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Sexual (Minority) Trajectories, Mental Health, and Alcohol Use: A Longitudinal Study of Youth as They Transition to Adulthood

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Abstract

Lesbian, gay, bisexual, and queer/questioning youth health disparities are well documented; however, study limitations restrict our understanding of how the temporal interplay among domains of sexuality (attraction, behavior, and identity) situate individuals to be more or less at risk for poor mental health and alcohol use across the transition to adulthood. Four waves of data from the National Longitudinal Study of Adolescent to Adult Health (n = 12,679; 51.29 % female) were used with repeated measures latent class analysis to estimate sexual trajectory groups designated by prospective reports of romantic attraction, sexual/romantic behavior, and sexual identity from adolescence to adulthood. Five unique trajectories emerged: two heterosexual groups (heterosexual early daters [58.37 %] and heterosexual later daters [29.83 %]) and three sexual minority groups (heteroflexible [6.44 %], later bisexually identified [3.32 %], and LG[B] identified [2.03 %]). These sexual trajectories differentiate risk for depressive symptomology, suicidal thoughts and behaviors, and alcohol use during adolescence and early adulthood. Groups where individuals first reported same-sex attraction and sexual minority identities in adulthood (heteroflexible and later bisexually identified) had similar levels of depression, suicidality, and greater substance use than those who largely reported same-sex attraction and behavior during adolescence (the LG[B] identified group). These later recognition groups showed greater risk for poor outcomes in waves where they also first reported these changes in attraction, behaviors, and identities. The emergence of three sexual minority groups reveal within-group differences in sexuality and sexual trajectories and how these experiences relate to risk and timing of risk across the transition to adulthood.

Keywords

LGB youth; Sexual development; Mental health; Depression; Suicide; Alcohol use

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Introduction

Sexual minorities (those with same-sex attractions, behaviors, and/or identities) face a unique set of social stressors that contribute to elevated rates of poor mental health and maladaptive coping strategies such as substance use (Hatzenbuehler 2009; Marshal et al. 2008, 2011; Meyer 2007). Despite advances in the lesbian, gay, bisexual (LGB) health disparities literature, studies often rely on comparisons between sexual minorities and heterosexual peers, an approach that limits our understanding of within-group variability that may designate differential risk (Diamond 2003; Poteat et al. 2009). Similarly, researchers investigating the relationship between sexuality and health outcomes typically assign sexual orientation using single-item measures (i.e., attraction, behavior, or identity) or test associations between individual indicators of sexual orientation with outcomes independently (as notable exceptions, see Fergusson et al. 2005; Talley et al. 2012). Using these methods are problematic, as research demonstrates that outcomes vary depending on the measurement of sexual orientation (e.g., Bostwick et al. 2010; Matthews et al. 2014) and that reports on different indicators of sexual orientation are not always congruent concurrently (e.g., Gates 2010; Chandra et al. 2011) or over time (e.g., Needham 2012; Ueno 2010).

Along with the use of single-item measures, the predominant reliance on cross-sectional designs creates missed opportunities to understand how the developmental and dynamic nature of sexuality impacts mental health and well-being. As patterns and timing of sexual development tend to be relatively idiosyncratic (Savin-Williams and Cohen 2007), one-time, single-item measures may misrepresent individuals who experience differences in sexual maturation. Likewise, preliminary research investigating the stability of sexuality over time (see Needham 2012 and Ueno 2010) suggests that the emergence and sequence of sexual developmental milestones [e.g., awareness of same-sex attraction, sexual or romantic experiences with same-sex partners, or self-identification as gay, lesbian, or bisexual (among others)], may also differentiate risk. However, this nuanced investigation of differential sexual maturation and its association with mental health and substance use outcomes is rarely examined. These gaps prevent those working with sexual minority populations from understanding how sexual development relates to risk, and such investigations have important implications for the timing and implementation of programming aimed at reducing lesbian, gay, bisexual, and queer/questioning (LGBQ) mental health disparities.

To address this gap, we used data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) to identify patterns of sexual development from adolescence to adulthood with repeated measures of romantic attraction, romantic/sexual behavior, and sexual identity. To elucidate the association between sexual maturation and risk, we assessed whether differences in the endorsement of same-sex attractions, behaviors, and non-heterosexual identities, and their timing are differentially associated with mental health (depressive symptomology and suicidality) and alcohol use across the transition to adulthood.

Sexual Development and Sexual Milestones

Until recently, linear theoretical developmental stage models were used to describe the experience of sexual identity maturation among sexual minorities (see Cass 1979; Morris 1997; Troiden 1989). Their predominant theme begins with the individual's awareness of feeling different, experiencing confusion, or recognizing same-sex attraction. Sequentially, this awareness begets exploration with same-sex partners or the investigation of one's same-sex identity through social or community interaction. Following this exploration, individuals are hypothesized to integrate and accept their sexual minority identity, disclose this status to others, and pursue romantic relationships with desired partners (Morris 1997; Rosario et al. 2001). Although this linear trajectory is reasonable and has accumulated modest empirical support (Cass 1984; Levine 1997), much of the research investigating the timing and sequence of sexual minority development does not consistently provide support (Saewyc et al. 2004; Savin-Williams and Cohen 2007; Savin-Williams and Diamond 2000). In fact, sexuality, and particularly sexual identity, is believed to be more fluid across the life course than previously assumed, especially for women (Diamond 2008; Rosario et al. 2006).

More universally and empirically supported than linear stage theories is the experience of sexual milestones. Although typically referred to in linear fashion, sexual milestones vary in their sequence and timing across individuals (Savin-Williams and Cohen 2007). Generally, those who report same-sex sexuality or sexual minority identities recall "feeling different" in childhood and adolescence (Bailey and Zucker 1995; D'Augelli et al. 2008). Often, but not always, the awareness of same-sex attraction follows, and studies using adult samples find congruence in retrospective reporting on the age of this awareness which typically occurs around age 10 for both sexes (D'Augelli et al. 2008; Institute of Medicine (IOM) 2011; Savin-Williams and Diamond 2000). The progression of same-sex romantic/sexual behavior and self-identification is less ubiquitous. Timing of first same-sex sexual experiences varies across samples and is not necessarily correlated with the timing of same-sex attraction or the adoption of a sexual minority identity (Rosario et al. 1996; Rosario et al. 2006; Savin-Williams and Diamond 2000). For example, many youth who identify as LGB do so prior to experiencing a sexual relationship with a same-sex partner. Similarly, individuals who participate in sexual or romantic activity with same-sex partners do not necessarily adopt a sexual minority identity (Savin-Williams and Cohen 2007).

Unfortunately, many studies that assess the timing of sexual milestones rely on older adolescent or adult samples that require retrospective reporting (Floyd and Stein 2002; Rosario et al. 2006). Of the more recent US studies that use prospective reports to follow individual transitions in sexuality, two consist of relatively small samples [79 adult females over 10 years (Diamond 2008); 156 youth over 1 year (Rosario et al. 2006)] and required that participants identify as non-heterosexual for sample eligibility which excludes individuals who potentially shift from different-sex attractions, behaviors, and heterosexual identities. A third prospective study used data from Add Health to assess the prevalence of attraction, behavior, and identity across three waves from adolescence to early adulthood (Savin-Williams and Ream 2007) but did not report the intra-individual stability or change in these reports over time. Collectively, these studies provide descriptive information regarding

change in sexual orientation but did not assess the association of these experiences with mental health or health behaviors.

Connections to Mental Health and Alcohol Use

Minority stress theory (Meyer 2003, 2007) is a particularly helpful framework for explaining the preponderance of poor mental health among sexual minorities. Minority stress theory models the impact of unique minority stressors, such as harassment, discrimination, and victimization, along a continuum ranging from broad societal attitudes to more proximal intrapersonal experiences of perceived stigma and internalized homophobia. Minority stress theory suggests that exposure to stigmatization related to one's sexual minority status, if severe or persistent, can elevate the risk for poor mental health and well-being; such hypotheses are supported by substantial empirical evidence across youth (Fedewa and Ahn 2011; Saewyc 2011) and adult samples (e.g., Katz-Wise and Hyde 2012; Newcomb and Mustanski 2010). Studies using both convenience and nationally representative samples across various developmental stages highlight disparities across a number of psychological symptoms and diagnosable disorders, including, but not limited to, depression (Marshal et al. 2011), mood disorders (e.g., Bostwick et al. 2010), anxiety disorders (e.g., Hatzenbuehler et al. 2010), posttraumatic stress disorder (D'Augelli et al. 2006), suicidal thoughts (e.g., Russell and Toomey 2012, 2013), and suicidal behavior (e.g., Bostwick et al. 2014). Importantly, a cadre of studies assess the mechanisms through which these mental health disparities emerge including victimization (e.g., Russell et al. 2014a), discrimination (e.g., Hatzenbuehler et al. 2010), fear of rejection (D'Augelli et al. 2005) and violence (Bell and Perry 2015), among others (for reviews, see Katz-Wise and Hyde 2012, and Meyer 2003).

As with mental health, studies consistently demonstrate that sexual minority youth and adults report more general alcohol use, frequency of alcohol use (e.g., Talley et al. 2014), heavy episodic or binge drinking (e.g., McCabe et al. 2009), earlier onset of drinking (e.g., McCabe et al. 2013; Talley et al. 2014), problems related to drinking (e.g., Talley et al. 2012) and alcohol abuse and dependence (McCabe et al. 2009, 2013) than their different-sex attracted and heterosexual peers. Similarly, studies also illustrate the mechanisms that contribute to these disparities are directly related to minority stress experiences such as discrimination and victimization for both adolescent (e.g., Birkett et al. 2009; Newcomb et al. 2012) and adult populations (Hatzenbuehler et al. 2010; McCabe et al. 2010).

