SEXUAL ORIENTATION IDENTITY CHANGE AND MENTAL HEALTH: A LONGITUDINAL ANALYSIS

Bethany Everett
Assistant Professor
University of Illinois at Chicago

September 21, 2012

ABSTRACT

Using the National Longitudinal Study of Adolescent Health (Add Health), this study examines the relationship between changes in sexual orientation identity between adolescence and young adulthood and depressive symptoms. I employ multivariate regression, as well as propensity score matching techniques to examine the effect of not only identity change on mental health outcomes, but also how the effect of change varies by the propensity to change sexual orientation identities. The results reveal that only shifts toward more same-sex oriented identities are associated with increases in depressive symptoms and that the negative impacts of identity change are concentrated among individuals with the lowest propensity scores to change identities.

Several studies have demonstrated that sexual minorities have an elevated risk for poorer mental health (Garofalo et al. 1999; Hershberger, Pilkington, and D'Augelli 1997; Remafedi et al. 1991; Russell 2003). This paper adds to the existing literature by investigating whether changes in sexual orientation identity over time have an impact on mental health. Social psychologists have proposed two primary pathways through which mental health disparities by sexual orientation are manifested: minority stress (Meyer 2003, 2010) and sexual identity development (Cass 1979; Coleman 1982; Troiden 1989). While the first has received considerable attention, and multiple studies have shown that victimization, discrimination, and internalized homophobia are indeed key factors in shaping mental health outcomes among sexual minorities (Herek, Capitanio, and Windaman, 2002; Herek, 1993, 2009; Huebner, Rebchook, and Kegeles 2004; Pilkington and D'Augelli, 1995; Rostosky, et al., 2003; Russell, Seif, and Truong, 2001; Savin-Williams, 1994), much less work has tested whether differences in the timing and pattern of sexual identity development are associated with mental health disparities. This chapter, therefore, focuses specifically on the effect of changing sexual orientation identities in young adulthood on depression, stress, and anxiety.

While there are multiple dimensions of sexual orientation, such as attraction and behavior, this chapter focuses explicitly on sexual orientation identities, and identity change, for several reasons. A sexual minority identity is somewhat unique from other minority group identities, such as race/ethnic minorities, insofar as sexual minorities are not usually born into a community of same-sex oriented persons. Rather, most children are born into heterosexual households whose opinions and 'approval' of homosexuality may vary from household to household. Sexual minorities, therefore, are often not socialized in the family, school, or community setting on how to form a healthy bisexual or gay identity. Indeed, forming a healthy

sexual identity is a difficult process for adolescents in general; however, for sexual minorities, these processes often occur within a larger homophobic cultural context (Bell and Valentine 1995; D'Augelli and Hart 1987; Kosciw, Greytak, and Diaz 2009; Poon and Saewyc 2009).

Individuals do not live in social vacuums; rather, people exist within larger social environments that provide a set of norms and values that reflect the dominant cultural ideals. Related to sexual orientation, heteronormative environments reflect heterosexual standards regarding sexual identities, sex, and romantic partnerships. Sexual minorities are consistently exposed to heteronormative messages regarding sexual relationships and romantic partnerships that stigmatize their sexual orientation (Herek 2002, 2009; Herek, Cogan, and Gillis 2002). Adopting a sexual minority identity, therefore, may offer sexual minorities a new social identity group that provides an alternative set of norms and values that legitimate a sexual minority sexual orientation, thereby improving psychological functioning by aligning internal values with the external values provided by one's social group (Burke 1980, 1991; Burke and Tully 1977). A sexual minority social identity may also improve mental healthy by providing sexual minorities with a sense of community and a new set of social resources (Ramirez-Valles, 2002; Rosario et al. 2006, 2011).

Identity Formation/Identity Change Theory

The process of forming and maintaining a social identity has been characterized as a feedback loop through which individuals strive to maintain congruency between the identity standard, which is the set of meanings attached to an identity, and their own perceptions or 'self-meaning' of how they are performing an identity according to the relevant standards of a specific identity (Burke 1980, 1991; Burke and Tully 1977). Through this continuous, reflexive process,

individuals strive to maintain alignment between the standard and their own evaluation that they are performing the identity standard correctly. When there is a discrepancy between the standard and the performance, individuals will often realign their behavior with the normative behavioral expectation associated with the identity-standard in a process that is called identity-verification (Burke 2006). That is, people strive to engage in behaviors whose shared meanings reflect those of the identity standard (Burke and Reitzes 1981).

