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ORIGINAL PAPER

Associations of Timing of Sexual Orientation Developmental Milestones and Other Sexual Minority Stressors with Internalizing Mental Health Symptoms Among Sexual Minority Young Adults

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Abstract Sexual minorities (mostly heterosexual, bisexual, lesbian/gay) are more likely than heterosexuals to have adverse mental health, which may be related to minority stress. We used longitudinal data from 1461 sexual minority women and men, aged 22–30 years, from Wave 2010 of the Growing Up Today Study, to examine associations between sexual minority stressors and mental health. We hypothesized that sexual minority stressors (earlier timing of sexual orientation developmental milestones categorized into early adolescence, middle adolescence, late adolescence/young adulthood; greater sexual orientation mobility; more bullying victimization) would be positively associated with mental health outcomes (depressive and anxious symptoms). Linear regression models stratified by gender and sexual orientation were fit via generalized estimating equations and controlled for age and race/ethnicity. Models were fit for each stressor predicting each mental health outcome. Reaching sexual minority milestones in early versus middle adolescence was associated with greater depressive and anxious symptoms among lesbians and gay men. Reaching sexual minority milestones in late adolescence/young adulthood versus middle adolescence was associated with greater depressive symptoms among lesbians, but fewer depressive and anxious symptoms among gay men. Greater sexual orientation mobility was associated with greater depressive symptoms among mostly heterosexual women. More bullying victimization was associated with greater depressive symptoms among bisexual women and with greater anxious symptoms among mostly heterosexual women. Sexual minority stressors are associated with adverse mental health among some sexual minority young adults. More research is needed to understand what may be protecting some subgroups from the mental health effects of sexual minority stressors.

Keywords Sexual orientation · Sexual minority · Minority stress · Victimization · Depression · Anxiety

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Introduction

Experiencing stressors, such as victimization, may confer risk for negative mental health outcomes for any individual, regardless of sexual orientation. Research has demonstrated that sexual minorities (lesbian, gay, bisexual, mostly heterosexual) are more likely than heterosexuals to experience victimization (Katz-Wise & Hyde, 2012) and to have negative mental health outcomes, particularly internalizing symptoms such as depression and anxiety (King et al., 2008; Meyer, 2003). Sexual orientation disparities in mental health have been attributed in part to experiencing minority stress related to stigmatization of sexual minority orientation (Meyer, 2003; Rosario, Schrimshaw, Hunter, & Gwadz, 2002), which may include experiencing victimization based on

sexual orientation. Although some research has investigated the link between minority stress and negative mental health outcomes among sexual minorities (Kuyper & Fokkema, 2011; Rosario et al., 2002), only a few studies have conceptualized sexual orientation mobility (Everett, 2015; Needham, 2012; Ott et al., 2013; Rosario, Schrimshaw, Hunter, & Braun, 2006) and timing of sexual orientation developmental milestones (Rosario, Schrimshaw, & Hunter, 2008; Ueno, 2010) as unique sexual minority stressors. This research considers three distinct types of sexual minority stressors–timing of sexual orientation developmental milestones, sexual orientation mobility, and victimization–and associations with mental health among sexual minority young adults.

Theories of sexual minority development propose that sexual minority individuals progress through a series of developmental stages (Cass, 1979; Meyer & Schwitzer, 1999). Evidence of a developmental trajectory has been found for specific psychosexual milestones, such as age of first experiencing same-gender attractions, age of first engaging in same-gender sexual behavior, and age of first identifying as a sexual minority (Floyd & Stein, 2002; Rosario et al., 1996). This trajectory has been found even by investigators who reject stage models (Rosario, Hunter, Maguen, Gwadz, & Smith, 2001). Research on timing of sexual orientation developmental milestones has demonstrated that men generally reach milestones at an earlier age than women (D'Augelli, 2006; Floyd & Bakeman, 2006; Katz-Wise, 2014; Katz-Wise et al., 2017; Rosario et al., 1996; Savin-Williams & Diamond, 2000). Beyond gender differences, there may be variability in the timing of milestones based on other sociodemographic characteristics, such as race/ethnicity (Balsam et al., 2015; Dubé & Savin-Williams, 1999; Parks, Hughes, & Matthews, 2004; Rosario, Schrimshaw, & Hunter, 2004) or sexual minority subgroup (Katz-Wise et al., 2017; Maguen, Floyd, Bakeman, & Armistead, 2002).

Timing of Sexual Orientation Development as a Stressor

The process of developing a sexual orientation identity during adolescence may be stressful for many individuals, particularly those who develop a sexual minority orientation due to stigma associated with same-gender orientation (Rosario et al., 2002). Early timing of sexual orientation developmental milestones may be considered a sexual minority stressor in the context of this stigma. Neurocognitive development and its positive impact on emotional regulation is ongoing during early adolescence and may be associated with relatively ineffective coping strategies during this developmental period, although coping strategies become more effective throughout adolescence (Casey, Jones, & Hare, 2008). Those who reach sexual orientation milestones in early adolescence rather than in late adolescence through young adulthood may be less able to cope effectively with stressors related to stigma of sexual minority identification. One study found that adult lesbians who had disclosed their sexual orientation at an earlier age reported more alcohol abuse (Parks & Hughes, 2007), which may suggest substance use as a way to cope with sexual minority stress. In addition, individuals reaching milestones earlier might have less access to supportive resources, such as programs for sexual minority teens (e.g., Gay Straight Alliance groups in high school). Indirect evidence from two studies found that earlier timing of sexual orientation developmental milestones was associated with negative mental health outcomes among gay men (Friedman, Marshal, Stall, Cheong, & Wright, 2008) and with homelessness in sexual minority youth aged 14–21 years (Rosario, Schrimshaw, & Hunter, 2012). Other research has found that compared to first having a same-gender sexual experience in adolescence, individuals who first had a same-gender sexual experience in young adulthood had more depressive symptoms, with stronger associations among women than men (Ueno, 2010). More research is needed to understand how timing of sexual orientation developmental milestones may be associated with mental health.

