood; 2) individuals with same-sex attractions in adulthood only would report similar levels of educational attainment as individuals with only opposite-sex attractions in adolescence *and* adulthood; and 3) educational disparities would be attenuated with adjustment for adolescent health and experiences, as well as high school academic performance. We found support for all three hypotheses among men, but some of our findings ran counter to our hypotheses among women.

Women who were attracted to the same-sex in adolescence had similar levels of educational attainment as women who were attracted only to men in adolescence and adulthood. However, women attracted to the same-sex in adulthood only had lower educational attainment compared to women attracted only to the opposite-sex in adolescence *and* adulthood; that is, they were more likely to have a high school diploma or less and were less likely to have a Bachelor's degree or higher than women attracted only to the opposite-sex in adolescence and adulthood. Adjustment for adolescent experiences and academic performance reduced, but did not fully attenuate, these educational disparities.

These findings may be related to gender differences in the timing at which developmental milestones related to individuals' sexuality are reached, including the age when one becomes aware of same-sex attractions, engages in same-sex behaviors, and self-identifies as lesbian or bisexual. For example, women, unlike men, often experience same-sex attractions and identities in response to a single intimate relationship with another woman during late adolescence or early adulthood (Diamond 2012; Floyd and Stein 2002). Completing these developmental milestones during the transition to adulthood, a time when individuals must choose whether or not to attend post-secondary school, may be associated with less social support (Needham and Austin 2010), fewer role models (Floyd and

Bakeman 2006), and higher rates of psychosocial stress (Rankin 2003), all of which may hamper individuals from achieving their educational goals. Indeed, young adults often rely on their parents for financial resources (Valentine, Skelton, and Butler 2003); this may be particularly true for young adults attending college. Disclosing one's sexual orientation to parents while in college may lead to the withdrawal of financial (Valentine et al. 2003) or emotional support from parents (Needham and Austin 2010), resulting in a disruption of the student's educational pursuits. Delayed entry into college and disrupted educational careers reduce the likelihood that one will complete a college degree (Buchmann et al. 2008; Ewert 2010; Goldrick-Rab 2006). Although we were unable to test these potential pathways with our data, future research should consider how the timing and self-disclosure of same-sex attraction impacts the educational attainment of lesbian and bisexual women.

In models adjusting only for socio-demographics, we found that women with same-sex attractions in adolescence and adulthood reported similar levels of educational attainment as women with opposite-sex attractions in adolescence and adulthood. Once we adjusted for adolescent health and experiences, women with same-sex attractions in adolescence and adulthood were less likely than women with opposite-sex attractions in adolescence and adulthood to have attained a high school diploma or less, a finding that held with further adjustment for academic performance. The greater prevalence of adolescent health problems, victimization, and difficulties in school experienced by women with same-sex attractions in adolescence and adulthood as compared to women with opposite-sex attractions in adolescence and adulthood, likely concealed their lower risk of attaining a high school diploma or less, which corresponds to our hypothesis that adolescent health and academic performance would explain educational disparities by life course sexual attraction.

As expected, among men, we found that same-sex attraction in adolescence only was associated with lower educational attainment, whereas same-sex attraction in adulthood only was not. Because boys, in general, become aware of same-sex attractions, engage in same-sex behaviors, and come out to friends and family at earlier ages than girls, adolescent boys who are attracted to the same-sex may be at greater risk of experiencing poor educational outcomes due to the challenges they often face within their schools and families (O'Shaughnessy et al. 2004; Pearson et al. 2007; Poteat et al. 2011). Our results lend support for such a conclusion; after adjustment for adolescent health, victimization, difficulties in school, and academic performance, men attracted to the same-sex in adolescence only experienced similar levels of educational attainment as men attracted only to the opposite-sex in adolescence *and* adulthood. Interestingly, men with same-sex attractions in adolescence *and* adulthood experienced similar levels of educational attainment as men who maintained opposite-sex attractions, regardless of the covariates included in the model. Perhaps they were more likely to seek and obtain acceptance for their same-sex attractions during adolescence as compared to men attracted to the same-sex in adolescence only. Further research on resilience and identity development is required to confirm or challenge this supposition.

Our findings also suggest gender differences in the underlying processes linking life course sexual attraction and educational attainment. Perhaps the psychosocial environments of girls who report same-sex attractions in adolescence as compared to boys who report same-sex

attractions in adolescence vary. For example, studies have found that adolescent boys are more prejudiced towards sexual minority youth than adolescent girls (Baker and Fishbein 1998; Poteat, Espelage, and Koenig 2009). This may result in adolescent boys with same-sex attractions experiencing more stigma and discrimination than their female counterparts, which may in turn negatively impact their academic performance in high school more so than same-sex attracted girls. Conversely, women who become aware of their same-sex attractions as adults may exhibit different characteristics (e.g., lower sense of personal control, lower self-efficacy) or be exposed to less supportive family environments as compared to girls who become aware of their same-sex attractions as adolescents. These differences may also be related to academic performance and educational attainment (Cutrona et al. 1994; Fass and Tubman 2002). Examining these potential underlying processes was beyond the scope of our data, but given our findings, they warrant more intensive consideration in future research.