In a meta-analysis conducted by Marshal et al. (2008), sexual minority youth were 2–5 times more likely to report using alcohol, and rates were particularly high for females (e.g., Eisenberg and Wechsler 2003; Dermody et al. 2014), bisexuals (Talley et al. 2014), and mostly heterosexual youth (e.g., Marshal et al. 2012). Studies investigating adult samples find similar trends in risk (e.g., McCabe et al. 2005, 2009; Reed et al. 2010). This greater likelihood of LGBQ youth initiation of alcohol use and hazardous drinking is concerning, as drinking behavior and patterns developed in adolescence often persist and increases the risk for excessive alcohol use and alcohol abuse and dependence disorders in adulthood (e.g., Brook et al. 2002; Brown et al. 2008). In fact, studies assessing the rate of alcohol use across the transition to adulthood reveal that alcohol use disparities between sexual minority and heterosexual peers become greater during the transition to adulthood, especially in men (e.g.,

Dermody et al. 2014; Marshal et al. 2009), and studies using nationally representative adult samples find that those who are non-heterosexual, regardless of measurement, report higher levels of alcohol abuse and dependence than heterosexual peers (e.g., McCabe et al. 2009).

It has become increasingly common for studies that investigate sexual minority health disparities to use multiple measures of sexuality (attraction, behavior, and identity), and the growing inclusion of these items in nationally representative surveys demonstrates dissonance in reports across attraction, behavior, and identity in both adolescent and adult samples (e.g., Chandra et al. 2011; Mustanski et al. 2014). Regarding sexual minorities, studies consistently show a greater proportion of individuals reporting same-sex attraction followed by behavior with same-sex partners and, to an even lesser extent, the adoption of a sexual minority identity (see IOM 2011, for review). These are important factions to explore, because researchers investigating concurrent reports of attraction, behavior, and/or sexual minority identity find differential risk for various mental health outcomes. One study investigating differences in contemporaneous reports of identity and behavior in youth found that the odds of having planned a suicide attempt were 4.6 times greater for youth asserting sexual minority identities than for those with heterosexual identities (Matthews et al. 2014). Comparatively, the odds of having planned a suicide attempt for those who reported sexual behavior with only same-sex partners were 1.3 times greater than youth reporting sexual behavior with different-sex partners only. Further, studies using adult samples report similar patterns regarding differential risk for lifetime mood and anxiety disorders when assessing mental health outcomes between groups defined by attraction or behavior compared to sexual identity (see Bostwick et al. 2010). Likewise, for studies assessing past-year heavy episodic binge drinking and alcohol dependence among adults, results indicated differences across sexual orientation measures (McCabe et al. 2009). For example, women who reported a lesbian identity had 3.6 greater odds of past-year alcohol dependence compared to heterosexual women. This was in contrast to comparisons made between those reporting only female sexual attractions [2.0 Odds Ratio (OR)] and sexual behavior with only females (1.3 OR) and those who reported attractions to and behaviors with only different-sex individuals, respectively. Similar findings were also present for men (2.9 OR for gay identified, 1.8 OR for only male attracted, 1.2 OR for only male sexual behavior compared to heterosexual identified, solely different-sex attracted, and sexual behavior with different-sex partners only, respectively).

When these differences are explored and presented within the same sample of individuals, such findings suggest elevated risk for those who assert sexual minority identities compared to those reporting sexual minority attractions or behaviors. Notably, these studies assessed the associations between attraction, behavior, and identity independently with outcomes, an oversight that limits our understanding of how the facets of sexuality, a multidimensional construct, simultaneously coalesce to influence the experience of individuals that put them at more or less risk. For example, it may be that those with same-sex attractions, behaviors *and* sexual minority identities are more susceptible to experiences of stigma, discrimination, and rejection than those who recognize same-sex attractions and/or engage in romantic/sexual activity with same-sex partners but do not adopt or assert a sexual minority identity.

Along with its multifaceted nature, sexuality is a dynamic developmental process that occurs over time and, thus, requires longitudinal investigation (Saewyc et al. 2004; Saewyc 2011). To our knowledge, only two studies have assessed the variability in longitudinal prospective reports of sexuality across the transition to adulthood in conjunction with mental health and alcohol use outcomes (both of which used Add Health data). Ueno (2010) recoded reports of same-sex attraction, behavior, and sexual minority identities from adolescence to adulthood to reflect four categories of same-sex experience: none, adolescence only, young adulthood only, and both. The results were that the adolescence-only group reported poorer mental health during adolescence but not after the transition to adulthood. The reverse was true for those reporting adulthood-only same-sex experiences, revealing that the shift to a marginalized group was associated with increased risk for poor mental health and binge drinking for females in adulthood. Expectedly, males and females who reported stable same-sex experience across waves were at highest risk for poor mental health across both periods, but only females in this category reported increases in frequency of binge drinking. Similarly, Needham (2012) identified stability and change in attraction from adolescence to adulthood and found that females who were consistent in same-sex attraction were at greater initial risk for depression, suicidal thoughts, and heavy drinking, whereas same-sex attracted males were only at risk for depression initially. Neither same-sex attracted males nor females, regardless of stability or change in attraction, experienced differences in their rate of change in depression, suicidal thoughts, and drinking over time when compared to heterosexual peers, suggesting that these disparities do not increase across the transition to adulthood. Such contradictions require further exploration. Additionally, the measurement of sexuality in these studies, although commendable, did not explicitly address the intersections of attraction, behavior, and sexual identity over time, missing potentially important within-group differences for risk and timing of risk.

The Current Study

Sexual maturation and sexual identity development is a process that occurs over time (Eliason and Schope 2007), and reported same-sex attraction, behavior, and sexual minority identities are often not synonymous concurrently (Chandra et al. 2011; Gates 2010) and can show trends of development and relative fluidity from adolescence to adulthood (e.g., Needham 2012; Saewyc 2011). Thus, we hypothesized that at least three groups would emerge with distinct attraction, behavior, and identity development profiles. Because latent class analyses are exploratory, we cannot definitively state expected differences; however, based on previous work with these data (Savin-Williams and Ream 2007) and earlier studies using latent class analyses with multiple items measuring sexuality (Fergusson et al. 2005; Talley et al. 2012), we hypothesized that empirically derived profiles would present at least one consistent heterosexual group (different-sex attraction, behavior, and heterosexual identity), one consistent sexual minority group (same-or both-sex attractions, behaviors, and non-heterosexual identities), and one or more groups with variations in attraction, behavior, and identities contemporaneously and/or across the transition to adulthood. Because mental health and alcohol use outcomes vary across measures of sexual orientation (e.g., Bostwick et al. 2010; Matthews et al. 2014) and the timing of self-reported sexual minority status (Ueno 2010), assessing longitudinal patterns of reported attraction, behavior, and identity and their association with mental health may also differentiate risk. Building on these

previous results, we hypothesized that sexual development groups would differ in the prevalence of depressive symptoms and suicidality and that those groups characterized by same-sex attractions, behaviors, and sexual minority identities would report poorer mental health outcomes than groups characterized by consistent heterosexual attractions, behaviors, and identities across waves.

Method

Data Source and Sample

We used data from all four waves of the National Longitudinal Study of Adolescent to Adult Health (Add Health; Harris et al. 2009), a comprehensive study following US adolescents into adulthood and assessing the multiple contexts within which they develop. Prevalence of romantic attractions and sexual/romantic partners were collected at all four waves, and sexual identity was reported at Waves 3 and 4. Collected in 1995, Wave 1 (W1) surveyed 20,745 7th–12th graders and their parents. One year later Wave 2 (W2) included 14,738 of the original participants. Wave 3 (W3) data were collected 5–6 years later when participants (n = 15,197 from W1) were young adults (ages 18–24). Wave 4 (W4) was conducted in 2008–2009, when participants were ages 24–32 (n = 15,701 of the original sample). All research activity for this study was approved by the Florida State University institutional review board.

The current sample was restricted to those who were assigned sample weights (see Chantala 2006) and were 13–18 years old at W1 to minimize developmental differences. Specifically, the majority of respondents transitioned to young adulthood between W2 and W3; thus, those who were over the age of 18 during W1 were eliminated, as they would have already entered this transition prior to the completion of W2. Similarly, individuals under 13 years of age at W1 would be, on average, 19 years old at W3 which would confound differences between W2 and W3 comparisons. Along with minimizing age redundancies, this criteria eliminated developmental confounds. These restrictions resulted in a sample of 15,272 individuals. Despite the ability of latent class analysis estimation to account for missingness during estimation, only those who responded to 6 or more of the 10 latent class indicators were retained to minimize the influence of missing values on group membership estimation. As such, individuals were not required to respond to all items across four waves for inclusion. The demographic characteristics of the final sample (n = 12,695) appear in Table 1.

Analytic Approach

Repeated measures latent class analysis (RMCLA; Collins and Lanza 2010), a person-centered statistical approach that identifies otherwise unobservable subgroups by distinguishing similar response patterns to items of interest, was used to estimate groups based on patterns of reported attraction, behavior, and sexual identity from adolescence to adulthood. Similar to latent class analysis, sequentially specified models are fit to the data to determine the optimum number of groups that reflect the homo- and heterogeneity of reports across indicators (Muthén and Muthén 2000). Model fit is assessed using relative fit indices, such as AIC (Akaike Information Criterion), BIC (Bayesian Information Criterion),

and SABIC (sample adjusted BIC) where lower values indicate better fit. Lo-Mendell-Rubin likelihood ratio test (Lo et al. 2001), which provides a *p* value indicating whether the estimated model is a significantly better fit to the data than a model with one less latent class, was also referenced.

RMLCA was conducted using analysis type *mixture complex* in Mplus 7.0 (Muthén and Muthén 1998–2012) to account for Add Health's survey design. Once a qualified model was established, posterior probabilities, or the likelihood of an individual residing within a given class, were used to estimate most likely class membership (using individual's largest posterior probability value) and exported from Mplus 7.0 to STATA 13.1 (StataCorp 2013). Using STATA's "svy" estimation to account for Add Health's weighting, stratification, and clustering design (Chantala and Tabor 1999), ordinary least squares (OLS) regression was conducted with postestimation and contrast procedures to test mean differences between sexual trajectory groups on standardized outcomes. The most populated latent class was set as the reference group, and group means were statistically estimated using STATA's "margins" and "marginal means" commands. STATA's "subpopulation" command was also employed to correct the estimation for clustered data and improve standard errors (see Chantala 2006).