Sexual Orientation Mobility as a Stressor

Another stressor concerns sexual orientation mobility, which refers to changes in reported sexual orientation identity over time (Ott, Corliss, Wypij, Rosario, & Austin, 2011) and may be considered one version of sexual fluidity, which refers more broadly to changes in one or more dimensions of sexual orientation over time (Diamond, 2008; Katz-Wise, 2014). Previous research on sexual fluidity has not found significant associations between fluidity and timing of sexual orientation developmental milestones (Katz-Wise, 2014); however, sexual fluidity in sexual orientation identity and timing of milestones may independently predict mental health outcomes in sexual minorities. Changes in sexual orientation may be considered a sexual minority stressor, particularly for individuals who indicate movement toward a sexual minority orientation (e.g., first identifying as mostly heterosexual and later identifying as bisexual), as these individuals may be newly experiencing stigma related to sexual minority orientation. Some research has demonstrated that greater sexual orientation mobility toward sexual minority identities is associated with increased depressive symptoms (Everett, 2015), which may indicate a level of stress associated with sexual orientation mobility that negatively affects mental health. In addition, any change in an aspect of identity may prove to be a stressor, regardless of the direction of the change. Based on self-consistency and cognitive dissonance theories (Festinger, 1957; Rosenberg, 1979), changes in sexual orientation identity may challenge one's sense of self as consistent across contexts, which may result in distress. However, other research has found that individuals who reported a change in sexual attraction over time (e.g., first reporting same-gender attraction, then reporting other-gender attraction) reported lower levels of mental health problems than participants who consistently reported same-gender attractions (Needham, 2012). It is clear that more research is needed to understand how sexual orientation mobility may affect the mental health of sexual minorities.

Bullying Victimization as a Stressor

Bullying victimization is another stressor that may adversely affect mental health among sexual minorities. Previous research has found that sexual minorities are more likely than heterosexuals to experience victimization (Katz-Wise & Hyde, 2012). Adolescence is a time of heightened emotional reactivity, which may interact with environmental stressors (e.g., victimization) to result in the development of anxious and depressive symptoms (Casey et al., 2010). Additional implications of neurocognitive development for sexual minorities coping with victimization and sexual minority development during adolescence have been detailed elsewhere (Rosario & Schrimshaw, 2013). More research is needed to understand how sexual minority stressors are related to mental health among young adults across multiple sexual minority orientations.

The Current Study

The current research investigated prospective associations among sexual minority stressors (timing of sexual orientation developmental milestones, sexual orientation mobility, bullying victimization) and mental health outcomes (depressive and anxious symptoms) among sexual minority young adults in the Growing Up Today Study (GUTS). We hypothesized that earlier timing of sexual orientation developmental milestones, greater sexual orientation identity mobility, and more bullying victimization would be positively associated with greater depressive and anxious symptomatology among both women and men across sexual minority subgroups.

Method

Participants

Participants were 1098 sexual minority women and 363 sexual minority men, aged 22–30 years, who participated in Wave 2010 of GUTS, a national prospective cohort of children of participants from the Nurses' Health Study II. Recruitment details for GUTS are reported elsewhere (Field et al., 1999). Youth aged 9–14 years were enrolled in 1996 and assessed annually or biennially. Race/ethnicity for the analytic sample was 90.8% White. Informed consent was obtained from all participants prior to enrollment. This study was approved by the Brigham and Women's Hospital Institutional Review Board.

Measures

Sexual Orientation

Sexual orientation was based on the assessment from Wave 2010, with the item "Which of the following best describes your feelings?" and the following response options: completely heterosexual (attracted to persons of the opposite sex), mostly heterosexual, bisexual (equally attracted to men and women), mostly homosexual, completely homosexual (gay/lesbian, attracted to persons of the same sex), and not sure. When the 2010 report was missing, the 2007 report was used; when the 2010 and 2007 reports were missing, the 2001 report was used. Mostly homosexual and completely homosexual were combined into lesbian/gay due to small sample sizes, yielding the following three sexual orientation groups for analysis: mostly heterosexual, bisexual, lesbian/gay.