Prior studies using national data report higher educational attainment among LGB individuals (Berg and Lien 2002; Black et al. 2000; Black et al. 2003; Black et al. 2007; Carpenter 2005; Daneshvary et al. 2008; Elmslie and Tebaldi 2007). Although bivariate results suggest that this might be the case in our sample for men who report same-sex attraction only in adulthood, these findings did not hold in multivariate analyses. Most of these past studies, however, defined a person as LGB if they were cohabitating with a same-sex partner. This group is unlikely to be representative of all LGB populations. For example, LGBs who are cohabitating with same-sex partners may be younger than LGBs who are not – especially in the early 1990's when social mores were more conservative than they are now (Loftus 2001). Given the changing distribution of educational attainment that occurred in the United States during the 20th century (Carlson 2008; US Census Bureau 2012), the higher levels of educational attainment found among LGBs in the studies that used data from the 1990s may, in part, reflect age and cohort effects. Further, many of these studies also restrict analyses to full-time workers. Because educational attainment and employment status are highly correlated, this further restriction (cohabitating plus working) may have biased estimates of educational attainment upward.

Overall, our findings lend support to the importance of taking a life course perspective when examining the relationship between sexual minority status and educational attainment. First, a life course perspective recognizes that the effect of a given event or exposure may depend on the *timing* of that event or exposure (Elder et al 2003). Our results provide evidence that the timing of awareness of same-sex attraction matters for educational attainment, and that it might matter differently for males and females. Second, our findings support the proposition that the accumulation of educational advantages and disadvantages during adolescence impacts educational attainment and that this process is, in part, a mechanism through which sexual minority adolescent males experience lower educational attainment.

Additional research that considers sexual attraction to both sexes and other dimensions of sexual orientation, particularly sexual identity, at various points in the life course is needed to gain a better understanding of the socio-demographic characteristics of the LGB population. Moreover, research is needed on the experiences of individuals reporting no sexual attractions, as they also reported lower educational attainment than individuals with

opposite-sex attractions only. Whereas the number of individuals reporting no sexual attractions or identifying as “asexual” has grown in recent years, asexuality remains a relatively new sexual identity about which a paucity of research exists (Prause and Graham 2007; Scherrer 2008). As a result, legitimization of asexuality as a sexual identity is lacking, as may be social acceptance from family and community members; all of which may negatively impact educational outcomes (Bogaert 2004; Prause and Graham 2007; Scherrer 2008). Investigation into these issues is needed to validate or challenge these suppositions. Lastly, future research should include transgender populations and should explore how issues of gender identity, gender atypicality, and timing of gender transitioning during adolescence and/or adulthood are associated with educational attainment.

Limitations

Our sample represents individuals who were attending grades 7–12 in 1994–1995; thus, inferences should only be made to this population. To our knowledge, however, this is the first study to use a nationally representative sample to describe the educational attainment of LGB young adults and to understand the correlates associated with educational disparities between LGB and heterosexual young adults. Given the age of our sample at baseline and the consistency in which measures of sexual orientation were collected, we relied on romantic attraction as our measure of sexual orientation, which represents only one dimension of sexual orientation. Attraction, however, is considered the defining feature of sexual orientation (Diamond 2005; Levine 2003; Leiblum and Rosen 1988), and is likely the most appropriate measure to use when studying adolescents. However, some level of misclassification may have occurred in our study, particularly among respondents who were younger at Wave I and who had not yet become aware of their same-sex attractions until later in adolescence. Finally, the number of individuals who reported romantic attractions to the same-sex ranged in size from 70 to 575 when gender stratified, which likely reduced our ability to detect significant differences. As such, we were unable to distinguish individuals who reported attraction to both sexes from those who reported same-sex attraction only.

Conclusions

Our findings challenge results from prior studies documenting higher educational attainment among sexual minorities in the US. Rather, we found that educational attainment differs by life course sexual attraction; women attracted to the same-sex in adulthood only, men attracted to the same-sex in youth only, and both men and women reporting no sexual attractions in youth or adulthood had lower educational attainment compared to respondents attracted to only the opposite-sex in youth and adulthood. Additional information about the socio-demographics of the LGB population using representative samples, as well as identification of the mechanisms driving the social stratification of the LGB population, is imperative as it may ultimately lead to the development of effective policies targeted at addressing these key forms of social stratification.