Measures

Romantic Attraction—At each wave participants were asked about their attraction to males and females (*no* = 0, *yes* = 1) either during their lifetime (W1, W3), since the last survey (W2), or currently (W4). By referencing participants' own sex, items were recoded into a single item for each wave to reflect attraction as: *no sexual attraction* = *0, different-sex attracted* = 1, *same-sex attracted* = 2, *both-sex attracted* = 3.

Romantic/Sexual Behavior—At W1 and W2 participants were asked: "In the last 18 months, have you had any special romantic relationships with anyone?" and "Not counting the people you had described as romantic relationships, have you ever had a sexual relationship with anyone?" Respondents could list up to three partners for each question (up to six partners total) and provided their sex. Participants were also asked to state the sex of additional sexual and romantic partners not listed in the original six. Romantic/sexual behavior categories were constructed with these items in conjunction with participants' self-reported sex to represent romantic/sexual behavior with partners that were *different-sex* = 1, *same-sex* = 2, and *both-sex* = 3, and those who had *no partners* = 0.

At W3, participants provided a comprehensive lifetime inventory of romantic and sexual partners, the sex of these partners, and when these relationships occurred. Due to potential overlap with W1 and W2 reports and the desire to capture stability and change in reported behavior, partners of respondents who were reported prior to and during W2 interview dates were excluded when constructing W3 romantic/sexual behavior. The same approach was used with the W4 relationship roster; only those partners listed after the W3 interview date were considered. Similar to earlier waves, W3 and W4 responses were coded in conjunction with the participants' sex to reflect behavior with *different-sex* = 1, *same-sex* = 2, or

both-sex = 3 partners. Those who reported no lifetime partners or no additional partners from those captured in previous waves were coded as *no (additional) partners* = 0.

Sexual Identity/Orientation—In W3 and W4 participants were asked to "Please choose the description that best fits how you think about yourself" with response options of *100 % heterosexual (straight)* = 1, *mostly heterosexual (straight), but somewhat attracted to people of your own sex* = 2, *bisexual—that is, attracted to men and women equally* = 3, *mostly homosexual (gay), but somewhat attracted to people of the opposite sex* = 4, *100 % homosexual (gay)* = 5, and *not sexually attracted to either males or females* = 6. Due to low frequency, those in the latter category were coded as missing.

Depressive Symptoms—Depressive symptoms (W1–W4) were measured using an abridged 9-item assessment from the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977). Respondents indicated how often they experienced certain feelings or behaviors in the previous seven days. Sample items include: "You were bothered by things that usually don't bother you," and "You had trouble keeping your mind on what you were doing". Responses ranged from *never or rarely* = 0 to *most of the time or all of the time* = 3. Scores were summed and averaged, so higher scores reflect more depressive symptomology (β was .79, .80, .80 and .81 for W1–W4, respectively).

Suicidality—Items assessing suicidality (W1–W4) asked participants (a) if they had ever seriously thought about suicide in the past 12 months (*no* = 0, *yes* = 1); (b) if any suicide attempts in the previous 12 months required medical attention (*no* = 0, *yes* = 1); and (c) the number of suicides attempted in the previous 12 months which was recoded so anyone reporting an attempt was coded as *having made an attempt* = 1; no attempts were coded as such (0). Items were summed (range 0–3), and higher scores reflect higher levels of suicidality.

Alcohol Use—Alcohol use was constructed using three items assessing self-reported frequency of drinking behaviors in the previous 12 months: general drinking ("…on how many days did you drink alcohol?"); binge drinking ("…on how many days did you drink five or more drinks in a row?"), and drunkenness ("…on how many days have you gotten drunk or "very, very high" on alcohol?"). Response options were recoded to reflect increasing use: *never* = 0, *1 or 2 days in the past 12 months* = 1, *once a month or less* = 2, *2 or 3 days a month* = 3, *1 or 2 days a week* = 3, *3–5 days a week* = 4, *every day or almost every day* = 6. Items were summed and averaged where higher scores reflect greater alcohol use (α was .90, .92, .90 and .88 for W1–W4, respectively).

Demographic Characteristics and Covariates—Participant sex (*male* = 0, *female* = 1) was used as a co-variate during RMLCA and, thus, influenced group membership (see Jung and Wickrama 2008; Collins and Lanza 2010). Covariates for OLS regressions included sex, race/ethnicity (*White* = 1, *Black or African American* = 2, *Latino* = 3, *Asian/Pacific Islander* = 4, and *Other* = 5), age in years, parental education (<*high school* = 1, *high school* = 2, *some college* = 3, and ≥*college education* = 4), receipt of public assistance (*yes* = 1), and family structure (*both biological parents* = 1, *stepfamily* = 2, *single parent headed* = 3, and *other* = 4). All covariates were measured at W1. Sex, race/ethnicity, family

structure, and socioeconomic status indicators were included as covariates, as previous research highlights the association between these variables and mental health and alcohol use for youth and adults (Ge et al. 2006; McLaughlin et al. 2012; Riolo et al. 2005). Age was included to minimize potential cohort or developmental differences.

Results

Identifying Groups: Repeated Measures Latent Class Analysis

Two- to 7-class models were run to assess fit of nominal indicators (attraction, behavior, and identity) across Waves with sex as a covariate. Preliminary analysis indicated indistinguishable model fit regardless of whether sexual identity responses *mostly homosexual gay* and *100 % homosexual (gay)* were modeled as discrete categories or collapsed; therefore, the final model was run with a four category nominal sexual identity variable (*100 % heterosexual* = 1, *Mostly heterosexual* = 2, *Bisexual* = 3, and *Mostly/100 % heterosexual* = 4) for parsimony and inter-pretability. Relative fit indices and LMR indicated that a 5-class model provided better fit to the data than either 4-or 6-class models (Table 2). Although AIC, BIC, and SABIC continued to decline in the 6-class model, the decline was less pronounced. When comparing the 5- and 6-class model proportions, all classes were replicated in the 6-class model except for one class, which post hoc follow-up confirmed had split into two separate groups that represented similar proportions of heterosexual attraction, behavior, and identities and provided no interpretable or meaningful differences. Thus, the 5-class solution provided the best estimated model.

Figure 1 displays item response probabilities for the 5-class solution. Class 1 (58.37 % of the sample) consistently reported different-sex attraction, participating in different-sex relationships even early on in W1 and W2, and largely self-identified as “100 % heterosexual” at W3 and W4. Accordingly, they were labelled *heterosexual early daters.* Class 2 (29.83 %) also consistently reported different-sex attraction and “100 % heterosexual” identities. However, unlike *heterosexual early daters,* this group had an absence of romantic/sexual partners until early adulthood (W3) and, therefore, were labelled *heterosexual late daters*.

Class 3 (6.45 %) was predominantly female and mainly reported different-sex attraction at W1, W2, and W4, but showed a marked shift in reporting same-sex attraction during W3 (17.91 % at W2 and 81.73 % at W3). They were also more likely to report same- and both-sex attraction at earlier waves than the *heterosexual early daters* and *heterosexual late daters.* Despite the rise in reported same-sex attraction at W3, there was only a modest increase in same-sex behavior (2.18 % at W2 and 5.91 % at W3). Likewise, at W3 the majority of this group adopted a “mostly heterosexual” identity, followed by a “bisexual” identity, although the proportion of these identities diminished as reports of “100 % heterosexual” identities increased at W4. Due to shifts in attraction and identity coupled with the low endorsement of same-or both-sex behavior, this group was labeled *heteroflexible*. Class 4 (3.32 %) was mostly female and endorsed consistent different-sex attraction and behavior across the first three Waves but showed a dramatic shift in attraction and identity at W4, as 0 % reported sole different-sex attraction or “100 % heterosexual” identities. Because this group was more likely to participate in same-sex relationships than *heteroflexibles,*

and the vast majority endorsed bisexual and mostly heterosexual identities at W4, this class was labelled *later bisexually identified.* Finally, class 5 (2.03 %) was labeled *LG[B] identified* and displayed a consistent trend toward both- and same-sex attraction across all four Waves. Despite a plurality of different-sex attraction and behavior at W1 and W2, this group demonstrated the largest proportion of same- and both-sex attraction and behavior in youth, and overwhelmingly reported same-sex attraction and behavior at W3 and W4. The majority of individuals also primarily reported a "100 % homosexual" or "mostly homosexual" identity. Although these trends may suggest mostly lesbian and gay identified individuals, the "[B]" was included to avoid the erasure of the both-sex attracted, behavioral, and bisexually identified individuals present within this group, albeit to a much smaller degree.

These sexual trajectory classes also differed on a number of key demographic characteristics, including sex, race/ethnicity, family structure, receipt of public assistance, parental education, and age (see Table 1).

Associations Between Sexual Trajectories, Mental Health, and Alcohol Use

Depression, suicidality, and alcohol use were transformed into *z*-scores to allow for comparisons across outcomes and to illustrate the magnitude of differences between groups. Regarding depressive symptomology, results indicated that groups differed on levels of depressive symptoms across all waves (Fig. 2; Table 3) with *heterosexual late daters* reporting the lowest prevalence of depressive symptoms at W1 and W2, followed by the *heterosexual early daters. Heteroflexible*, *later bisexually identified*, and *LG[B] identified* had significantly higher levels of depressive symptoms than *heterosexual late daters,* and *heteroflexibles* had greater depressive symptomology than *heterosexual early daters. Heteroflexible, later bisexually identified, and LG[B] identified* did not differ from one another at W1 or W2. Group comparisons on W3 depressive symptoms indicated that *heteroflexibles* reported the highest overall levels followed by *later bisexually identified* and *LG[B] identified.* Contrasts revealed that the *LG[B] identified* reported significantly more depressive symptoms than *heterosexual early daters,* but they did not differ from other groups. *Heterosexual early daters* and *heterosexual late daters* did not differ on W3 or W4 depressive symptoms and reported significantly lower depressive symptomology at W4 than the *heteroflexible* and *later bisexually identified*. *LG[B] identified* individuals only differed from *heteroflexibles* on W4 depressive symptoms.