Sexual Orientation Developmental Milestones

Sexual orientation developmental milestones were assessed in Wave 2010 with five items adapted from the Sexual Risk Behavior Assessment Schedule–Youth (SERBAS-Y) (Meyer-Bahlburg, Ehrhardt, Exner, & Gruen, 1994), a reliable and valid measure (Rosario et al., 2006, 2012; Schrimshaw, Rosario, Meyer-Bahlburg, & Scharf-Matlick, 2006). Endorsement of the milestone (yes, no) and milestone age in years for participants who provided an affirmative response to endorsement were assessed for each of the following milestones: (1) lifetime identification as mostly heterosexual, bisexual, lesbian, or gay, (2) lifetime same-gender sexual attraction, (3) lifetime other-gender sexual attraction, (4) lifetime same-gender sexual experience, and (5) lifetime other-gender sexual experience. For the first milestone, participants were asked: "During your life, have you ever identified yourself as 'mostly heterosexual,' bisexual, or lesbian or gay?" If yes, "How old were you when you first identified as 'mostly heterosexual,' bisexual, or lesbian or gay?" For the second and third milestones, participants were asked: "During your lifetime, have you ever been sexually attracted to females/males?" If yes, "How old were you when you first realized you were sexually attracted to females/males? (Think about your first crush or the first time you recognized feeling sexually attracted to someone)." For the fourth and fifth milestones, participants were asked: "During your lifetime, have you ever had sexual contact with a female/male?" If yes, "How old were you when you first had sexual contact with a female/male?" Separate questions were asked to assess same-gender versus other-gender dimensions of sexual orientation. Milestone ages were further categorized into early adolescence (age $\leq$13 years), middle adolescence (ages 14–17 years), and late adolescence/young adulthood (ages 18–27 years) for ease of interpretation, by examining the distribution of ages for each variable and the sample sizes needed to achieve power to detect statistical significance.

Sexual Orientation Mobility

Changes in reported sexual orientation identity were assessed across seven waves of available data (1999–2013) (Ott et al., 2011). A score was assigned to each participant based on the number of changes, with higher scores indicating greater sex-

ual orientation mobility. This ordinal score represents the proportion of changes in sexual orientation identity that occurred out of all the opportunities to change sexual orientation identity across waves of data collection; range 0 = no change at any wave to 1 = change at every wave (Ott et al., 2011).

Bullying Victimization

Bullying victimization in the past year was assessed in Wave 2001 with one item adapted from the World Health Organization Health Behavior of School-Aged Children Survey (Due et al., 2005). The item was measured on a 5-point scale with the response options ranging from *I haven't been bullied* to *several times a week*. Higher scores indicated greater frequency of being bullied (range 1–5).

Depressive Symptoms

Depressive symptoms were assessed for the past week in Wave 2010 with 10 items from the Center for Epidemiologic Studies Depression (CES-D) scale short form (Radloff, 1977). Items were measured on a 4-point Likert scale from *rarely or none of the time* (0) to *all of the time* (4). A sum scale score was created, with higher scores indicating greater depressive symptomatology (range 0–30). In this sample, scale reliability was $\alpha = 0.82$ for women and $\alpha = 0.81$ for men.

Anxious Symptoms

Anxious symptoms were assessed for the past week in Wave 2010 with nine items from the Worry/Sensitivity subscale of the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Paget, 1981). Items were measured on a 6-point Likert scale from *none of the time* (0) to *all of the time* (5). A sum scale score was created, with higher scores indicating greater anxious symptomatology (range 0–45). In this sample, scale reliability was $\alpha = 0.93$ for women and $\alpha = 0.92$ for men.

Covariates

Age in years and race/ethnicity (*White, another race/ethnicity*) were assessed in Wave 1996.

Statistical Analysis

The original sample size from GUTS Wave 2010 was 8690 (5630 women, 3060 men). Participants were excluded from analyses if they were missing sexual orientation at Waves 2010, 2007, and 2001 ($n = 51$), if they reported a completely heterosexual sexual orientation in 2010 ($n = 7176$), or if they reported a different sex/gender in 2010 from the sex/gender reported in 1996 ($n = 2$). The final analytic sample size was 1461 (1098 women, 363 men).

Descriptive statistics were computed, and comparisons were made by gender and sexual orientation group using *t* tests for continuous variables and chi-square tests for categorical variables. Bullying victimization was not normally distributed and was therefore compared between genders using a Wilcoxon rank sum test and between sexual orientation groups using a Kruskal–Wallis test. Effect sizes were calculated using Cohen's *d* for *t* tests and phi for chi-square tests. Since considerable group differences were found in both the predictor and outcome variables, models were stratified by gender and sexual orientation group. Sexual minority stressors (sexual orientation milestone age, sexual orientation mobility, bullying victimization) predicted each mental health outcome (depressive and anxious symptoms). Models were fit separately for each predictor-outcome pair (e.g., sexual minority identity age predicting depressive symptoms). Interaction effects of gender by stressor could not be evaluated because of small sample sizes. Linear regression models were fit for each milestone age predicting each mental health outcome, with "middle adolescence" as the reference group. All models adjusted for age and race/ethnicity and were fit using generalized estimating equations assuming a compound symmetric working correlation structure to account for clustering within families, when more than one sibling was included in the study. Models were fit with SAS Version 9.3.

Results

Descriptive statistics are shown by gender in Table 1 and by gender and sexual orientation group in Table 2. Men reached the sexual minority identification, same-gender attraction, and same-gender sexual experience milestones at an earlier age than women, whereas women reached the other-gender sexual experience milestone at an earlier age than men (Table 1). Men reported more bullying victimization than women, and women reported greater anxious symptomatology than men. No significant gender difference was found for depressive symptoms or sexual orientation mobility. The correlation between depressive and anxious symptoms was 0.63 for the whole sample, 0.60 for women, and 0.66 for men. Regarding sexual orientation group differences (Table 2), the largest effect was found for same-gender attractions among men, with gay men reaching this milestone at an earlier age than bisexual and mostly heterosexual men.