This chapter focuses on the effect of identity change on mental health. Using Identity Control Theory (ICT), Burke (2006) posits that there are two circumstances under which individuals change identities: First, identity change happens due to changes in the self-response; that is, when individuals realign their identity with the self-meaning by changing their identity. For example, if one is engaging in same-sex sexual relationships and yet maintaining a heterosexual identity, the schism between the identity standard for heterosexuals and the individual's behavior will force the individual to change one's identity to reduce the gap between the identity standard and their behavior. The second way identities are changed is through the social meaning of the identity. For example, if definitions of heterosexual behavior over time have become more relaxed such that engaging in a same-sex sexual relationship is no longer a violation of that heteronormative identity standard, then persons who may have previously identified as bisexual may reconsider their identity and label themselves as heterosexual. It may be that, particularly among women, increases in the social acceptability of same-sex attraction may be related to changes toward less same-sex oriented sexual orientation identities in young adulthood.

The extent to which changes in sexual orientation identity affect mental health, however, are largely unknown. While the end-goal of the process of changing an identity is ultimately to

decrease distress by reducing the discrepancy between behavior and the identity standard (Burke and Harrod 2005; Cast and Burke 2002), it should be noted that changing one's identity is not an easy process. To quote Burke (1996), "Identity change involved changes in the meaning of the self: changes in what it means to be who one is as a member of a group, who one is in a role, or who one is as a person" (92). "Even in cases where change reduces discrepancy, psychological distress may occur as "there are always some undesirable elements in the alternative that was chosen, and some elements in the alternative that was rejected which are nevertheless desirable" (Burke 2006:94).

In addition to identity change theory, sexual orientation development scholars have posited that specific stages of identity development are associated with differences in mental health outcomes (Cass 1979; Coleman 1982; Troiden 1989). As reviewed in Chapter 1, these models suggest that the period during which individuals experience same-sex attraction, relationships, or sex, and maintain a heterosexual identity, is a period where psychological distress is elevated. While these models have been critiqued for their linear characterization of gay-identity development and lack of recognition of bisexuality as an end-stage, the process of identity change, either to a gay, heterosexual, or bisexual identity, may indeed be a period associated with poorer mental health outcomes.

Identity change toward a more same-sex oriented identity may also be related to, at least in the short term, poorer mental health due to its highly stigmatized nature. Indeed, while adopting a sexual minority identity may provide individuals with a new set of social resources and reduce cognitive dissonance, a transitional period surrounding the time of identity change may serve as a time of psychological upheaval in addition to the psychological processes associated with identity change. For example, adopting a new identity may require leaving old

social groups that served as a source of community behind. Research has shown that sexual minorities who adopt a sexual minority identity are often met with rejection by family members and friends who do not approve of same-sex sexual orientations (D'augelli, Hershberger, Pilkington, 1998). Additionally, changing one's sexual orientation identity toward a more stigmatized sexual orientation identity in particular may expose individuals to new forms of discrimination that may result in poorer mental health.

Sexual Orientation Identity Development and Mental Health

While many studies have established that sexual orientation is multidimensional and fluid (Diamond 2008; Laumann et al. 1994; Mock and Eibach 2011; Ott et al. 2011; Rosario et al. 2011), very few studies have examined the relationship between sexual orientation identity change and/or consistency and mental health. Floyd and Stein (2002) examined sexual orientation development trajectories among a sample of 72 LGB youth and found that those who had earlier patterns of sexual minority development had higher levels of comfort with their sexual orientation compared to those who identified as a sexual minority at later ages (2002).

More recently, Rosario et al (2006, 2011) examined the relationship between stability and change in sexual orientation among a sample of 156 self-identified bisexual, gay, and lesbian young adults and psychological well-being, self-esteem, and positive identity integration. They found that respondents who reported a consistent gay identity were more likely to be involved in gay-related activities, have more positive attitudes about their sexual orientation, and were more likely to have shared their gay identity with people around them than bisexual youth and youth who changed their identity between the two time periods (2006). Moreover, they found that

youths who had recently transitioned to a gay identity had lower levels of certainty and acceptance of their gay identity (2006).