Groups also differed on suicidality across waves (Fig. 3; Table 4) with those in the three sexual minority groups consistently reporting higher suicidality than the two heterosexual groups. At no point did the sexual minority groups differ from one another in their reported suicidality, although the extent to which they differed from the heterosexual groups varied across waves. Post hoc comparisons indicated that *heteroflexibles* consistently reported higher suicidality than *heterosexual early daters* and *late daters* (except at W4), and differences between *heterosexual early daters* and *late daters* diminished after W2. At W4 only the *later bisexually identifieds* reported significantly higher levels of suicidality than the two heterosexual groups, despite the *LG[B] identifieds* reporting the highest overall mean. This finding is explained by the greater variability in *LG[B] identified* reports, expanding the

confidence interval into both negative and positive ranges and signaling vast within-group differences in reported suicidality.

Differences in alcohol use were also observed across waves (Fig. 4; Table 5). *Heterosexual late daters* consistently reported the lowest levels of drinking behavior in adolescence and adulthood. Comparisons varied considerably across the transition to adulthood. At Wave 1, *heterosexual early daters, heteroflexible* and *later bisexually identified* classes reported more drinking behavior than the *heterosexual late daters* and *LG[B] identified.* Similar differences were present a year later at W2, except differences between *heterosexual early daters* and *LG[B] identified* were no longer significant. *Heterosexual late daters* reported lower levels of alcohol use compared to all other groups. *Heteroflexibles* also reported greater alcohol use than *heterosexual early daters.* Non-heterosexual classes did not differ in alcohol use at W3. At W4, *heteroflexible, later bisexually identified, and LG[B] identified* had higher levels of alcohol use compared to both *heterosexual early daters* and *heterosexual late daters,* who also differed from one another, with *heterosexual late daters* reporting the lowest overall use. There were no differences in W4 alcohol use between *heteroflexible, later bisexually identified, and LG[B] identified* classes.

Discussion

Minority stress theory (Meyer 2003, 2007) helps explain how individuals with socially marginalized identities (e.g., LGBQ) experience a greater threat to their mental health and well-being across developmental stages (King et al. 2008; Marshal et al. 2011). Because sexual development is a dynamic, evolving process and reported domains of sexuality (attraction, behavior, and identity) do not always agree concurrently or over time (e.g., Bostwick et al. 2010; Savin-Williams and Ream 2007), we sought to identify sexual trajectory groups based on patterns of reported romantic attraction, romantic/sexual behavior, and sexual identity/orientation from adolescence to adulthood. Our goal was to help elucidate the complex developmental nature of sexuality and its subsequent association with depressive symptoms, suicidality, and alcohol use in adolescence and across the transition to adulthood.

Informed by previous research on the development of sexuality among sexual minorities (e.g., Diamond 2008; Rosario et al. 2006;), longitudinal studies with these data (Savin-Williams and Ream 2007), and similar analysis techniques with other LGBQ samples (Fergusson et al. 2005; Talley et al. 2012), we hypothesized that at least three distinct sexual trajectory groups would emerge from the data (one consistent heterosexual group, one consistent sexual minority group, and one or more groups with variations in attraction, behavior, and identity) across the transition to adulthood. Five groups were identified, two of which reflect the sexual majority, although they differed in the timing of romantic/sexual relationships (*heterosexual early daters* and *heterosexual late daters*). Notably, three groups reflected same-sex attractions, behaviors, and sexual minority identities to varying degrees. Two of these classes were overwhelmingly female and reported discordance among attraction, behavior, and identity and marked shifts in these reports at W3 (ages 18–24) and W4 (ages 24–32) for the *heteroflexible* and *later bisexually identified,* respectively. A third group (*LG[B] identified*) reported a gradual change from predominantly different-

sex attraction and behavior at W1 to primarily same-sex attraction, behavior, and sexual minority identities at W4. The emergence of these three sexual minority groups identify both within-group differences in the concurrent and longitudinal reporting of attraction, behavior, and identity.

Research on sexual minority sexuality and identity development have oft debated the relative stability, fluidity, and path of sexual development trajectories from youth to adulthood and, more recently, how these trajectories may differ for men and women. However, this research has been criticized for the use of convenience, community, and snowball sampling techniques that yielded small samples and the reliance on retrospective reporting to help identify patterns of awareness, attraction, behavior, and identity that limit generalizability and accuracy (Savin-Williams and Cohen 2007). Using prospective reports from a nationally representative sample that followed adolescence into adulthood, our findings preliminarily support models of sexual minority maturation that reflect both linear (Cass 1979, 1984; Troiden 1989) and fluid characteristics (Diamond 2003, 2008). That is, the *LG[B] identified* group showed a steady increase in reported same- and both-sex attraction, behaviors, and sexual minority identities from youth to adulthood and greater proportions of same- and both-sex attraction during adolescence that translated in later behavior and identities that reflected these attractions. In contrast, the *heteroflexible* and *later bisexually identified* trajectories support more recent theories on the fluidity of sexuality over time (Diamond), emphasizing a “both/and” approach to understanding sexual maturation. Further, groups differed greatly in their male to female ratio, with the more dynamic trajectories (*heteroflexible* and *later sexuality fluid*) having substantially larger proportions of females (88.55 % and 90.29 %, respectively). Again, such findings support previous research on the propensity of women to report greater fluidity in their sexual identities, as well as fluidity in their attractions to and behaviors with both-sex partners and adoption of non-binary sexual identities (strictly heterosexual or strictly lesbian; e.g., Diamond 2008; Katz-Wise 2014); still, women were well represented in the *LG[B] identified* group (41.76 % female), indicating a substantial proportion of sexual minority females who also display a linear developmental trend of sexual minority attractions, behaviors and identities. Generally, the results presented here illustrate the developmental and dynamic nature of sexual development and the limitations of using one-time, single-item measures to define individual’s experiences of their own sexuality and sexual identities.

Although sexual minority mental health and substance use disparities are well established (Marshal et al. 2008, 2011), limitations in measurement and subsequent group comparisons using static, single-item measures of sexual orientation leave unanswered questions about how the intersection of sexuality constructs of attraction, behavior, and identity and their development confer risk. This leads to missed opportunities in identifying (a) who among sexual minorities are most at risk and (b) meaningful times for intervention and prevention programs geared at reducing mental health and alcohol use disparities. To address this, our second aim assessed how these sexual maturation trajectories were related to contemporaneous mental health and alcohol use outcomes across the transition to adulthood. Informed by previous research, we hypothesized that groups would differ in mental health and alcohol use outcomes across waves, with groups characterized by sexual minority attractions, behaviors, and/or identities reporting greater depressive symptomology,

suicidality, and alcohol use over time than groups identified by consistent heterosexual attractions, behaviors, and identities.

Group differences were observed in depressive symptomology and suicidality across all waves and in the expected direction. Specifically, all three sexual minority groups (*heteroflexible, later bisexually identified,* and *LG[B] identified*) experienced greater depressive symptomology and suicidality compared to groups characterized by different-sex attraction, behavior, and heterosexual identities *(heterosexual early daters* and *heterosexual late daters),* although the magnitude of these differences varied over time. The use of prospective reports afforded us a unique opportunity to examine the affiliation between sexual trajectories from adolescence to adulthood and previous mental health in adolescence. For example, *heteroflexible* and *later bisexually identified* groups overwhelmingly reported different-sex attraction and behavior in adolescence and, for the *later bisexually identified,* into early adulthood; however, their risk for depressive symptoms and suicidality during adolescence mirrored that of the *LG[B] identified* who endorsed same- and both-sex attraction in larger proportions during earlier waves.

Sexual trajectories also differed in their alcohol use across the transition to adulthood. Overwhelmingly, heterosexual youth who delayed participation in romantic relationships reported lower levels of use across all waves. These findings support previous research examining the role of romantic relationships in youth risk behavior like alcohol use (Miller et al. 2009), although this relationship may be more recursive than causal (Engels and Knibbe 2000). Interestingly, *LG[B] identified* individuals reported the lowest levels of alcohol use in adolescence and subsequently the highest levels of alcohol use in adulthood. This finding reflects an acceleration in use across the transition to adulthood, supporting previous research (Hatzenbuehler et al. 2008; Marshal et al. 2009; Newcomb et al. 2012), and highlights this transition as a particularly appropriate time to implement prevention and intervention strategies aimed at reducing excessive alcohol use within this population. The results also point to the elevated risk for those in the *heteroflexible* and *later bisexually identified* groups, as they reported greater alcohol use during both adolescence and adulthood. Further, these differences across sexual minority classes may also reflect general gender differences in risk for alcohol use among sexual minority youth (Dermody et al. 2014; Russell et al. 2002). Specifically, those in the *heteroflexible* and *later bisexually identified* groups were predominantly female and at greater risk for use compared to the *LG[B] identified* group, which had higher proportions of males. However, it is noteworthy that the risk observed in adolescence is prior to participants self-report of same- or both-sex attractions, behaviors, and non-heterosexual identities.