Sexual Orientation Developmental Milestones

When testing for associations between each sexual orientation developmental milestone and mental health outcomes among women (Table 3), we found that reaching the sexual minority identity milestone and the same-gender sexual experience milestone in early versus middle adolescence was associated with greater depres-

Table 1 Descriptive statistics for sexual minority women ($N = 1098$) and men ($N = 363$) in the Growing Up Today Study

Measure	Women ($n = 1098$)	Men ($n = 363$)	Women versus men (effect size[a])
Sociodemographics			
Age (years, M/SD)[b]	25.4 (1.6)	25.3 (1.7)	0.06
Race/ethnicity (*n*, %)			0.06*
White	1004 (91.8)	319 (87.9)	
Another race/ethnicity	90 (8.2)	44 (12.1)	
Sexual orientation (*n,* %)			0.28**
Mostly heterosexual	860 (78.3)	230 (63.4)	
Bisexual	144 (13.1)	21 (5.8)	
Lesbian/gay	94 (8.6)	112 (30.9)	
Sexual minority stressors (predictors)[c]			
Sexual orientation developmental milestones			
Sexual minority identity endorsement (*n*, % yes)	730 (73.8)	231 (76.0)	−0.02
Sexual minority identity age (years, M/SD)	17.6 (3.9)	16.6 (4.2)	0.25**
Sexual minority identity age categories (*n*, %)			0.15**
Early adolescence	92 (12.6)	59 (25.5)	
Middle adolescence	252 (34.6)	71 (30.7)	
Late adolescence/young adulthood	385 (52.8)	101 (43.7)	
Same-gender attraction endorsement (*n*, % yes)	880 (88.8)	236 (77.9)	0.13**
Same-gender attraction age (years, M/SD)	16.7 (4.1)	15.0 (5.0)	0.39**
Same-gender attraction age categories (*n*, %)			0.22**
Early adolescence	160 (18.2)	96 (40.7)	
Middle adolescence	315 (35.8)	68 (28.8)	
Late adolescence/young adulthood	405 (46.0)	72 (30.5)	
Other-gender attraction endorsement (*n*, % yes)	957 (97.3)	248 (81.9)	0.26**
Other-gender attraction age (years, range: M/SD)	10.0 (3.4)	10.1 (3.5)	0.03
Other-gender attraction age categories (*n*, %)			0.05
Early adolescence	837 (87.5)	218 (87.9)	
Middle adolescence	110 (11.5)	24 (9.7)	
Late adolescence/young adulthood	10 (1.0)	6 (2.4)	
Same-gender sexual experience endorsement (*n*, % yes)	507 (51.3)	164(54.0)	−0.02
Same-gender sexual experience age (years, M/SD)	18.1 (4.1)	16.8 (4.6)	0.30**
Same-gender sexual experience age categories (*n*, %)			0.13**
Early adolescence	55 (10.9)	35 (21.3)	
Middle adolescence	151 (29.8)	46 (28.1)	
Late adolescence/young adulthood	301 (59.4)	83 (50.6)	
Other-gender sexual experience (*n*, % yes)	928 (99.0)	245 (80.6)	0.35**
Other-gender sexual experience age (years, M/SD)	16.3 (2.7)	17.0 (3.0)	0.25**
Other-gender sexual experience age categories (*n*, %)			0.10**
Early adolescence	101 (10.9)	21 (8.6)	
Middle adolescence	533 (57.5)	119 (48.6)	
Late adolescence/young adulthood	293 (31.6)	105 (42.9)	
Sexual orientation mobility (M/SD)	0.4 (0.2)	0.4 (0.2)	0.06
Bullying victimization (M/SD)	1.3 (0.6)	1.5 (0.8)	0.16**

Table 1 continued

Measure	Women ($n = 1098$)	Men ($n = 363$)	Women versus men (effect size[a])
Mental health (outcomes)[d]			
Depressive symptoms (M/SD)	8.9 (5.1)	9.1 (4.9)	0.04
Anxious symptoms (M/SD)	16.8 (8.9)	13.7 (8.1)	0.36**

[a] Effect sizes were Cohen's *d* for *t* tests and Cramer's phi for chi-square tests. Chi-square and *t* tests were used to test for gender differences. * $p < .05$, ** $p < .01$

[b] Age range: 22–30 years

[c] Milestone age ranges were: sexual minority identity (range 3–28 years), same-gender attraction (range 0–27 years), other-gender attraction (range 1–26 years), same-gender sexual experience (range 4–27 years), other-gender sexual experience (range 1–28 years). Milestone age categories were: early adolescence (≤13 years), middle adolescence (14–17 years), late adolescence/young adulthood (18–27 years). Sexual orientation mobility ordinal scores ranged from 0 = no change at any wave to 1 = change at every wave. Bullying victimization range 1–5

[d] Depressive symptoms range 0–30. Anxious symptoms range 0–45

sive and anxious symptoms in lesbians (Table 3). Conversely, reaching the other-gender attractions milestone in early versus middle adolescence was associated with fewer depressive symptoms among lesbians. Reaching the sexual minority identity milestone in late adolescence/young adulthood versus middle adolescence was also associated with greater depressive symptoms in lesbians.