References

- Baker JG, Fishbein HD. The development of prejudice towards gays and lesbians by adolescents. *Journal of Homosexuality*. 1998; 36(1):89–100. [PubMed: 9670103]

- Berg N, Lien D. Measuring the effect of sexual orientation on income: Evidence of discrimination? *Contemporary Economic Policy*. 2002; 20(4):394–414.
- Black D, Gates G, Sanders SG, Taylor L. Demographics of the gay and lesbian population in the United States: Evidence from available systematic data sources. *Demography*. 2000; 37(2):139–154. [PubMed: 10836173]
- Black D, Makar HR, Sanders SG, Taylor LJ. The earnings effects of sexual orientation. *Industrial & Labor Relations Review*. 2003; 56(3):449–469.
- Black DA, Sanders SG, Taylor L. The economics of lesbian and gay families. *Journal of Economic Perspectives*. 2007; 21(2):53–70.
- Bogaert A. Asexuality: Prevalence and associated factors in a national probability sample. *Journal of Sex Research*. 2004; 41(3):279–288. [PubMed: 15497056]
- Bontempo DE, D’Augelli AR. Effects of at-school victimization and sexual orientation on lesbian, gay, or bisexual youths’ health risk behavior. *Journal of Adolescent Health*. 2002; 30(5):364–374. [PubMed: 11996785]
- Breslau J, Lane M, Sampson N, Kessler RC. Mental disorders and subsequent educational attainment in a US national sample. *Journal of Psychiatric Research*. 2008; 42(9):708–716. [PubMed: 18331741]
- Buchmann C, DiPrete TA, McDaniel A. Gender inequalities in education. *Annual Review of Sociology*. 2008; 34(1):319–337.
- Cabrera AF, La Nasa SM. On the path to college: Three critical tasks facing America’s disadvantaged. *Research in Higher Education*. 2001; 42(2):119–149.
- Cabrera A, Nora A, Castaneda M. College persistence: Structural equations modeling test of an integrated model of student retention. *Journal of Higher Education*. 1993; 64(2):123–139.
- Carlson, E. *The lucky few: Between the greatest generation and the baby boom*. London: Springer; 2008.
- Carpenter CS. Self-reported sexual orientation and earnings: Evidence from California. *Industrial & Labor Relations Review*. 2005; 58(2):258–273.
- Cutrona CE, Cole V, Colangelo N, Assouline SG, Russell DW. Perceived parental social support and academic achievement: An attachment theory perspective. *Journal of Personality and Social Psychology*. 1994; 66(2):369–378. [PubMed: 8195992]
- Daneshvary N, Waddoups C, Wimmer B. Educational attainment and the lesbian wage premium. *Journal of Labor Research*. 2008; 29(4):365–379.
- D’Augelli, A. Developmental and contextual factors and mental health among lesbian, gay, and bisexual youths. In: Omoto, AM.; Kurtzman, HS., editors. *Sexual orientation and mental health: Examining identity and development in lesbian, gay, and bisexual people*. Washington D.C: American Psychological Association; 2006. p. 37-53.
- Diamond LM. Development of sexual orientation among adolescent and young adult women. *Developmental Psychology*. 1998; 34(5):1085–1095. [PubMed: 9779753]
- Diamond LM. Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental Psychology*. 2000; 36(2):241–250. [PubMed: 10749081]
- Diamond LM. Toward greater specificity in modeling the ecological context of desire. *Human Development*. 2005; 48(5):291–297.
- Diamond LM. The desire disorder in research on sexual orientation in women: Contributions of dynamical systems theory. *Archives of Sexual Behavior*. 2012; 41(1):73–83. [PubMed: 22278028]
- Eide ER, Showalter MH. Estimating the relation between health and education: What do we know and what do we need to know? *Economics of Education Review*. 2011; 30:778–791.
- Eide ER, Showalter MH, Goldhaber DD. The relation between children’s health and academic achievement. *Children and Youth Services Review*. 2010; 32(2):231–238.
- Elder, GH.; Kirkpatrick Johnson, M.; Crosnoe, R. The emergence and development of life course theory. In: Mortimer, J.; Shanahan, MJ., editors. *Handbook of the life course*. New York, NY: Springer; 2003. p. 3-19.
- Elman C, O’Rand AM. The race is to the swift: Socioeconomic origins, adult education, and wage attainment. *American Journal of Sociology*. 2004; 110(1):123–160.