In a 2011 follow-up study using the same sample, Rosario et al. found that change in identity between the two time periods was not associated with differences in psychological distress. They had hypothesized that those who had recently changed their sexual orientation identity recently would have higher levels of distress due to the transition toward a stigmatized identity. However, they found that there were not differences in psychological distress.

The samples in the Floyd and Stein (2002) and Rosario (2006, 2008) studies, however, were not nationally representative and were limited to individuals who identify as bisexual, gay, or lesbian at the onset of data collection. Thus, these studies were unable to assess the relationship between identity change and mental health among initially heterosexual-identified persons, a population where the impact of identity-change may be most dramatic. And while the samples in these studies did not show differences in psychological well-being, the differences in identity integration, which are important for mental health, suggest that more investigation is needed regarding the relationship between identity development and mental health.

Explanatory Pathways

The extent to which individuals experience distress surrounding an identity change may be contingent on several factors. Additionally, to attribute increased psychological distress to the process of identity change, I must account for differences related to other forms of minority stress, such as familial relationships, contextual factors, victimization, and other measures of sexual orientation.

First, psychological distress associated with identity change may be partially explained by victimization. Other work has suggested that patterns of victimization may influence the timing of sexual minority identification (Rosario et al. 2006) as well as mental health outcomes (Herek, Capitanio, and Windaman 2002; Herek 1993, 2009; Huebner, Rebchook, and Kegeles 2004; Pilkington and D'Augelli 1995; Rostosky, et al. 2003; Russell, Seif, and Truong 2001; Savin-Williams 1994). Second, protective factors, such as family support, positive social relationships, and perceived social acceptance may facilitate earlier sexual minority identity development, and also improve mental health.

Third, shifts in identity may be more or less punitive for mental health depending on the extent to which individuals have integrated same-sex sexual orientation into their lives. For example, the effect of changing one's identity may be more stressful for individuals who have not had a same-sex sexual or romantic relationship. For example, the cognitive dissonance stemming from maintaining a 100% heterosexual identity while engaging in same-sex sex, may trigger identity control systems to realign themselves with a new identity in order to improve mental health. Indeed, some work has shown that the transition from heterosexual to a homosexual identity is done to eliminate dissonance between identity and behavior (Higgins 2002). Individuals who do not report same-sex attraction, behavior, or relationships may be earlier in the sexual identity development process and therefore have lower levels of self esteem, identity commitment, and/or positive feelings about their sexual minority identity (Rosario et al. 2006, 2011). The relevancy or commitment to an identity may determine the extent to which an identity change process produces psychological distress (Burke and Reitz 1991; Burk and Stets 1999; Stryker and Serpe 1982). If one has strong ties to a heterosexual identity and community, a change in identity or initiating a change in the identity may come at a greater cost.

Finally, the social environment may influence both the likelihood the timing and/or pattern of sexual orientation identity development, but also impact the mental health outcomes of sexual minorities. Indeed, Chapter 5 of this dissertation showed that certain characteristics of the social environment, such as percent Republican and percent same-sex couples, are associated with mental health outcomes among sexual minority populations. These factors may also influence the patterns of sexual minority development. For example, persons living in more conservative social environments may be less likely to identify with a sexual minority label due to increased fear of victimization and higher levels of stigma than persons who live in more liberal environments.

Aims

While much work has demonstrated that sexuality is fluid and that the process of identity development varies from individual to individual, much less work has examined the relationship between sexual orientation identity change and mental health. Using nationally representative, longitudinal data, this paper examines the relationship between changes in sexual orientation identity over two-time periods and depressive symptoms.

More specifically, I first investigate both whether the direction of the identity change (toward a more same-sex oriented identity or less same-sex oriented identity) and the magnitude of the identity change are associated with differences in depressive symptoms compared to respondents who report a stable sexual orientation identity over time.

Second, using propensity score matching, I focus exclusively on whether shifts toward more same-sex oriented identities are associated with depressive symptoms. This approach allows me to focus on the role of identity change specifically as I am able to balance, or ensure

that the "treated" group (those who changed identities) and the "control" group (those who did not) have similar distributions of all covariates included in the analysis.