When testing for associations between each sexual orientation developmental milestone and mental health outcomes among men (Table 3), we found that reaching the sexual minority identity milestone in early versus middle adolescence was associated with greater depressive and anxious symptoms. Conversely, reaching the other-gender attractions milestone in early versus middle adolescence was associated with fewer depressive symptoms among gay men and fewer anxious symptoms among bisexual men. Reaching the same-gender attractions milestone in early adolescence versus middle adolescence was associated with greater anxious symptoms among gay men. In addition, reaching the same-gender attractions milestone in late adolescence/young adulthood versus middle adolescence was associated with fewer depressive and anxious symptoms among gay men.

Sexual Orientation Mobility

When testing for associations between sexual orientation mobility and mental health outcomes among women (Table 3), we found that, among mostly heterosexual women, greater sexual orientation mobility was associated with greater depressive symptoms. No significant associations were found between sexual orientation mobility and mental health outcomes among men.

Bullying Victimization

When testing for associations between bullying victimization and mental health outcomes among women (Table 3), we found that, among bisexual women, more bullying victimization was associated with greater depressive symptoms, and among mostly heterosexual women more bullying victimization was associated with greater anxious symptoms. Among men, greater bullying victimization was associated with greater anxious symptoms among bisexual men.

Discussion

The aim of this research was to examine prospective associations between sexual minority stressors and mental health outcomes among sexual minority young adults. Our hypotheses were partially supported. Significant associations between sexual minority stressors and mental health outcomes were generally in the predicted direction. Experiencing sexual minority stressors was associated with greater depressive and anxious symptoms. However, not all associations were significant, suggesting that some sexual minority subgroups may be protected from negative effects of exposure to sexual minority stressors.

Timing of sexual orientation developmental milestones was associated with mental health outcomes more often than either bullying victimization or sexual orientation mobility. In general, reaching sexual minority milestones in early adolescence versus middle adolescence predicted greater depressive and anxious symptoms among lesbians and gay men only. In particular, first identifying as a sexual minority in middle adolescence (rather than early or late adolescence) appeared to be protective for lesbians' mental health, and reaching this milestone in early adolescence conferred risk for adverse mental health among both lesbians and gay men. Early timing of the same-gender sexual experience milestone had the greatest effect on lesbians' mental health, with earlier timing associated with greater depressive and anxious symptomatology. Perhaps early sexual experiences with the same-gender are particularly distressing due to stigma associated with sexual minority orientation (Rosario et al., 2002). However, timing of the first same-gender sexual experience was not significantly associated with mental health among men. It is also noteworthy that timing of the other-gender sexual experience milestone was not associated with mental health for any gender or sexual orientation group.

Table 2 Descriptive statistics by sexual orientation for sexual minority women ($N = 1098$) and men ($N = 363$) in the Growing Up Today Study

Measures	Women ($n = 1098$)				Men ($n = 363$)			
	Mostly heterosexual ($n = 860$)	Bisexual ($n = 144$)	Lesbian ($n = 94$)	Effect size[a]	Mostly heterosexual ($n = 230$)	Bisexual ($n = 21$)	Gay ($n = 112$)	Effect size[a]
Sexual minority stressors (predictors)[b]								
Sexual orientation developmental milestones								
Sexual minority identity endorsement (n, % yes)	532 (68.2)	121 (95.3)	77 (93.9)	0.25**	130 (68.4)	12 (70.6)	89 (91.8)	0.25**
Sexual minority identity age (years, M/SD)	17.7 (3.8)	16.9 (4.0)	17.6 (3.7)	0.01	17.8 (4.0)	15.3 (3.5)	15.0 (3.9)	0.11**
Sexual minority identity age categories (n, %)				0.10				0.27**
Early adolescence	60 (11.3)	24 (19.8)	8 (10.4)		21 (16.2)	3 (25.0)	35 (39.3)	
Middle adolescence	181 (34.1)	42 (34.7)	29 (37.7)		41 (31.5)	5 (41.7)	25 (28.1)	
Late adolescence/young adulthood	290 (54.6)	55 (45.5)	40 (52.0)		68 (52.3)	4 (33.3)	29 (32.6)	
Same-gender attractions endorsement (n, % yes)	674 (86.3)	125 (98.4)	81 (97.6)	0.15**	121 (64.4)	17 (100.0)	98 (100.0)	0.42**
Same-gender attractions age (years, M/SD)	17.4 (3.8)	14.5 (4.3)	14.8 (4.4)	0.08**	17.3 (4.6)	16.1 (4.3)	11.9 (3.6)	0.28**
Same-gender attractions age categories (n, %)				0.30**				0.55**
Early adolescence	85 (12.6)	48 (38.4)	27 (33.3)		24 (19.8)	5 (29.4)	67 (68.4)	
Middle adolescence	233 (34.6)	46 (36.8)	36 (44.4)		35 (28.9)	6 (35.3)	27 (27.6)	
Late adolescence/young adulthood	356 (52.8)	31 (24.8)	18 (22.2)		62 (51.2)	6 (35.3)	4 (4.1)	
Other-gender attractions endorsement (n, % yes)	772 (99.9)	126 (98.4)	59 (71.1)	0.49**	190 (100.0)	16 (100.0)	42 (43.3)	0.69**
Other-gender attractions age (years, M/SD)	9.7 (3.3)	10.5 (3.4)	12.6 (3.9)	0.05**	9.7 (3.2)	10.9 (3.5)	11.7 (4.3)	0.05**
Other-gender attractions age categories (n, %)				0.22**				0.32**
Early adolescence	692 (89.6)	108 (85.7)	37 (62.7)		177 (93.2)	12 (75.0)	29 (69.1)	
Middle adolescence	76 (9.8)	16 (12.7)	18 (30.5)		11 (5.8)	4 (25.0)	9 (21.4)	
Late adolescence/young adulthood	4 (0.5)	2 (1.6)	4 (6.8)		2 (1.1)	0 (0.0)	4 (9.5)	
Same-gender sexual experience endorsement (n, % yes)	331 (42.5)	96 (71.2)	80 (95.2)	0.35**	60 (31.8)	11 (64.7)	93 (94.9)	0.59**
Same-gender sexual experience age (years, M/SD)	18.1 (4.2)	17.9 (4.0)	18.3 (3.5)	0.00	16.3 (5.7)	18.6 (3.7)	16.9 (3.7)	0.02
Same-gender sexual experience age categories (n, %)				0.06				0.37
Early adolescence	39 (11.8)	10 (10.4)	6 (7.5)		23 (38.3)	1 (9.1)	11 (11.8)	
Middle adolescence	94 (28.4)	31 (32.3)	26 (32.5)		8 (13.3)	2 (18.2)	36 (38.7)	
Late adolescence/young adulthood	198 (59.8)	55 (57.3)	48 (60.0)		29 (48.3)	8 (72.7)	46 (49.5)	
Other-gender sexual experience endorsement (n, % yes)	749 (99.5)	119 (100.0)	60 (92.3)	0.19**	180 (95.2)	15 (88.2)	50 (51.0)	0.46**
Other-gender sexual experience age (years, M/SD)	16.5 (2.6)	15.9 (2.9)	15.5 (3.7)	0.01**	16.8 (3.0)	17.3 (2.3)	17.4 (3.2)	0.01
Other-gender sexual experience age categories (n, % yes)				0.11*				0.11
Early adolescence	70 (9.4)	20 (16.8)	11 (18.3)		17 (9.4)	0 (0.0)	4 (8.0)	
Middle adolescence	433 (57.9)	68 (57.1)	32 (53.3)		85 (47.2)	10 (66.7)	24 (48.0)	