- Elman C, O'Rand A. The effects of social origins, life events, and institutional sorting on adults' school transitions. *Social Science Research*. 2007; 36(3):1276–99.
- Elmslie B, Tebaldi E. Sexual orientation and labor market discrimination. *Journal of Labor Research*. 2007; 28(3):436–453.
- Elo IT. Social class differentials in health and mortality: Patterns and explanations in comparative perspective. *Annual Review of Sociology*. 2009; 35:553–72.
- Ewert S. Male and female pathways through four-year colleges: Disruption and sex stratification in higher education. *American Educational Research Journal*. 2010; 47(4):744–773.
- Fass ME, Tubman JG. The influence of parental and peer attachment on college students' academic achievement. *Psychology in the Schools*. 2002; 39(5):561–573.
- Fletcher JM. Adolescent depression and educational attainment: results using sibling fixed effects. *Health Economics*. 2010; 19(7):855–871. [PubMed: 19582699]
- Floyd F, Bakeman R. Coming-out across the life course: Implications of age and historical context. *Archives of Sexual Behavior*. 2006; 35(3):287–296. [PubMed: 16804747]
- Floyd FJ, Stein TS. Sexual orientation identity formation among gay, lesbian, and bisexual youths: Multiple patterns of milestone experiences. *Journal of Research on Adolescence*. 2002; 12(2):167–191.
- Frankowski BL. the Committee on Adolescence. Sexual orientation and adolescents. *Pediatrics*. 2004; 113(6):1827–1832. [PubMed: 15173519]
- Goldrick-Rab S. Following their every move: An investigation of social-class differences in college pathways. *Sociology of Education*. 2006; 79(1):67–79.
- Grodsky E, Jackson E. Social stratification in higher education. *Teachers College Record*. 2009; 111(10):2347–2384.
- Haas SA, Fosse NE. Health and the educational attainment of adolescents: Evidence from the NLSY97. *Journal of Health and Social Behavior*. 2008; 49(2):178–192. [PubMed: 18649501]
- Harris, KM.; Halpern, CT.; Whitsel, E.; Hussey, J.; Tabor, J.; Entzel, P.; Udry, JR. *The National Longitudinal Study of Adolescent Health: Study Design*. Chapel Hill: Carolina Population Center, University of North Carolina at Chapel Hill; 2009. Retrieved from <http://www.cpc.unc.edu/projects/addhealth/design>
- Hearn JC. Emerging variations in postsecondary attendance patterns: An investigation of part-time, delayed, and nondegree enrollment. *Research in Higher Education*. 1992; 33(6):657–687.
- Heeringa, SG.; West, BT.; Berglund, PA. *Applied survey data analysis*. Boca Rotan, FL: Chapman & Hall/CRC Press; 2010.
- Herd, G.; Boxer, A. *Children of horizons: How gay and lesbian teens are leading a new way out of the closet*. Boston, MA: Beacon Press; 1993.
- Institute of Medicine, Committee on Lesbian, Gay, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities; Board on the Health of Select Populations. *The health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding*. Washington, DC: The National Academies Press; 2011.
- Jackson MI. Understanding links between adolescent health and educational attainment. *Demography*. 2009; 46(4):671–694. [PubMed: 20084824]
- Jager J, Davis-Kean PE. Same-sex sexuality and adolescent psychological well-being: The influence of sexual orientation, early reports of same-sex attraction, and gender. *Self Identity*. 2011; 10(4):417–444. [PubMed: 22505839]
- Kerckhoff AC, Raudenbush SW, Glennie E. Education, cognitive skill, and labor force outcomes. *Sociology of Education*. 2001; 74(1):1–24.
- Kitagawa, EM.; Hauser, PM. *Differential mortality in the United States: A study in socioeconomic epidemiology*. Cambridge, MA: Harvard University Press; 1973.
- Leiblum, S.; Rosen, R. Introduction: changing perspectives on sexual desire. In: Leiblum, S.; Rosen, R., editors. *Sexual desire disorders*. New York: Guilford Press; 1988. p. 1-17.
- Levine SB. The nature of sexual desire: A clinician's perspective. *Archives of Sexual Behavior*. 2003; 32(3):279–285. [PubMed: 12807300]