Last, I investigate if the effect of identity change varies by the propensity to change sexual orientation identity. Persons with higher levels of propensity to change their identity may be further along in the process of developing a sexual minority identity than those with low propensities, and therefore the effect of that change may vary between these two groups. For example, identity change among respondents that have previously reported same-sex attraction, sex, or romantic relationships, or already identified with a non-100% heterosexual identity may be a final step in the identity integration process and improve mental health, whereas identity change among persons who have not previously reported any indicator of sexual minority status may be a more dramatic change and therefor be associated with higher levels of emotional distress.

Data.

This research uses data from the National Longitudinal Study of Adolescent Health (Add Health). The Add Health study began in the fall of 1994 and involves a nationally representative, longitudinal sample of U.S. adolescents. The initial Add Health sample was drawn from 80 high schools and 52 middle schools throughout the United States, with unequal probabilities of selection (Bearman, Jones, and Udry 1997; Harris et al. 2006). The first Wave of the Add Health study surveyed 90,118 adolescents who filled out a brief in-school survey. A subsample of students (n=20,747) and their parents were asked to fill out an additional in-depth home interview survey. High school seniors in Wave I of Add Health were not selected for follow-up for Wave II but were reclaimed for the Wave III sample. Response rates for this study were 79%

for Wave I, 88% for Wave II, and 77.4% for Wave III. Wave IV of the Add Health survey, collected between 2007 and 2008, located 92.5% of the original sample and interviewed 80.3% of the eligible respondents. Because high school seniors were not included in Wave II of Add Health, I limit my sample to Waves I, III, and IV. Ages range from 12 to 20 years old in Wave I, 18 to 26 in Wave III, and 25 to 33 in Wave IV.

Sample

The sample for this analysis excludes persons who did not report a sexual orientation identity at either Waves III or IV of the survey or they "don't know" what their orientation is. Individuals who reported that they were "not sexually attracted to either males or females" were also excluded from the sample, resulting in a total sample size of 12,081. Another 68 respondents were excluded because of missing information. For the portion of the analysis that focuses strictly on identity changes toward more same-sex oriented identities, the sample excludes persons who changed their identity toward less same-sex oriented identities, resulting in a sample size of 11,521.

Measures

Identity Change

The main independent variable of interest is change in sexual orientation identity between Waves III and IV of the Add Health survey. The Add Health survey asks respondents to identify their sexual orientation along a five point scale 100% heterosexual (straight) (1); mostly heterosexual (2); bisexual (3); mostly gay (4); or 100% gay (5). These questions were asked at both Waves III and IV of the survey.

A series of five dummy variables were created to examine the relationship between change in identity and mental health. Two variables were created that measure change in sexual orientation identities toward *more* same-sex oriented identities, one for individuals who changed only one-point in the orientation scale towards a more same-sex oriented identity (6.4%), and a second variable that measures whether individuals reported an identity at Wave IV that was two or more points higher in the sexual orientation identity scale (1.0%). Similarly, two variables were created that measure whether individuals reported a *less* same sex oriented identity at Wave IV than was reported at Wave III, one captures individuals who reported an identity one-point less same-sex oriented (4.0%), and the second captures whether individuals reported an identity two-points or more less same-sex oriented than their Wave III reported identity at Wave IV (0.4%). A final variable captures whether respondents report the same identity at Waves III and IV (referent) (88.3%).

In the propensity score matching portion of the analysis, I use a single dummy variable that measures whether respondents changed their identity toward a more same-sex oriented identity (7.7%) (treatment) or not (control).

Dependent Variables

The depressive symptoms scale is the abbreviated Center for Epidemiologic Studies Depression Scale (CES-D), ranges from 0 to 20 (Radloff, 1977), and has an alpha of .79. This item is derived from a series of five questions that ask respondents "how often was each of the following things true in the past seven days: you were bothered by things that don't usually bother you; you could not shake off the blues; you had trouble keeping your mind on what you were doing; you felt

depressed; you felt sad." Respondent answers for each question ranged from "0=never" to "4=very often."