Table 2 continued

Measures	Women ($n = 1098$)				Men ($n = 363$)			
	Mostly heterosexual ($n = 860$)	Bisexual ($n = 144$)	Lesbian ($n = 94$)	Effect size[a]	Mostly heterosexual ($n = 230$)	Bisexual ($n = 21$)	Gay ($n = 112$)	Effect size[a]
Late adolescence/young adulthood	245 (32.8)	31 (26.1)	17 (28.3)		78 (43.3)	5 (33.3)	22 (44.0)	
Sexual orientation mobility (M/SD)	0.3 (0.2)	0.5 (0.2)	0.5 (0.2)	0.05**	0.3 (0.2)	0.5 (0.2)	0.4 (0.3)	0.04**
Bullying victimization (M/SD)	1.3 (0.6)	1.3 (0.8)	1.3 (0.6)	0.00	1.5 (0.7)	1.5 (1.2)	1.6 (0.9)	0.01
Mental health symptoms (outcomes)[c]								
Depressive symptoms (M/SD)	8.7 (5.0)	9.9 (5.5)	9.2 (5.3)	0.01*	9.3 (4.6)	10.4 (5.6)	8.6 (5.2)	0.01
Anxious symptoms (M/SD)	16.8 (8.7)	17.4 (10.7)	16.6 (7.9)	0.00	13.7 (8.1)	15.5 (10.4)	13.5 (7.8)	0.00

[a] Effect sizes were Eta square for ANOVA and Cramer's phi for chi-square tests. Chi-square and ANOVA were used to test for differences between sexual orientation groups. *$p < .05$; **$p < .01$

[b] Milestone age ranges were: sexual minority identity (range 3–28 years), same-gender attraction (range 0–27 years), other-gender attraction (range 1–26 years), same-gender sexual experience (range 4–27 years), other-gender sexual experience (range 1–28 years). Milestone age categories were: early adolescence (≤13 years), middle adolescence (14–17 years), late adolescence/young adulthood (18–27 years). Sexual orientation mobility ordinal scores ranged from 0 = no change at any wave to 1 = change at every wave. Bullying victimization range 1–5

[c] Depressive symptoms range 0–30. Anxious symptoms range 0–45

Timing of sexual orientation developmental milestones may also affect mental health via a coping skills pathway. Considering that coping strategies become more effective throughout adolescence (Casey et al., 2008), it is possible that individuals who reach milestones later may have better developed coping skills that are protective for mental health. A study of sexual minority development and alcohol use among adult lesbians found that earlier age of sexual orientation identity disclosure was associated with more alcohol consumption-related problems (Parks & Hughes, 2007), suggesting that lesbians who reach developmental milestones earlier may use maladaptive strategies to cope with minority stress, which may indicate adverse mental health. Although that study did not assess mental health, other research has indicated that the odds of experiencing depression as an adult were greater for individuals who reached sexual orientation developmental milestones early compared to individuals who reached milestones late (Friedman et al., 2008). Later timing of milestones may also confer protective benefits, such as enabling access to sexual minority specific resources and communities. However, first identifying as a sexual minority in later adolescence predicted more depressive symptoms among lesbians in the current study, suggesting that earlier timing does not always indicate more risk for adverse mental health. Furthermore, reaching the other-gender attractions milestone in early versus middle adolescence was associated with fewer depressive and anxious symptoms among lesbians, gay men, and bisexual men. Perhaps reaching milestones associated with heterosexuality at an earlier age is also protective for mental health because it is consistent with heteronormativity. More research is needed to clarify risks and benefits associated with timing of sexual orientation milestones and to identify pathways between milestones and other stressors and negative mental health outcomes.