- Loftus J. America's liberalization in attitudes toward homosexuality, 1973 to 1998. *American Sociological Review*. 2001; 66(5):762–782.
- Lynch SM. Cohort and life course patterns in the relationship between education and health: A hierarchical approach. *Demography*. 2003; 40(2):309–333. [PubMed: 12846134]
- Messersmith EE, Schulenberg JE. When can we expect the unexpected? Predicting educational attainment when it differs from previous expectations. *Journal of Social Issues*. 2008; 64(1):195–212.
- Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*. 2003; 129(5):674–697. [PubMed: 12956539]
- Miech R, Pampel F, Kim J, Rogers RG. The enduring association between education and mortality. *American Sociological Review*. 2011; 76(6):913–934.
- Mirowsky, J.; Ross, CE. *Education, social status, and health*. Hawthorne, NY: Aldine de Gruyter; 2003.
- Murnane R, Willett JB, Levy F. The growing importance of cognitive skills in wage determination. *Review of Economics and Statistics*. 1995; 77:251–266.
- Nakamoto J, Schwartz D. Is peer victimization associated with academic achievement? A meta-analytic review. *Social Development*. 2010; 19(2):221–242.
- Needham B, Austin E. Sexual orientation, parental support, and health during the transition to young adulthood. *Journal of Youth and Adolescence*. 2010; 39(10):1189–1198. [PubMed: 20383570]
- Nishina A, Juvonen J, Witkow MR. Sticks and stones may break my bones, but names will make me feel sick: The psychosocial, somatic, and scholastic consequences of peer harassment. *Journal of Clinical Child & Adolescent Psychology*. 2005; 34(1):37–48. [PubMed: 15677279]
- O'Shaughnessy, M.; Russell, S.; Heck, K.; Calhoun, C.; Laub, C. *Safe place to learn: Consequences of harassment based on actual or perceived sexual orientation and gender nonconformity and steps for making schools safer*. Davis, CA: University of California, Davis; 2004.
- Pearson J, Muller C, Wilkinson L. Adolescent same-sex attraction and academic outcomes: The role of school attachment and engagement. *Social Problems*. 2007; 54(4):523–542. [PubMed: 20221417]
- Poteat V, Espelage DL, Koenig BK. Willingness to remain friends and attend school with lesbian and gay peers: Relational expressions of prejudice among heterosexual youth. *Journal of Youth and Adolescence*. 2009; 38(7):952–962. [PubMed: 19636738]
- Poteat VP, Mereish EH, DiGiovanni CD, Koenig BW. The effects of general and homophobic victimization on adolescents' psychosocial and educational concerns: The importance of intersecting identities and parent support. *Journal of Counseling Psychology*. 2011; 58(4):597–609. [PubMed: 21859187]
- Prause N, Graham C. Asexuality: Classification and characterization. *Archives of Sexual Behavior*. 2007; 36:341–356. [PubMed: 17345167]
- Rankin, SR. *Campus climate for gay, lesbian, bisexual, and transgender people: A national perspective*. New York, NY: The National Gay and Lesbian Task Force Policy Institute; 2003.
- Rogers RG, Everett BG, Zajacova A, Hummer RA. Educational degrees and adult mortality risk in the United States. *Biodemography and Social Biology*. 2010; 56:80–99. [PubMed: 20589989]
- Ross CE, Wu CL. The links between education and health. *American Sociological Review*. 1995; 60(5):719–745.
- Russell ST, Joyner K. Adolescent sexual orientation and suicide risk: Evidence from a national study. *American Journal of Public Health*. 2001; 91(8):1276–1281. [PubMed: 11499118]
- Saewyc EM. Research on adolescent sexual orientation: Development, health disparities, stigma, and resilience. *Journal of Research on Adolescence*. 2011; 21(1):256–272.
- Savin-Williams RC. A critique of research on sexual-minority youths. *Journal of Adolescence*. 2001; 24(1):5–13. [PubMed: 11259066]
- Savin-Williams RC, Diamond LM. Sexual identity trajectories among sexual-minority youths: Gender comparisons. *Archives of Sexual Behavior*. 2000; 29(6):607–627. [PubMed: 11100265]
- Scherrer K. Coming to an asexual identity: Negotiating identity, negotiating desire. *Sexualities*. 2008; 11(5):621–641. [PubMed: 20593009]

- Schieman S, Plickert G. How knowledge is power: Education and the sense of control. *Social Forces*. 2008; 87(1):153–83.
- Singer, JD.; Willet, JB. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. New York: Oxford University Press, Inc; 2003.
- US Census Bureau. CPS Historical Time Series Table: Table A-1. Years of School Completed by People 25 Years and Over, by Age and Sex: Selected Years 1940 to 2012. 2012. <http://www.census.gov/hhes/socdemo/education/data/cps/historical/index.html>
- Valentine G, Skelton T, Butler R. Coming out and outcomes: Negotiating lesbian and gay identities with, and in, the family. *Environment and Planning D: Society and Space*. 2003; 21:479–499.
- Walsemann KM, Geronimus AT, Gee GC. Accumulating disadvantage over the life course: Evidence from a longitudinal study investigating the relationship between educational advantage in youth and health in middle-age. *Research on Aging*. 2008; 30(2):169–199.