Victimization

Several studies have shown that sexual minorities experience higher rates of victimization in both adolescence and young adulthood (Herek, Capitanio, and Windaman 2002; Herek 1993, 2009; Huebner, Rebchook, and Kegeles 2004; Pilkington and D'Augelli 1995; Rostosky, et al. 2003; Russell, Seif, and Truong 2001; Savin-Williams 1994), thus I control for several measure of victimization.

Childhood victimization is measured with three separate dummy variables that capture sexual abuse, physical abuse, and parental neglect. Childhood sexual abuse is derived from a question that asks respondents "by the time you were in 6th grade, how often had one of your parents of other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?" Respondents who report at least one incident are coded as yes (1) and those who report no incidences are coded as no (0, referent). Childhood physical abuse is derived from a question that asks respondents "By the time you started 6th grade, how often had your parents or other adult caregivers slapped, hit or kicked you?" Respondents who report at least one incident are coded as yes (1) and those who report no incidences are coded as no (0, referent). Childhood neglect is derived from a survey item that asks respondents "by the time you started 6th grade, how often had your parents or other adult care-givers left home alone when an adult should have been with you?" A dichotomous measure captures whether respondents report having been left alone by guardians 3 or more times (1) or less (0). Because of high levels of missing data for childhood abuse questions, for all three

measures, a missing variable is also included that captures if respondents refused or did not answer questions on sexual abuse, physical abuse, or neglect.

Forced sex is assessed with a dichotomous measure derived from two survey items in Wave IV that ask respondents if they have "ever been forced, in a non-physical way, to have any type of sexual activity against your will? For example, through verbal pressure, threats of harm or by being given alcohol or drugs" and "have you ever been physically forced to have any type of sexual activity against your will?" These two questions specifically exclude experiences with a parent or adult caregiver. Respondents who report either non-physical or physical sexual coercion are coded as yes (1) and those who do not are coded as no (0, referent).

Physical victimization in the previous 12 years is measured at Waves I, III, and IV of the survey. At all three waves physical victimization is coded as a binary variable that measures "which of the following things happened in the last month: someone pull a knife or gun on you; someone shot or stabbed you; someone slapped, hit, choked, or kicked you; you were beaten up?" Respondents who report at least one of these incidents coded as reporting being victimized in the last 12 months or not (referent).

Identity Integration

The extent to which changing one's sexual orientation may impact one's mental health may be in part related to the extent to which other aspects of a sexual orientation have been experienced by the individual, such as attraction, romantic relationships, and sexual relationships. Thus, I control

for sexual attraction at Waves I and III, romantic relationships at Wave I and III, and sexual relationships reported before the age of 18.[1]

Attraction is derived from two questions that ask respondents to identify whether they have ever been romantically attracted to a male and if they have ever been romantically attracted to a female. These questions were asked of both male and female respondents and are included in all three Waves of the Add Health data. From these two items, I am able to measure whether respondents report same-sex only attraction, both-sex attraction, or opposite-sex only attraction.

In Wave IV of the Add Health, survey respondents were asked, "Considering all types of sexual activity, with how many male partners have you ever had sex?" and "considering all types of sexual activity, with how many female partners have you ever had sex?" Respondents were also asked to identity the number of male and female partners they have ever had sex with before the age of 18. These questions were asked of both male and female respondents and allow me to measure whether respondents report having had same-sex only sexual encounters, both-sex sexual encounters, or opposite-sex only encounters.

Protective Factors

I also investigate the role of several protective factors that may both influence the timing and pattern of sexual orientation identity development as well as mental health. I control perceived social acceptance measured at Wave III, reported satisfaction with the relationship with respondent's parent(s), and perceived safety at school.

School attachment is a summed scale of responses to the following questions: "How much do you agree or disagree with the following statements: you feel close to people at your

[1] In order to have the correct temporal ordering, only sexual relationships reported before the age of 18 are included as controls.

school; you feel like you are a part of your school; you are happy to be at your school; the teachers at your school treat students fairly." Answers range from strongly agree (1) to strongly disagree (5). The scale ranges from 1 to 17 and has an alpha of .74.

Perceived social acceptance was derived from the question that asked respondents "how much do you agree or disagree with the following: you feel socially accepted." Responses to these questions range from strongly agree (1) to strongly disagree (5).