Significant associations of sexual orientation mobility and bullying victimization with mental health appeared more often among subgroups of sexual minority women characterized by orientation toward more than one gender (mostly heterosexual, bisexual). Some research has found that bisexual individuals experience prejudice and discrimination from both heterosexuals and sexual minorities (Mulick & Wright, 2002) and experience more victimization than other sexual orientation groups (Katz-Wise & Hyde, 2012). In addition, previous research has indicated that bisexuals have more negative mental health outcomes than other sexual minorities (Blosnich, Farmer, Lee, Silenzio, & Bowen, 2014; Case et al., 2004; Lehavot, 2012). A review of research on physical and mental health of mostly heterosexuals found that these individuals reported poorer mental health than heterosexuals, but better mental health than bisexuals (Vrangalova & Savin-Williams, 2014). The current research suggests that sexual orientation mobility and bullying victimization may negatively affect mental health more so among mostly heterosexual and bisexual women than among lesbians and gay men. Considering that past year bullying victimization was reported in 2001 and depressive and anxious symptoms were reported in 2010, it is possible that bullying victimization produced initial negative mental health outcomes in other sexual minority subgroups, but that these effects lessened over time. Lesbian and gay individuals may also have more access than mostly heterosexual and bisexual individuals to support networks, such as sexual minority communities and resources that may protect them from the negative effects of these sexual minority stressors. Alter-

Table 3 Generalized estimating equations linear regression coefficients[a] for models[b] testing associations between sexual minority stressors and mental health among sexual minority women ($N = 1098$) and men ($N = 363$) in the Growing Up Today Study

Models	Depressive symptoms in women β (SE)			Anxious symptoms in women β (SE)		
	Mostly heterosexual	Bisexual	Lesbian	Mostly heterosexual	Bisexual	Lesbian
Sexual orientation developmental milestones						
Sexual minority identity milestone age						
Early versus middle adolescence	–[c]	−0.05 (1.3)	**4.88 (2.1)**	–	2.52 (3.0)	7.05 (3.8)
Late versus middle adolescence	–	−1.18 (1.1)	**3.08 (1.1)**	–	0.80 (2.0)	2.77 (1.7)
Same-gender attractions milestone age						
Early versus middle adolescence	−0.28 (0.9)	−1.29 (1.2)	1.11 (1.3)	−0.09 (1.1)	−1.96 (2.3)	3.38 (2.0)
Late versus middle adolescence	−0.53 (0.7)	−1.80 (1.3)	1.16 (1.2)	−1.38 (0.8)	−4.00 (2.3)	4.02 (2.2)
Other-gender attractions milestone age						
Early versus middle adolescence	−0.58 (0.6)	−1.84 (2.6)	**−3.53 (1.6)**	0.91 (1.0)	4.37 (2.3)	−3.91 (2.2)
Late versus middle adolescence	1.16 (3.3)	–	3.47 (3.2)	−0.07 (3.0)	−1.68 (6.8)	4.69 (3.5)
Same-gender sexual experience milestone age						
Early versus middle adolescence	–	–	**8.44 (3.2)**	–	–	**10.99 (4.8)**
Late versus middle adolescence	–	–	2.00 (1.0)	–	–	3.51 (1.8)
Other-gender sexual experience milestone age						
Early versus middle adolescence	0.47 (0.6)	2.89 (1.5)	1.88 (1.7)	0.85 (1.1)	3.76 (3.1)	3.71 (2.6)
Late versus middle adolescence	−0.18 (0.4)	0.60 (1.2)	−0.70 (1.4)	1.06 (0.7)	−0.96 (2.0)	−2.04 (2.2)
Sexual orientation mobility	**2.18 (0.9)**	−1.72 (1.7)	0.54 (1.8)	2.48 (1.6)	1.12 (3.5)	−2.27 (3.2)
Bullying victimization	0.76 (0.4)	**1.87 (0.8)**	0.95 (1.1)	**1.84 (0.6)**	1.67 (1.4)	2.65 (1.6)
Models	Depressive symptoms in men β (SE)			Anxious symptoms in men β (SE)		
	Mostly heterosexual	Bisexual	Gay	Mostly heterosexual	Bisexual	Gay
Sexual orientation developmental milestones[c]						
Sexual minority identity milestone age						
Early versus middle adolescence	–[d]	–	**2.82 (1.4)**	–	–	**5.03 (2.0)**
Late versus middle adolescence	–	–	0.79 (1.3)	–	–	1.31 (1.9)
Same-gender attractions milestone age						
Early versus middle adolescence	–	3.03 (3.1)	0.63 (1.2)	–	−3.06 (6.6)	**3.75 (1.5)**
Late versus middle adolescence	–	1.09 (2.3)	**−4.88 (1.4)**	–	−2.98 (5.6)	**−9.28 (1.8)**
Other-gender attractions milestone age						
Early versus middle adolescence	−0.35 (1.5)	−1.84 (2.6)	**−4.04 (1.5)**	1.54 (2.8)	**−12.21 (5.4)**	−1.93 (2.2)
Late versus middle adolescence	−2.49 (1.5)	–	−3.77 (2.5)	−1.30 (3.4)	–	−0.82 (4.4)
Same-gender sexual experience milestone age						
Early versus middle adolescence	–	–	1.42 (1.6)	–	–	2.16 (2.8)
Late versus middle adolescence	–	–	0.41 (1.1)	–	–	0.73 (1.7)
Other-gender sexual experience milestone age						
Early versus middle adolescence	−0.82 (0.9)	0.27 (2.9)	−1.91 (2.6)	−0.65 (1.8)	−3.95 (5.2)	0.19 (4.7)
Late versus middle adolescence	−0.23 (0.7)	–	−2.58 (1.6)	0.34 (1.3)	–	0.21 (2.3)
Sexual orientation mobility	1.65 (1.8)	−1.26 (6.5)	3.25 (2.1)	1.19 (2.6)	16.21 (11.5)	−0.71 (3.7)