Table 1

Sample Characteristics of Respondents by Gender, Weighted Data, Add Health, Waves I and IV

	Females N=7,516 % or Mean (SE)	Males N=6,595 % or Mean (SE)
<u>Educational Attainment</u> (Wave IV)		
High School Diploma or Less	28.5	38.9
Some College or Associate's Degree	36.5	33.3
Bachelor's Degree or Higher	35.0	27.9
<u>Life Course Sexual Attraction</u>		
Opposite-Sex Youth & Adult	76.6	76.4
Same-Sex Youth	3.5	6.1
Same-Sex Adult	8.0	3.1
Same-Sex Youth & Adult	1.4	1.0
Not Sexually Attracted Youth or Adult	10.4	13.4
<u>Socio-Demographics</u>		
<u>Race/Ethnicity</u>		
Non-Hispanic White	68.0	68.3
Non-Hispanic Black	16.0	14.9
Hispanic	11.5	11.6
Other Race/Ethnicity	4.5	5.3
Foreign-Born	4.2	4.3
Age in 2008 (years)	28.7 (0.12)	28.9 (0.12)
<u>Family Structure</u> (Wave I)		
Nuclear	47.6	49.6
Step-Family	9.0	9.6
Female Headed	14.8	13.7
Extended/Intergenerational	23.6	20.5
Other	5.0	6.6
Family SES (Wave I)	-0.1 (0.04)	-0.0 (0.03)
<u>Adolescent Health</u> (Wave I)		
Self-Rated Health ^a	3.8 (0.02)	4.0 (0.02)
CES-D ^a	11.8 (0.19)	10.0 (0.14)
Somatic Symptoms ^a	10.0 (0.10)	8.9 (0.11)
Victimized in past year	11.3	27.6
<u>Academic Performance & Expectations</u> (Wave I)		
Difficulties in School ^a	3.9 (0.06)	4.6 (0.06)
Likely to attend college	79.9	71.9
GPA in most recent term	2.9 (0.02)	2.7 (0.02)

Notes:

^aHigher values reflect better self-rated health, more depressive symptoms, more somatic symptoms, and more difficulties in school.

Table 2
 Selected Bivariate Associations by Life Course Sexual Attraction and Gender, Weighted Data, Add Health, Waves I and IV ^a

	Opp-Sex Youth & Adult % or Mean (SE)	Same-Sex Youth % or Mean (SE)	Same-Sex Adult % or Mean (SE)	Same-Sex Youth & Adult % or Mean (SE)	No Sex Youth or Adult % or Mean (SE)
Females (n=7,516)					
<u>Educational Attainment</u>					
High School Diploma or Less	25.8	26.1	41.1*	21.1	40.2*
Some College or Associate's	36.4	44.0	37.4	41.1	33.7
Bachelor's or Higher	37.8	29.9	21.5*	37.8	26.2*
<u>Race/Ethnicity</u>					
Non-Hispanic White	69.2	58.9	70.1	72.6	59.7*
Non-Hispanic Black	15.9	17.7	12.8	12.4	19.1
Hispanic	10.7	13.9	12.3	9.7	15.9
Other Race/Ethnicity	4.1	9.5	4.7	5.2	5.3
Family SES	-0.0 (0.04)	-0.2 (0.07)	-0.2 (0.05)*	0.0 (0.12)	-0.3 (0.05)*
Self-Rated Health	3.8 (0.02)	3.6 (0.07)*	3.7 (0.05)*	3.2 (0.11)*	3.9 (0.04)
CES-D	11.5 (0.19)	13.5 (0.76)*	13.0 (0.51)*	16.7 (1.36)*	11.4 (0.50)
Somatic Symptoms	10.0 (0.10)	11.0 (0.60)	10.9 (0.32)*	14.8 (0.68)*	8.6 (0.30)*
Victimized year prior to Wave I	10.9	14.1	15.0	22.3*	8.9
Difficulties in School	3.8 (0.06)	4.4 (0.27)	4.7 (0.19)*	5.9 (0.29)*	3.3 (0.20)
Likely to attend college	81.6	77.8	75.1	75.0	72.0*
GPA	2.9 (0.02)	2.9 (0.07)	2.8 (0.05)*	2.8 (0.09)	2.9 (0.04)
Males (n=6,595)					
<u>Educational Attainment</u>					
High School Diploma or Less	35.9	50.5*	32.3	29.1	52.9*
Some College or Associate's	34.5	26.7	30.4	38.3	29.3*
Bachelor's or Higher	29.6	22.8	37.3*	32.6	17.7*
<u>Race/Ethnicity</u>					
Non-Hispanic White	69.7	63.1	63.6	50.3	64.8