Although studies consistently find elevated rates of poor mental health and well-being for youth who identify as LGBQ (e.g., Marshal et al. 2011), findings here also illustrate differences in adolescent mental health and alcohol use for individuals who do not assert sexual minority attractions, behaviors, or identities until later developmental stages. These findings present a dilemma for those attempting to implement prevention and intervention programming aimed to reduce sexual minority youth mental health and alcohol use disparities, because these individuals are not acknowledging, or at the very least, expressing the acknowledgement of sexual minority attraction, behavior, or identities. Worth noting

is the emerging research demonstrating that youth who question their sexuality may be at greater risk than those who definitively identify with sexual majority or minority labels (Birkett et al. 2009; Poteat et al. 2009), and this may help explain why those who do not assert same-sex attractions, behaviors, and identities until later may also be at risk. Unfortunately, response options for questioning one's attractions and/or identities was not available in Add Health and, therefore, cannot be tested empirically with this sample. Regardless of whether these *heteroflexible* and *later bisexually identified* individuals do not acknowledge these attractions, behaviors, or identities until adulthood, or they are in a state of questioning these dimensions of their own sexuality, their elevated risk for depressive symptomology, suicidality, and alcohol use deserves attention. School programming and LGBQ inclusive curriculums (see Snapp et al. 2015, in press) that advocate acceptance and provide sexual and gender minority education may prove useful, as they would reach all students, some of whom have yet to acknowledge or recognize same-sex attractions and sexual minority identities. At the very least, schools should institute policies and provide training on sexual orientation, gender identity, and bias-based victimization and encourage the presence of Gay/Straight Alliances, as these are known to foster more inclusive and supportive environments for sexual minority and questioning youth (Goodenow et al. 2006; Hatzenbuehler et al. 2014; Russell et al. 2010).

Following adolescence, our results indicated that the three sexual minority groups displayed divergent mental health and alcohol use patterns. Specifically, *heteroflexibles* remained the highest at-risk group for depressive symptomology in adulthood, displayed high risk for suicidality in early adulthood, and the lowest levels of suicidality compared to the other sexual minority trajectory by ages 27–32 (W4). Differences in depressive symptomology and suicidality between heterosexual groups and the *later bisexually identified* and *LG[B] identified* classes diminished in the transition to early adulthood (W3), but increases again among the *later bisexually identified* at ages 27–32 (W4)—when reports of same-sex attraction and nonheterosexual identities increased. Finally, *LG[B] identifieds* indicated the fewest depressive symptoms in adulthood compared to the *heteroflexible* and *later bisexually identified*, but their levels of suicidality and alcohol use rivaled that of the *later bisexually identified* at W4. Because the *LG[B] identifieds* were more likely to be male, and the *heteroflexible* and *later bisexually identified* groups were predominately female, these difference in outcomes may reflect a gender effect.

Importantly, these shifts in mental health and alcohol use occurred in tandem with the acknowledgement of sexual minority attractions, behaviors and/or identities. When *heteroflexibles* and *later bisexually identifieds* groups recognized (or shifted to) sexual minority attractions and identities in greater proportions (W3 and W4, respectively), their risk for experiencing depressive symptoms and alcohol use increased. Such findings suggest that those who lag in their awareness or assertion of sexual minority attraction or do not integrate this into their identity until later developmental stages may be at particular risk for symptoms of depression and extreme alcohol use in adulthood. A similar pattern emerged for suicidality. Although *heteroflexible* and *later bisexually identified* youth suicidality reports paralleled those of the *LG[B] identified*, in adulthood these groups were at greater risk for suicidality during the waves in which they shifted reports to include sexual minority attractions and identities. These results support previous research demonstrating

an increased risk for poor mental health following the adoption of a stigmatized identity (Ueno 2010). As such, researchers may want to consider that the timing of coming out or the timing of reported (or awareness of) same-sex attractions and behavior may influence outcomes. Preliminarily, results here suggest that those who recognize and adopt sexual minority attractions, behaviors, and identities first in adulthood are at risk during adolescence but also remain at greater risk for depressive symptoms and suicidality at this time compared to those who debut earlier. These findings support results from Russell et al. (2014b) that highlight the positive implications of coming out in high school for later psychosocial wellbeing and emphasize the importance of implementing inclusive policies and programs that nurture LGBTQ youth development and expression.

Despite its contributions, the current study has a number of limitations. Although the use of a nationally representative dataset with prospective reporting was a strength of this study, we were restricted by their use in a number of ways. First, sexual identity was not measured prior to the transition to adulthood (W1 and W2); therefore, we were unable to assess the congruence with youth attraction and behavior or the development of identity across this transition. Second, a number of individuals across groups expressed same-sex attraction and bisexual or mostly heterosexual identities but did not participate in behavior with same-sex partners. This, coupled with the fact that we are unaware of whether or when these individuals express these attractions, identities, and behaviors with family or friends, may have important implications for mental health and alcohol use. Minority stress theory asserts the role of social identity and how the self-identification as a member of a marginalized group can leave one vulnerable to the unique minority stressors of said group (biased victimization, discrimination, and prejudice). Conversely, some posit that the denial of a sexual minority identity or desires may also contribute to poor mental health and maladaptive coping strategies. Although we cannot explore these hunches here, future research may benefit from investigating these sexual minority specific experiences in tandem with developmental trajectories of attraction, behavior, and/or identity.

Third, we cannot contextualize or elaborate these observed transitions. For example, we cannot determine whether individuals who asserted same-sex attraction, behavior, and sexual minority identity in adulthood were grappling with or unaware of their sexuality in adolescence. We also cannot assume that certain intrapersonal or sociocultural factors discouraged these individuals from reporting attractions and identities prior to adulthood, or that their life circumstances encouraged them to reevaluate their attractions, behaviors, and sexual identities in adulthood. For instance, research suggests that females typically assert attractions to same-sex partners in the presence of a close, emotionally intimate relationship, whereas males typically report experiencing sexual thoughts about or arousal towards same-sex peers prior to engaging in relationships (e.g., Diamond 2008; Savin-Williams and Cohen 2007). Current research in this area (Diamond 2008; Katz-Wise 2014) helps to contextualize some of these transitions and developments for adult women and to a lesser extent men, but more research is needed with youth, over longer periods, and with more diverse and generalizable samples.

Also noteworthy is the recent discourse regarding the validity of a subset of respondents in Add Health who reported same-sex attractions in W1 but identified as “100 % heterosexual”

at W4 (Savin-Williams and Joyner 2014a, b). The presence of these potentially inaccurate (or mischievous) responders are hypothesized to inflate the number of individuals reporting same-sex attractions, particularly in W1 and W2. The possible presence of these inaccurate responders, regardless of their motivations, requires researchers to be cognizant of the implications of findings when using these data to explore associations with romantic attractions (as we do here). However, this notion of inaccurate responders has been repeatedly challenged (e.g., Katz-Wise et al. 2015; Li et al. 2014), and a rigorous empirical investigation into these "mischievous" responders (for techniques see Robinson-Cimpian 2014) has not yet occurred. In fact, the analysis used here (RMLCA) takes into account the variability of responses to multiple concurrent items (attraction, behavior, and identities) across various time points. Therefore, the individuals who (potentially) falsely report same-sex attraction earlier are most likely represented in the small proportions of observed same-sex attraction in W1 and W2 of the *heterosexual early daters* and *heterosexual late daters.*

Like this study, many studies compare heterosexual and sexual minority groups on outcomes. Yet, our findings also illuminate within-group differences that confer differential risk on outcomes, although the small size of the sexual minority groups in comparison to the heterosexual groups likely influenced estimates. For example, confidence interval ranges for sexual minority group means were much wider, especially for the *LG[B] identified.* This subsequently made difficult within-group difference testing of sexual minority trajectory groups, as these confidence intervals often overlapped despite the magnitude of difference in overall mean. Also, we did not assess how these trajectories intersect with youth and adult contexts in ways that could protect or exacerbate poor mental health outcomes (family relationships, school climate, friendship and peer networks, work environments, sexual minority specific stressors, etc.). The investigation of how these contexts interact with developmental trajectories will help inform prevention, intervention, and policy directed towards improving sexual minority mental health and well-being.

Conclusion

Compared to sexual majority youth and adults, LGBQ health disparities are evident. However, there is great variability among sexual minorities in their mental health and alcohol use, with the vast majority showing positive psychosocial adjustment and well-being (Saewyc 2011). For this reason, it is essential to move beyond the heterosexual versus LGBQ disparities framework and explore within-group differences among sexual minorities to determine who may be more or less at risk for poor outcomes. Similarly, deviating from static, single-item measures of sexual orientation when assessing risk for outcomes is crucial, if we are to demonstrate how timing and trajectory differences elucidate risk for poor mental health and excessive alcohol use. Our results demonstrate the value of these considerations and approaches by identifying three distinct sexuality trajectories from adolescence to adulthood among sexual minorities. Notably, these unique sexual trajectories varied in their reported mental health and alcohol use during adolescence and young adulthood, indicating that sexual maturation is an important factor to consider when assessing risk for poor mental health, the timing of risk, and the factors that contribute to overall well-being for sexual minorities. The results presented here regarding the timing of risk showed that those who first reported same-sex attraction and sexual minority identities

during adult waves indicated similar levels of depressive symptomology and suicidality to those youth who reported same-sex attraction and behaviors during adolescence. Further, later changes in reported attraction, behavior, and identity for these groups were associated with worsening mental health in adulthood. These findings hint at the benefits of LGBTQ inclusive policy, programming, and curriculums for youth and demonstrate the potential protective function of early acknowledgement of sexual minority attractions and identities on later psychosocial adjustment.