Teen satisfaction with their relationship with the parent is captured as a series of dummy variables derived from the question: "overall, you are satisfied with your relationship with [father/mother]." Respondents are coded as strongly disagreeing/disagree; neither agree nor disagree/agree; strongly agree (referent); or missing.

Contextual Factors

I control for several environmental factors that may influence sexual orientation development patterns as well as mental health outcomes, including percent Republican, percent poverty, percent college educated, and the percent same-sex couples.

Controls

I also control for sexual orientation identity reported at Wave III, depressive symptoms reported at Wave I, age, sex, race/ethnicity, and education level.

Analytic Plan

I use a four-step analytic plan to examine the relationship between identity change and mental health. First, I present descriptive statistics for the total population and by whether individuals

report the same sexual orientation identity between waves, shift toward a more same-sex oriented identity, or shift toward a less same-sex oriented identity. Bivariate tests were used to assess significant differences in means between stability in identity versus changes toward more same-sex oriented identities as well as differences in means between stability in identity and changes toward less same-sex oriented identities.

Second, I use multivariate negative binomial regression to examine the effect of identity changes on depressive symptoms. I test whether changes in identity toward more same-sex oriented identities differ from those persons who report a stable identity, whether changes in identity toward less same-sex oriented identities differ from those who report a stable identity, and whether the effect of sexual orientation identity changes vary by the magnitude of the change.

Third, I use propensity score matching to investigate the relationship between identity change toward a more same-sex oriented identity and depression. I use nearest neighbor matching, caliper matching with .10 standard deviation restrictions and subclassifcation matching. Conceptually, this approach capitalizes on the counterfactual framework (Rosenbaum and Rubin 1983, 1984; Rubin 1974, 1977) and allows me to examine the effect of a given "treatment" on a dependent outcome of interest by estimating a pseudo-randomized experimental trial. In a randomized experiment, treatment assignment is independent as illustrated in Equation 1, where W is treatment assignment and Y^1 is being assigned to the treatment group and Y^0 is being assigned to the control group:

$$W \perp Y^1, Y^0 \qquad (1)$$

Unfortunately, when using survey data, the treatment we are often interested in studying is not randomly distributed across the population, but rather treatment assignment is dependent upon one or more confounding variables as illustrated in Equation 2:

$$W \perp (Y^1, Y^0) | X \qquad (2)$$

Under the counterfactual framework, however, if *X* can be estimated such that each observation has some probability of being assigned to the treatment group (Y^1) that is greater than 0 and less than 1, regardless of whether that person is treated or not, than we have a Strongly Ignorable Treatment Assignment (SITA) as shown in Equation 3 and a theoretical basis for matching observations:

$$W \perp (Y^1, Y^0) | X \text{ and } 0 < P(W = 1|X) < 1 \qquad (3)$$

Thus, if we want treatment assignment, *W,* to be independent of *X* we must have a way of estimating the treatment assignment function *X* as in Equation 4:

$$W \perp X | b(X) \qquad (4)$$

This is done by creating a balancing score, or a propensity score, estimated from a logistic regression such that there are no systematic differences between the treatment group and control group as shown in Equation 5:

$$b(x) = logit\big(P(W = 1|X)\big) = \log \frac{P(W=1|X)-1)}{1-P(W=1|X)} = \alpha + \beta X \qquad (5)$$

Once propensity scores are calculated, I use three different matching techniques (nearest neighbor, caliper, and subclassifcation) to derive an Average Treatment Effect (ATE) of the treatment on the dependent variable of interest illustrated in Equation 6:

$$\text{ATE} = \sum(Y_{1j} - Y_{0j}) \qquad (6)$$

Where Y_1 and Y_0 are the potential outcomes in the two counterfactual situations, for example, reporting victimization versus not reporting victimization. I employ different matching

techniques to test if the ATE varies depending on the specificity of the match. Nearest neighbor without replacement matches treated respondents with a respondent in the control group whose propensity score is nearest to their own. All control units are dropped that are not matched to a treated respondent. Caliper matching is slightly more restrictive, as it specifies that treated respondents can only be matched to control-group respondents who fall within a .10 standard deviation of the treated respondent's propensity score. Similar to nearest neighbor matching, all unmatched control units are dropped.