Table 3 continued

Models	Depressive symptoms in menβ (SE)			Anxious symptoms in menβ (SE)		
	Mostly heterosexual	Bisexual	Gay	Mostly heterosexual	Bisexual	Gay
Bullying victimization	−0.19 (0.7)	−0.37 (0.9)	−0.56 (0.7)	2.22 (1.3)	**5.76 (2.0)**	−0.93 (1.2)

[a] Significant effects ($p < .05$) are bolded. All numbers are rounded to the nearest tenth or hundredth. β Beta, *SE* standard error

[b] Models were stratified by gender and sexual orientation group and controlled for age in years (linear) and race/ethnicity (dichotomous). Separate models were run for each predictor-outcome pair (e.g., bullying victimization predicting depressive symptoms). For models with milestone age as the predictor, middle adolescence was the reference group

[c] Early and late adolescence is compared with middle adolescence (the referent)

[d] Results are not presented for some sexual orientation groups for some sexual orientation developmental milestones because milestone age was assessed only for participants who responded *yes* to having experienced the milestone. Within some sexual orientation groups, milestones were not endorsed in high enough proportion to obtain information on milestone age, resulting in a large amount of missingness (>40%)

natively, these results may be explained by having greater statistical power to detect associations between sexual minority stressors and mental health among mostly heterosexual and bisexual women than other sexual minority subgroups.

Some limitations of this research should be mentioned. The GUTS cohort is neither representative of the population nor diverse in terms of race/ethnicity; however, the participants were not recruited based on their sexual minority status, which may improve generalizability. Future research should examine associations between sexual minority stressors and mental health using more representative and diverse samples, which would also allow for an investigation of how sexual minority stressors may interact with other minority stressors, such as racism. The sample sizes for some sexual orientation subgroups were quite small, particularly for bisexual men ($n = 21$). Future research should strive for larger sample sizes of sexual minority subgroups to enable greater statistical power to detect associations between sexual minority stressors and mental health. Regarding measurement, we used the 2010 report of sexual orientation as the primary report for the analyses, even though bullying victimization was assessed in 2001. It is possible that for some participants, sexual orientation reported in 2001 was different from sexual orientation reported in 2010. We accounted for this by examining sexual orientation mobility as a predictor of mental health outcomes. In addition, bullying victimization was assessed in only one wave. Future research would benefit from the use of more detailed victimization measures administered in multiple waves that assess different types of victimization and victimization specifically attributed to sexual orientation (Katz-Wise & Hyde, 2012). Finally, an examination of how coping skills develop in tandem with sexual orientation milestones would be a useful direction for future research.

Conclusions

In summary, the current research found associations of sexual minority stressors with mental health for some sexual minority subgroups, thus suggesting possible heterogeneity in pathways between sexual orientation development and mental health. Future prevention and intervention efforts should pay particular attention to the negative effects of bullying victimization on mostly heterosexual and bisexual women. Additional support may also be needed for lesbians and gay men who reach sexual orientation developmental milestones in early adolescence and individuals who experience sexual orientation mobility. In summary, more research is needed to understand what may be protecting some subgroups more than others from the mental health effects of sexual minority stressors so that all groups can be similarly protected.

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Compliance with Ethical Standards

Conflict of interest Drs. Katz-Wise, Scherer, and Austin were supported by grants from the National Institute of Child Health and Development (NIH R01 HD066963) and the Maternal and Child Health Bureau, Health Resources and Services Administration (Leadership Education in Adolescent Health Project 6T71-MC00009). Drs. Rosario and Austin were supported by a grant from the National Institute of Child Health and Development (NIH R01 HD057368). Dr. Austin was additionally supported by the Maternal and Child Health Bureau, Health Resources and Services Administration (T76-MC00001). Dr. Calzo was supported by a grant from the National Institute on Drug Abuse (NIH K01 DA034753). All authors declare no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the Brigham and Women's Hospital Institutional Review Board and with the 1964 Helsinki declaration and its later amendments.

Informed Consent Informed consent was obtained from all participants included in the study.

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