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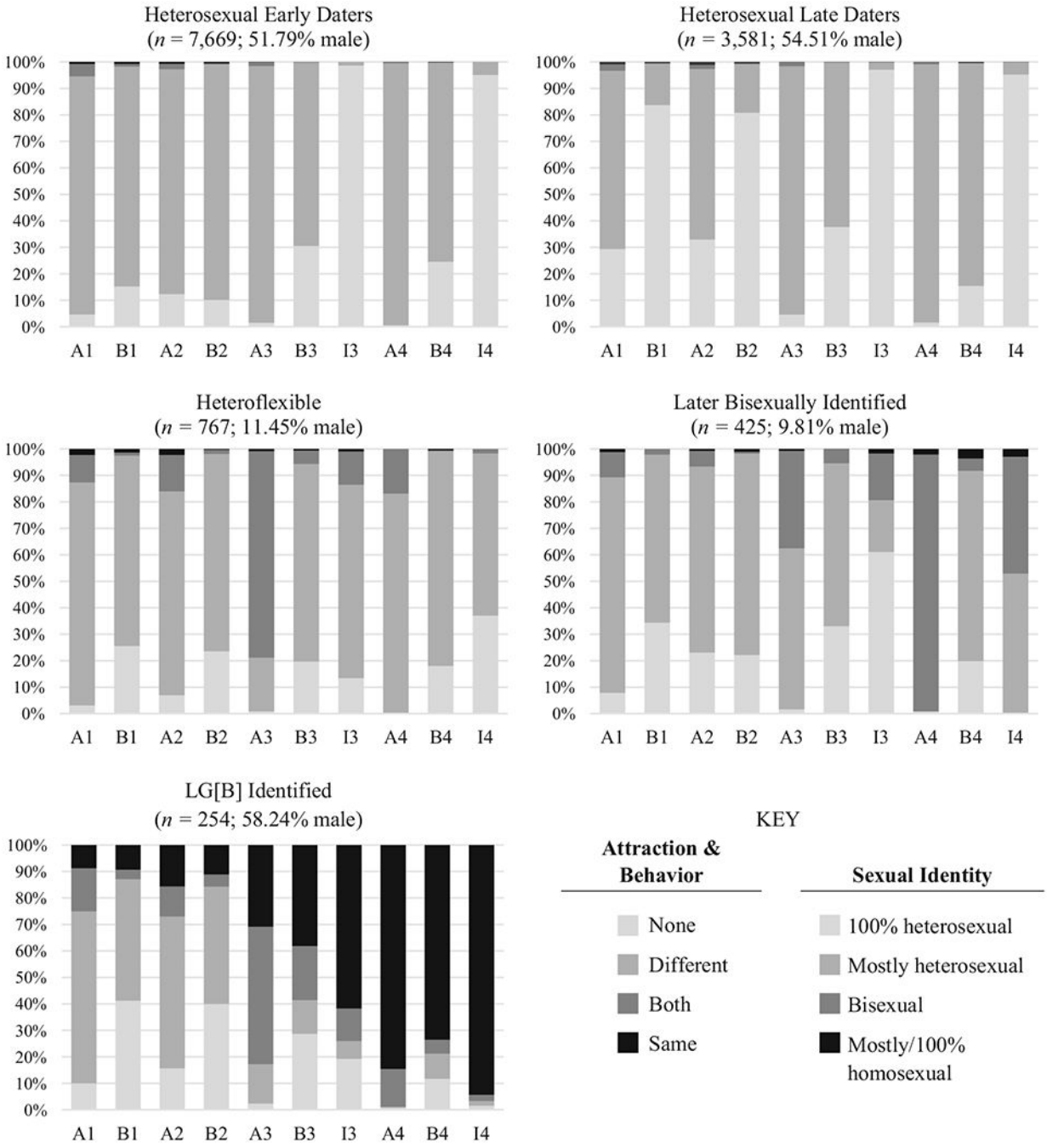

Fig. 1.

Class probabilities and item probabilities of attraction, behavior, and identity by class. Note A1–A4 = W1–W4 romantic attraction, respectively; B1–B4 = W1–W4 romantic/sexual behavior, respectively; I3 and I4 = W3 and W4 identity, respectively

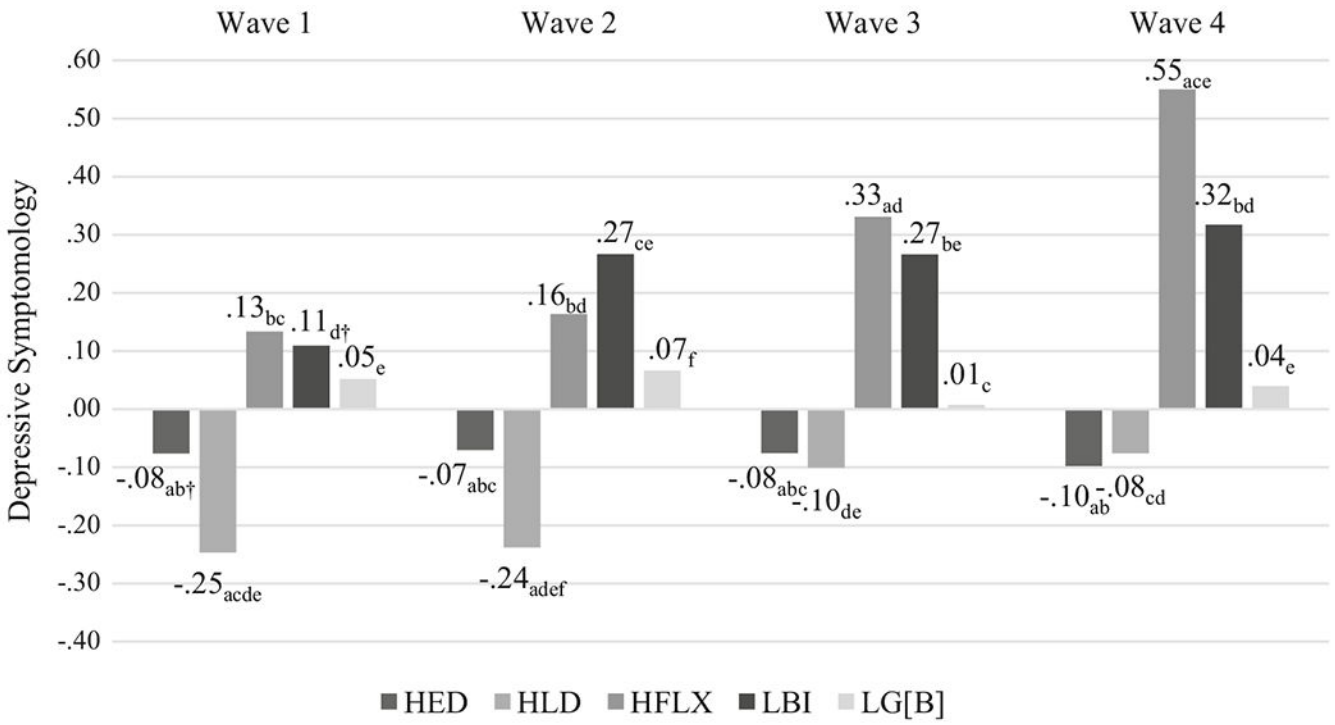

Fig. 2.

Sexual trajectory class comparison of depressive symptomology (standardized) across waves. *Note: HED* heterosexual early daters, *HLD* heterosexual late daters, *HFLX* heteroflexible, *LBI* later bisexually identified, *LG[B]* LG[B] identified. Covariates include age, sex, family structure, race/ethnicity, parental education, and receipt of public assistance. Mean comparisons presented as *z*-scores. Standardized means with the corresponding subscripts are statistically different within wave at $p < .05$, $^{\dagger}<.10$. Effect size for comparisons were: W1 $d_a = .10$, $d_b = .12$, $d_c = .29$, $d_d = .28$, $d_e = .24$; W2 $d_a = .11$, $d_b = .14$, $d_c = .21$, $d_d = .38$, $d_e = .23$; W3 $d_a = .23$, $d_b = .20$, $d_c = .05$, $d_d = .29$, $d_e = .26$; W4 $d_a = .38$, $d_b = .24$, $d_c = .39$, $d_d = .24$, $d_e = .33$. Effect size calculated as (mean $class_1$ – mean $class_2$)/SD pooled. Effect sizes are likely overestimates due Add Health's weighted and survey design. Effect sizes are displayed as absolute value for ease

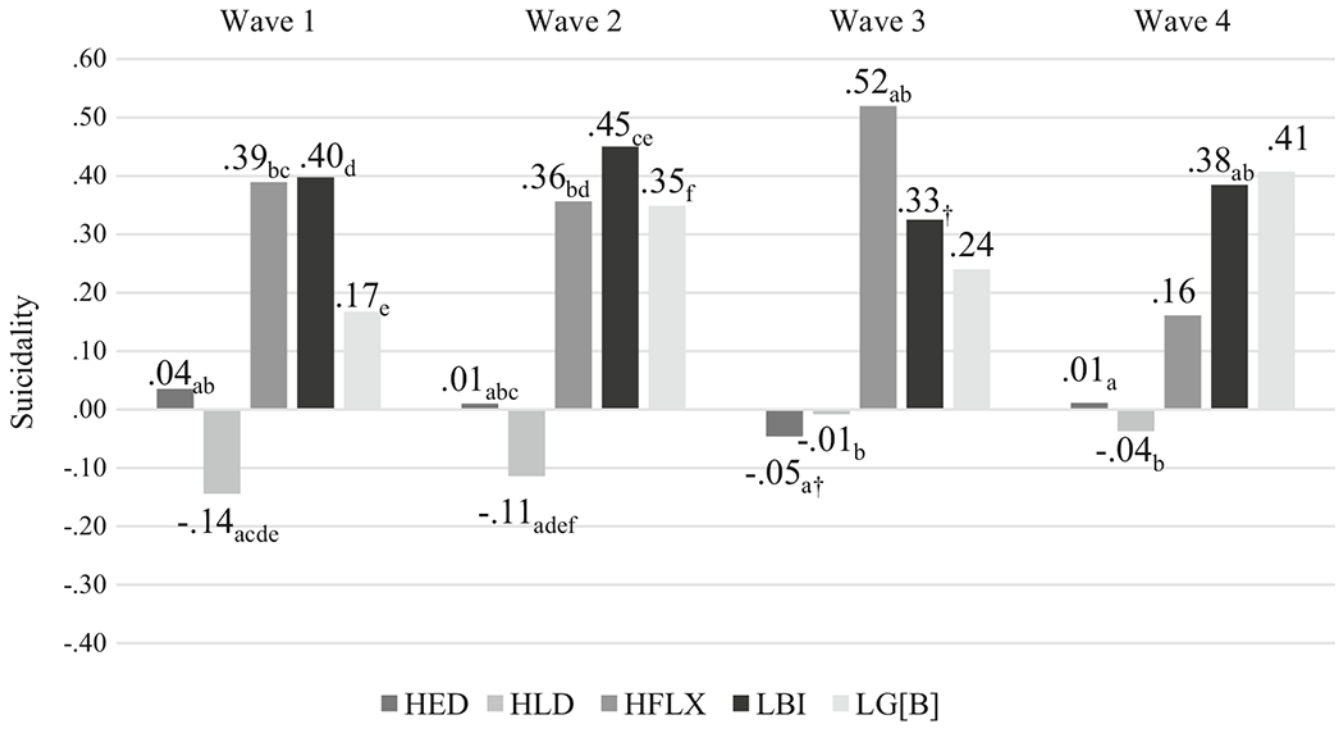

Fig. 3.