Finally, I use subclassification matching, which calculates the ATE within propensity score block quartiles. While this approach is less restrictive, it has several advantages. First, because treated and control group respondents are matched within quartile blocks rather than respondent-to-respondent, fewer data are discarded. Second, it is easier to obtain balance using this more robust technique. Third, using subclassifcation matching, one can test whether the ATE is constant across propensity score blocks, or whether the ATE varies by the propensity to be treated. All propensity score analyses are conducted using the "MatchIt" (Ho et al. 2007) and "Zelig" (Kosuke, King, & Lau 2007) packages in R version 2.12.0.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics for all covariates used in the analysis for the total population and also by whether respondents remained stable in their sexual orientation between waves, changed toward a more same-sex oriented identity or changed toward a less same-sex oriented identity. Almost 12% of the total population reported different sexual orientation

identities between Waves III and IV, of which over 60% changed their sexual orientation to a more same-sex oriented identity.

Table 1 also presents the descriptive statistics stratified by stability or change in sexual orientation. The majority of respondents who changed their identity between waves did by only one-point in the identity scale: only 13.3% of those who shifted toward a more same-sex oriented identity changed by two or more points in the identity scale and only 9% of those who shifted toward a less same-sex oriented identity did so by two or more identities. The descriptive statistics also show difference in several important covariates by stability or change in identity.

Compared to males, females were significantly more likely to change identity between waves. This finding is in line with other work that has found that women have higher levels of sexual fluidity over the lifecourse compared to males (Ott et al. 2011; Rosario et al. 2011). Non-Hispanic whites were also more likely to report changes in identity than other race ethnic groups.

Respondents who reported an identity shift had significantly higher levels of depressive symptoms at both Waves I and III compared to those who reported a stable identity. Those who reported a shift toward a more same-sex oriented identity also reported higher levels of sexual abuse as children, and both groups that changed identity reported higher levels of being physically abused as children, sexual assault, and higher levels of perceived social unacceptability compared to those who report stable identities between waves.

Persons who changed their sexual orientation identity also report significantly higher levels of both-sex attraction at Wave III, more same-sex romantic relationships, and more same-sex sexual relationships before the age of 18. Respondents who shifted their identity toward less same-sex oriented identities also reported higher numbers of opposite sex romantic relationships.

Identity Change and Mental Health

Tables 2 presents the coefficients for change in sexual orientation identity regressed on depressive symptom. Model 1 controls for sociodemographic characteristics, Model 2 adds controls for victimization to Model 1, Model 3 adds controls for other measures of sexual orientation to Model 1, Model 4 adds controls for protective factors to Model 1, Model 5 adds measures of contextual factors to Model 1, and Model 6 controls for all of the covariates including in from Models 1 though 5. I use multivariate model building to assess the mediating effect of indicators of minority stress in Models 2 and 4, the effect of indicators of identity integration in Model 3, and the effect of the social environment in Model 5 on mental health outcomes. This technique allows me to assess which of these explanatory pathways may be most critical for reducing mental health disparities.

Depressive Symptoms

Model 1 of Table 1 shows that respondents who shifted toward a more same-sex oriented identity, both one-point up in the identity scale ($\beta = 0.19$, $p < .001$) and two or more points up in the scale ($\beta = 0.29$, $p < .001$) had higher levels of depressive symptoms compared to persons who report the same identity across both Waves. Change in identity toward a less same-sex oriented identity, however, was not associated with any increase in depressive symptoms. While bisexual-identified respondents in Model had higher levels of depressive symptoms than heterosexual respondents ($\beta = 0.23$, $p < .001$), respondents who reported a gay identity at both waves were not more likely to report higher levels of depressive symptoms than heterosexual-identified respondents who also reported a stable identity.

Adding controls for victimization only slightly attenuated the relationship between a one-point increase in the identity scale and depressive symptoms and did not affect the coefficient for reporting an identity two or more points higher in the identity scale. This trend held for Models 2 through 5, such that even when all controls were added in Model 6, identity shifts toward more same-sex oriented identities, either just one-point ($\beta = 0.20$, $p < .001$) or two points ($\beta = 0.35$, $p < .001$), were still significantly associated with increases in depressive symptoms compared to persons who report a stable identity. The inclusion of all controls in the Model 6, however, fully mediated the relationship between a bisexual identity and elevated depressive symptoms.