	Opp-Sex Youth & Adult % or Mean (SE)	Same-Sex Youth % or Mean (SE)	Same-Sex Adult % or Mean (SE)	Same-Sex Youth & Adult % or Mean (SE)	No Sex Youth or Adult % or Mean (SE)
Non-Hispanic Black	13.8	19.3	12.7	28.3	18.8
Hispanic	11.1	14.2	18.6	13.0	11.2
Other Race/Ethnicity	5.4	3.3	5.1	8.5	5.2
Family SES	-0.0 (0.04)	-0.1 (0.06)	-0.1 (0.09)	-0.0 (0.16)	-0.2 (0.04)*
Self-Rated Health	4.0 (0.02)	3.9 (0.07)	3.9 (0.10)	3.9 (0.14)	3.9 (0.05)
CES-D	9.7 (0.14)	12.2 (0.52)*	11.8 (0.83)	12.1 (1.24)	9.9 (0.39)
Somatic Symptoms	8.9 (0.11)	9.7 (0.39)	9.3 (0.52)	10.0 (0.63)	8.0 (0.29)*
Victimized in past year	28.3	36.5	19.6	15.6	21.9*
Difficulties in School	4.6 (0.06)	5.7 (0.25)*	4.2 (0.28)	4.6 (0.43)	4.2 (0.20)
Likely to attend college	73.6	65.5	73.3	82.8	64.1*
GPA	2.7 (0.02)	2.5 (0.05)*	2.8 (0.08)	2.7 (0.12)	2.7 (0.06)

Notes:

^a t-test (continuous), χ^2 (categorical);

* p<0.05, two-tailed, Bonferroni adjusted for multiple comparisons (opp. sex youth & adult is referent group)

Table 3

Estimated Predicted Probabilities and Marginal Effects from Multinomial Logit Regressions Predicting Educational Attainment in Early Adulthood, Weighted Data, Add Health, Waves I and IV, Females (n=7,516)

	Model 1		Model 2		Model 3	
	PP (SE)	PP _j - PP _{ref} (SE)	PP (SE)	PP _j - PP _{ref} (SE)	PP (SE)	PP _j - PP _{ref} (SE)
High School Diploma or Less						
<u>Life Course Sexual Attraction</u>						
Opposite-Sex Youth & Adult	0.24 (0.01)	-ref-	0.24 (0.01)	-ref-	0.23 (0.01)	-ref-
Same-Sex Youth	0.22 (0.03)	-0.02 (0.03)	0.21 (0.03)	-0.03 (0.03)	0.20 (0.03)	-0.03 (0.03)
Same-Sex Adult	0.37 (0.03)	0.12 (0.03)**	0.34 (0.03)	0.10 (0.03)**	0.33 (0.03)	0.10 (0.03)**
Same-Sex Youth & Adult	0.20 (0.04)	-0.04 (0.05)	0.15 (0.04)	-0.09 (0.04)*	0.14 (0.04)	-0.08 (0.04)**
No Sexual Attraction Youth or Adult	0.34 (0.02)	0.10 (0.02)**	0.35 (0.03)	0.11 (0.03)**	0.32 (0.02)	0.10 (0.02)
Some College or Associate's Degree						
<u>Life Course Sexual Attraction</u>						
Opposite-Sex Youth & Adult	0.42 (0.01)	-ref-	0.43 (0.01)	-ref-	0.48 (0.01)	-ref-
Same-Sex Youth	0.50 (0.05)	0.08 (0.06)	0.50 (0.05)	0.07 (0.05)	0.57 (0.05)	0.09 (0.05)
Same-Sex Adult	0.43 (0.03)	0.01 (0.03)	0.44 (0.03)	0.01 (0.03)	0.48 (0.03)	0.00 (0.03)
Same-Sex Youth & Adult	0.48 (0.06)	0.07 (0.06)	0.46 (0.07)	0.03 (0.07)	0.50 (0.07)	0.02 (0.07)
No Sexual Attraction Youth or Adult	0.39 (0.02)	-0.03 (0.03)	0.41 (0.02)	-0.02 (0.03)	0.47 (0.03)	-0.01 (0.03)
Bachelor's Degree or Higher						
<u>Life Course Sexual Attraction</u>						
Opposite-Sex Youth & Adult	0.34 (0.02)	-ref-	0.33 (0.02)	-ref-	0.29 (0.02)	-ref-
Same-Sex Youth	0.28 (0.05)	-0.06 (0.05)	0.29 (0.05)	-0.04 (0.06)	0.23 (0.05)	-0.06 (0.05)
Same-Sex Adult	0.21 (0.03)	-0.14 (0.03)**	0.22 (0.03)	-0.11 (0.03)**	0.19 (0.02)	-0.10 (0.03)**
Same-Sex Youth & Adult	0.32 (0.07)	-0.03 (0.07)	0.39 (0.08)	0.06 (0.08)	0.36 (0.08)	0.07 (0.08)
No Sexual Attraction Youth or Adult	0.27 (0.02)	-0.07 (0.02)**	0.24 (0.02)	-0.09 (0.02)**	0.21 (0.02)	-0.08 (0.02)**

Notes: Model 1 adjusts for race/ethnicity, gender, nativity, region, urbanicity, family structure (wave I), family SES (wave I), and age (wave IV). Model 2 further adjusts for depressive symptoms, somatic symptoms, victimization, and self-rated health (all in wave I). Model 3 further adjusts for difficulties in school, academic expectations, and GPA in most recent academic term (all in wave I). PP=predicted probability. PP_j - PP_{ref} is the difference in PP between group *j* and the referent group (opp. sex youth & adult). These are marginal effects. All variables centered at grand mean.