Sexual trajectory class comparison of suicidality (standardized) across waves. *Note: HED* heterosexual early daters, *HLD* heterosexual late daters, *HFLX* heteroflexible, *LBI* later bisexually identified, *LG[B]* LG[B] identified. Covariates include age, sex, family structure, race/ethnicity, parental education, and receipt of public assistance. Mean comparisons presented as *z*-scores. Standardized means with the corresponding subscripts are statistically different within wave at $p < .05$, †<.10. Effect size for comparisons were: W1 $d_a = .13$, $d_b = .23$, $d_c = .44$, $d_d = .49$, $d_e = .43$; W2 $d_a = .09$, $d_b = .23$, $d_c = .29$, $d_d = .41$, $d_e = .49$, $d_f = .43$; W3 $d_a = .38$, $d_b = .32$; W4 $d_a = .21$, $d_b = .25$. Effect size calculated as (mean $class_1$ – mean $class_2$)/SD pooled. Effect sizes are likely overestimates due Add Health's weighted and survey design. Effect sizes are displayed as absolute value for ease

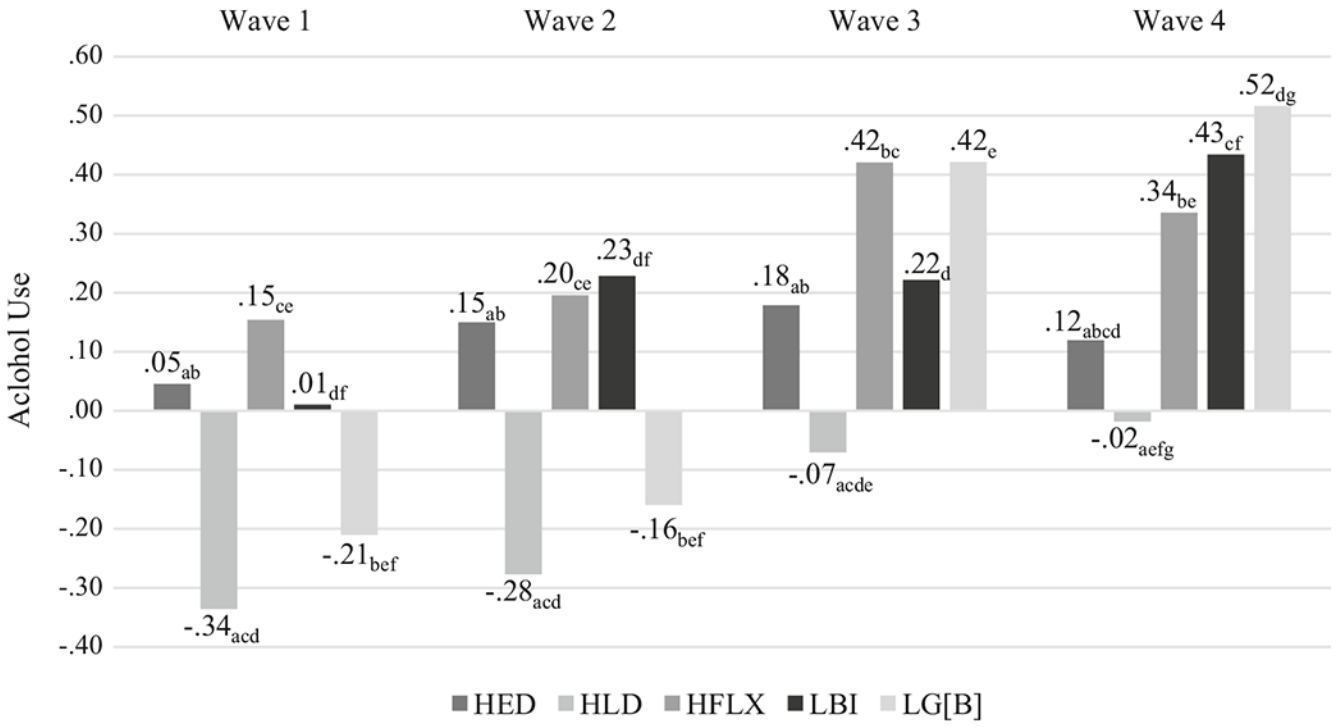

Fig. 4.

Sexual trajectory class comparison of alcohol use (standardized) across waves. *Note: HED* heterosexual early daters, *HLD* heterosexual late daters, *HFLX* heteroflexible, *LBI* later bisexually identified, *LG[B]* LG[B] identified. Covariates include age, sex, family structure, race/ethnicity, parental education, and receipt of public assistance. Mean comparisons presented as *z*-scores. Standardized means with the corresponding subscripts are statistically different within wave at $p < .05$, $^{\dagger}<.10$. Effect size for comparisons for W1 $d_a = .19$, $d_b = .11$, $d_c = .43$, $d_d = .32$, $d_e = .28$, $d_f = .22$; for W2 $d_a = .20$, $d_b = .17$, $d_c = .38$, $d_d = .39$, $d_e = .30$, $d_f = .26$; for W3 $d_a = .10$, $d_b = .09$, $d_c = .27$, $d_d = .16$, $d_e = .26$; for W4 $d_a = .06$, $d_b = .10$, $d_c = .14$, $d_d = .17$, $d_e = .19$, $d_f = .23$, $d_g = .27$. Effect size calculated as (mean $class_1$ – mean $class_2$)/SD pooled. Effect sizes are likely overestimates due Add Health's weighted and survey design. Effect sizes are displayed as absolute value for ease

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Table 1

Demographic characteristics at Wave 1 and comparisons across sexual trajectory classes (N = 12,695)

	Total sample			Comparisons across sexual trajectory classes (%)					
	Raw *n*	Raw %	Weighted %	HED	HLD	HFLEX	LBI	LG[B]	χ^2
Sex									96.80***
Male	6003	47.29	48.87	51.79	54.51	11.94	9.81	58.24	
Female	6692	52.71	51.13	48.21	45.49	88.06	90.19	41.76	
Race/ethnicity[a]									6.28***
White	6749	53.34	67.68	68.65	63.56	76.33	71.50	63.54	
Black/African American	2534	20.03	14.15	14.37	15.52	6.75	10.97	16.06	
Latino	1856	14.67	10.15	9.63	11.25	9.29	9.60	14.05	
Asian/Pacific Islander	770	6.09	3.13	2.22	5.66	2.13	1.00	1.85	
Other	743	5.87	4.89	5.13	4.02	5.50	6.93	4.50	
Family structure									5.93***
Biological two-parent	6802	53.58	55.92	53.53	63.20	52.27	47.02	51.15	
Stepfamily	2336	18.40	17.37	18.68	13.64	19.83	20.96	16.83	
Single parent headed	3031	23.88	22.74	23.32	20.31	24.11	27.42	27.29	
Other	526	4.14	3.98	4.47	2.85	3.79	4.60	4.73	
Parental education									2.88**
<High school	1410	11.62	11.08	10.11	12.92	9.27	15.10	13.58	
High school	3627	29.89	32.12	32.33	32.93	24.70	34.43	33.16	
Some college	2546	20.98	21.68	22.94	19.20	20.79	21.12	21.52	
≥College degree	4551	37.51	35.12	34.62	34.94	45.24	29.35	31.74	
Receipt of public assistance									3.45*
No	10,152	90.90	90.45	91.01	89.70	91.67	83.35	92.32	
Yes	1016	9.10	9.55	8.99	10.30	8.33	16.65	7.68	
				Comparisons across sexual trajectory classes					
				HED	HLD	HFLEX	LBI	LG[B]	*F*
Age				15.75[abc]	15.03[ade]	15.48[bd]	15.30[c]	15.52[e]	68.14***
Parental education				2.82[a]	2.76[b]	3.02[abc]	2.65[c]	2.71	4.68**

HED heterosexual early daters, *HLD* heterosexual late daters, *HFLX* heteroflexible, *LBI* later bisexually identified, *LG[B]* LG[B] identified Weighted proportions were estimated using survey (*svy*) procedures in Stata/SE 13.1 to reflect actual population proportions as accurately as possible

Superscripts for age and parental education denote significant mean differences at $p < .05$,

†denotes differences at $p < .10$

^{a}Race/ethnicity categories American Indian/Alaska Native, Other, and Multiracial/Multiethnic were collapsed into "Other"

Table 2

Relative model fit by number of classes

Classes	Log likelihood	AIC	BIC	SABIC	Entropy	LMR
2	−92,444.80	124,273.66	124,735.49	124,538.46	0.93	75,365.02, $p < .01$
3	−89,767.62	120,742.31	121,442.51	121,143.79	0.76	61,226.47, $p < .01$
4	−87,561.88	117,844.10	118,782.67	118,382.25	0.80	58,949.91, $p < .01$
5	−86,988.75	117,138.40	118,315.34	117,813.23	0.83	55,484.12, $p < .01$
6	−86,475.66	116,513.35	117,928.65	117,324.85	0.80	55,950.21, $p = .74$

AIC Akaike information criterion, *BIC* Bayesian information criterion, *SABIC* sample size adjusted BIC, *LMR* Lo-Mendell-Rubin likelihood ratio test

Table 3

Ordinary least squares regression results of depressive symptomology across waves

	Wave 1			Wave 2			Wave 3			Wave 4		
	B	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**
Sexual trajectory group												
Heterosexual early daters (ref)												
Heterosexual late daters	−.08***	.01	−.11, −.06	−.08***	.01	−.11, −.05	−.01	.01	−.04, .02	.01	.02	−.03, .05
Heteroflexible	.10**	.03	.04, .16	.11***	.03	.05, .17	.19***	.03	.12, .25	.29***	.03	.23, .36
Later bisexually identified	.09*	.03	.02, .16	.16***	.04	.09,.23	.16***	.04	.08, .23	.19***	.05	.10, .28
LG[B] identified	.06	.04	−.02, .14	.06	.04	−.02, .15	.04	.05	−.06, .14	.06	.04	−.02, .14
Age	.03***	.00	.02, .04	.02***	.00	.01, .03	−.00	.00	−.01, .01	−.01	.01	−.02, .00
Sex	.13***	.01	.11, .16	.14***	.01	.12, .16	.07***	.01	.05, .10	.07***	.01	.04, .09
Family structure												
Biological two-parent (ref)												
Stepfamily	.07***	.02	.04, .10	.06***	.02	.03, .10	.03	.02	−.01, .08	.01	.02	−.02, .05
Single parent headed	.06***	.02	.03, .09	.07***	.02	.04, .10	.03	.02	−.01, .07	.04*	.02	.00, .08
Other	.08*	.03	.01, .14	.11*	.05	.02, .21	.09†	.05	−.01, .19	.16***	.05	.06, .25
Race/ethnicity												
White (ref)												
Black/African American	.08***	.02	.03, .12	.07**	.02	.03, .11	.11***	.02	.06, .15	.08**	.02	.03, .12
Latino	.06*	.02	.01, .10	.09***	.03	.04,.14	.04	.02	−.01, .09	.07**	.03	.02, .13
Asian/Pacific Islander	.17***	.04	.09, .25	.19***	.04	.10, .27	.09*	.04	.01, .17	.10**	.04	.03, .17
Other	.06*	.03	.01, .11	.08*	.03	.02, .14	.08**	.03	.02, .14	.04	.03	−.02, .12
Parental education	−.05***	.01	−.06, −.04	−.05***	−.01	−.06, −.04	−.05***	−.01	−.06, −.03	−.03***	.01	−.04, −.01
Public assistance	.07**	.03	.02, .12	.05†	.02	−.00, −.09	.06†	.03	−.01, .12	.02	.03	−.03, .07
Constant	.43***	.08	.28, .58	.51***	.08	.35, .67	.89***	.08	.72, 1.06	.80***	.09	.63, .98
F^a	18.93***			23.69***			12.60***			27.10***		

OLS regressions were estimated using *svy* and *subpopulation* procedures in Stata/SE 13.1. Wave 1 n = 10,678; Wave 2 n = 9330; Wave 3 n = 7207; Wave 4 n = 7181

$^{*}p < .05$

$^{**}p < .01$

$^{***}p < .001$

$^{\dagger}p < .10$

[a] Statistical comparison of sexual trajectory groups

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Table 4

Ordinary least squares regression results of suicidality across waves

	Wave 1			Wave 2			Wave 3			Wave 4		
	B	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**
Sexual trajectory group												
Heterosexual early daters (ref)												
Heterosexual late daters	−.09***	.01	−.12, −.06	−.06***	.01	−.09, −.03	.01	.02	−.01, .04	−.02	.01	−.04, .01
Heteroflexible	.18***	.04	.10, .26	.16***	.03	.10, .23	.20***	.04	.12, .28	.05	.03	−.01, .11
Later bisexually identified	.19*	.08	.02, .35	.21***	.06	.10, .32	.13**	.05	.03, .23	.12**	.04	.05, .20
LG[B] identified	.07	.05	−.03, .16	.16*	.06	.03, .29	.10*	.04	.02, .18	.13*	.06	.02, .24
Age	.01	.00	−.00, .02	−.01*	.00	−.02, −.00	−.01**	.00	−.02, −.00	−.00	.00	−.01, .01
Sex	09***	.01	.06, .12	.08***	.01	.05, .10	.00	.01	−.02, .02	.01	.01	−.02, .03
Family structure												
Biological two-parent (ref)												
Stepfamily	.05**	.02	.02, .09	.04*	.02	.01, .07	.03*	.02	.00, .07	.03†	.02	−.00, .07
Single parent headed	.04†	.02	−.00, .08	.03†	.02	−.00, .07	.02	.01	−.01, .04	.03†	.02	−.00, .06
Other	.06	.04	−.02, .14	.10†	.05	−.00, .20	.04	.04	−.03, .12	.06	.04	−.02, .13
Race/ethnicity												
White (ref)												
Black/African American	−.05**	.02	−.08, −.01	−.06***	.02	−.10, −.03	−.03†	.01	−.05, .00	−.01	.02	−.05, .02
Latino	−.01	.02	−.6, .04	−.03	.02	−.06, .01	−.01	.02	−.04, .02	−.01	.01	−.04, .02
Asian/Pacific Islander	−.00	.03	−.07, .06	.03	.05	−.06, .12	−.04†	.02	−.09, .00	−.04	.02	−.09, .01
Other	.06†	.04	−.01, .13	.02	.03	−.04, .08	.02	.02	−.02, .06	−.02	.02	−.06, .01
Parental education	.01	.01	−.01, .02	−.00	.01	−.02, .01	.01	.01	−.00, .02	−.01	.01	−.02, .01
Public assistance	.02	.03	−.04, .09	.00	.02	−.04, .05	−.00	.02	−.04, .3	.02	.03	−.03, .07
Constant	.00	.08	−.15, .15	.28***	.07	.13, .42	.21***	.06	.08, .34	.10	.07	−.03, .24
F^a	29.17***			15.40***			9.57***			6.25***		

OLS regressions were estimated using *svy* and *subpopulation* procedures in Stata/SE 13.1. Wave 1 n = 10,626; Wave 2 n = 9317; Wave 3 n = 7993; Wave 4 n = 7178

$^{*}p < .05$

$^{**}p < .01$

$^{***}p < .001$

$^{\dagger}p < .10$

[a] Statistical comparison of sexual trajectory groups

Table 5

Ordinary least squares regression results of alcohol use across waves

	Wave 1			Wave 2			Wave 3			Wave 4		
	B	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**	***B***	**SE$_B$**	**95 % CI**
Sexual trajectory group												
Heterosexual early daters (ref)												
Heterosexual late daters	−.47***	.04	−.54, −.40	−.56***	.04	−.65, −.47	−.36***	.04	−.45, −.27	−.19***	.05	−.30, −.09
Heteroflexible	.13†	.07	−.00, .27	.06	.08	−.09, .21	.35***	.09	.18, .52	.30***	.09	.13, .48
Later bisexually identified	−.04	.08	−.20, .11	.10	.12	−.14, .34	.06	.11	−.15, .28	.44***	.13	.19, .70
LG[B] identified	−.32***	.08	−.48, −.15	−.41***	.11	−.63, −.18	.35*	.16	.04, .66	.56**	.19	.19, .93
Age	.18***	.01	.16, .20	.16***	.01	.13, .19	.01	.02	−.02, .05	−.07***	.02	−.10, −.03
Sex	−.15***	.03	−.21, −.09	−.20***	.04	−.28, −.13	−.65***	.04	−.73, −.57	−.61***	.04	−.70, −.52
Family structure												
Biological two-parent (ref)												
Stepfamily	.13**	.05	.04, .22	.06	.04	−.03, .14	−.08	.05	−.19, .02	.03	.07	−.10, .16
Single parent headed	.21***	.04	.13, .29	.15***	.05	.06, .24	−.06	.05	−.16, .04	.01	.05	−.08, .11
Other	.17†	.10	−.03, .38	.04	.10	−.16, .25	−.23*	.10	−.43, −.02	−.11	.12	−.35, .13
Race/ethnicity												
White (ref)												
Black/African American	−.28***	.06	−.40, −.16	−.45***	.06	−.57, −.33	−.84***	.06	−.96, −.71	−.62***	.06	−.74, −.49
Latino	−.09†	.05	−.19, .12	.04	.08	−.13, .20	−.28***	.07	−.41, −.14	−.14†	.08	−.29, .01
Asian/Pacific Islander	−.27**	.10	−.48, −.07	−.39**	.12	−.63, −.14	−.64***	.16	−.95, −.32	−.50***	.12	−.75, −.26
Other	.03	.06	−.09, .15	.01	.08	−.14, .16	−.24*	.10	−.43, −.06	−.07	.13	−.32, .18
Parental education	−.03†	.02	−.06, .00	−.01	.02	−.05, .03	.22***	.03	.16, .27	.18***	.02	.13, .23
Public assistance	−.01	.05	−.12, .10	−.16*	.07	−.29, −.03	−.33***	.07	−.46, −.20	−.11	.09	.28, .06
Constant	−1.82***	.19	−2.20, −1.43	−1.31***	.24	−1.78, −.84	1.44***	.29	.87, 2.02	2.55***	.30	1.95, 3.14
F^a	66.76***			54.14***			22.93***			10.51***		

OLS regressions were estimated using *svy* and *subpopulation* procedures in Stata/SE 13.1. Wave 1 n = 10,651; Wave 2 n = 9295; Wave 3 n = 8107; Wave 4 n = 7181

$^{*}p < .05$

$^{**}p < .01$

$^{***}p < .001$

$^{\dagger}p < .10$

[a] Statistical comparison of sexual trajectory groups