* p<0.05;

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Table 4

Estimated Predicted Probabilities and Marginal Effects from Multinomial Logit Regressions Predicting Educational Attainment in Early Adulthood, Weighted Data, Add Health, Waves I and IV, Males (n=6,595)

	Model 1		Model 2		Model 3	
	PP (SE)	PP _j - PP _{ref} (SE)	PP (SE)	PP _j - PP _{ref} (SE)	PP (SE)	PP _j - PP _{ref} (SE)
High School Diploma or Less						
<u>Life Course Sexual Attraction</u>						
Opposite-Sex Youth & Adult	0.36 (0.01)	-ref-	0.36 (0.02)	-ref-	0.36 (0.02)	-ref-
Same-Sex Youth	0.48 (0.05)	0.12 (0.04)**	0.45 (0.04)	0.09 (0.04)*	0.44 (0.05)	0.08 (0.05)
Same-Sex Adult	0.29 (0.06)	-0.07 (0.06)	0.29 (0.06)	-0.07 (0.06)	0.31 (0.06)	-0.05 (0.06)
Same-Sex Youth & Adult	0.27 (0.08)	-0.09 (0.08)	0.28 (0.08)	-0.08 (0.08)	0.30 (0.09)	-0.07 (0.09)
No Sexual Attraction Youth or Adult	0.50 (0.03)	0.14 (0.03)**	0.51 (0.03)	0.15 (0.03)**	0.49 (0.03)	0.13 (0.03)
Some College or Associate's Degree						
<u>Life Course Sexual Attraction</u>						
Opposite-Sex Youth & Adult	0.39 (0.01)	-ref-	0.40 (0.01)	-ref-	0.44 (0.01)	-ref-
Same-Sex Youth	0.31 (0.04)	-0.08 (0.04)*	0.32 (0.03)	-0.08 (0.04)*	0.35 (0.04)	-0.09 (0.04)*
Same-Sex Adult	0.34 (0.05)	-0.05 (0.05)	0.36 (0.05)	-0.05 (0.05)	0.39 (0.06)	-0.05 (0.06)
Same-Sex Youth & Adult	0.44 (0.08)	0.06 (0.08)	0.48 (0.08)	0.07 (0.08)	0.51 (0.08)	0.06 (0.08)
No Sexual Attraction Youth or Adult	0.33 (0.03)	-0.05 (0.03)*	0.35 (0.03)	-0.06 (0.03)*	0.38 (0.03)	-0.06 (0.03)*
Bachelor's Degree or Higher						
<u>Life Course Sexual Attraction</u>						
Opposite-Sex Youth & Adult	0.25 (0.01)	-ref-	0.24 (0.01)	-ref-	0.19 (0.01)	-ref-
Same-Sex Youth	0.21 (0.03)	-0.04 (0.03)	0.22 (0.03)	-0.01 (0.03)	0.21 (0.04)	0.01 (0.04)
Same-Sex Adult	0.38 (0.06)	0.12 (0.06)	0.35 (0.07)	0.12 (0.06)	0.29 (0.06)	0.10 (0.06)
Same-Sex Youth & Adult	0.28 (0.06)	0.03 (0.06)	0.24 (0.06)	0.01 (0.05)	0.20 (0.05)	0.00 (0.05)
No Sexual Attraction Youth or Adult	0.17 (0.02)	-0.08 (0.02)**	0.15 (0.02)	-0.09 (0.02)**	0.13 (0.02)	-0.07 (0.02)**

Notes: Model 1 adjusts for race/ethnicity, gender, nativity, region, urbanicity, family structure (wave I), family SES (wave I), and age (wave IV). Model 2 further adjusts for depressive symptoms, somatic symptoms, victimization, and self-rated health (all in wave I). Model 3 further adjusts for difficulties in school, academic expectations, and GPA in most recent academic term (all in wave I). PP=predicted probability. PP_j - PP_{ref} is the difference in PP between group *j* and the referent group (opp. sex youth & adult). These are marginal effects. All variables centered at grand mean.

* p<0.05;

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