Stratified Results

The results presented in Table 1 show that, in line with other research, females have higher levels of sexual fluidity across the lifecourse (Diamond 2008; Dickson, Paul, and Herbison 2003; Mock and Eibach 2010; Ott et al. 2011). Thus, I completed a series of analysis that stratified the results by sex (see Appendix A). While females are indeed more likely to change sexual orientation identities, the supplementary results show that the effect of change does not statistically differ across the sexes. I also conducted a series of tests to examine whether the effect of identity change varied across age groups: respondents less than 29 years of age at Wave IV and respondents 29 years or older at Wave IV (See Appendix B). While the effect of identity change had a slightly larger impact on mental health outcomes among the younger age group, identity change toward more same-sex oriented identities were associated with increases in depression.

Identity Change Propensity Score Matching

The results presented in Tables 2 show that only changes toward more same-sex oriented identities are associated with poorer mental health outcomes. To be sure, changes in sexual identity toward less same-sex oriented identities did not differ from respondents who reported the same sexual orientation identity across both Waves of data. Thus, for this portion of the analysis, I focus exclusively on the effect of identity change on depressive symptoms using propensity score analyses.

I use multiple matching strategies for this portion of the analysis, with varying degrees of specificity for the matches. I first present the model with which the propensity score model was developed, followed by average treatment effects (ATEs) for the effect of identity change on all three dimensions of mental health using nearest neighbor, caliper, and subclassification matching strategies. For the caliper matching, I present results that restrict the quality of the matches to less than .10 standard deviations within the propensity score for the treated individuals. I match without replacement and specified that the order in which matches between the treatment to control units is random.

Table 5 shows the results from the logistic regression model used to estimate the propensity score. Heterosexual respondents were the most likely to report changing their sexual orientation identity between waves toward a more same-sex oriented identity. Respondents who reported being sexually (OR= 1.49, $p < .05$) and physically (OR = 1.36, $p < .05$) abused during childhood by their parent or guardian, as well as those who report being sexually assaulted by persons not their parent or guardian (OR =1.36, $p <.05$), were all more likely to report an identity shift between Waves III and IV. Respondents who report higher levels of perceived social unacceptance are also more likely to change their sexual orientation identity between Waves III and IV.

Unsurprisingly, respondents who report both-sex attraction at Wave III (OR = 2.80, $p < .001$) and have engaged in same-sex sexual relationship before the age of 18 (OR = 6.49, $p < .001$) were more likely shift identities between waves toward a more same-sex oriented identity. Romantic relationships, either same-sex or opposite sex, were not associated with changes in identity.

Several contextual factors are related to changes in identity toward more same-sex oriented: respondents who live in areas with higher proportions of persons with college degrees, and more same-sex couples were more likely to change identities between Waves III and IV, and respondents who live in neighborhoods with high concentrations of Republican voters were less likely to report changing their identity between waves.

Table 6 presents the ATEs for identity change on depressive symptoms. Identity shifts towards more same-sex oriented identities were associated with statistically significant increase in poorer mental health. The raw effect, which is merely the mean score of the treatment group minus the mean score of the control group, suggests that respondents who change their identity between waves are 1.14 points higher on the depressive symptoms scale than those who remain stable in their identity. Once the sample is matched based upon the propensity score, however, the effect ranged from 0.62 (95% CI = 0.37, 0.87) to 0.73 (95% CI = 0.55, 1.04) depending on the specificity of the matches. These results shows that even when balanced on all covariates, including those related to sexual orientation identity and other markers of sexual minority status, the changing one's sexual orientation identity toward a more same-sex oriented identity is associated with increases in depressive symptoms.

Effect of Identity Change by Propensity to Change

The effect of identity change may also be related to the propensity that individuals will report a change in their sexual orientation identity. For example, the results in Table 5 showed that individuals who report same-sex sex before 18 and both-sex attraction were more likely to report an identity shift between waves. It may be then that individuals who have experience with other indicators of sexual minority status may be further along in their sexual minority identity development than those who at Wave III have not had reported same-sex attraction, sex, or a romantic relationship.

Table 7 presents descriptive statistics for the sample by propensity blocks, where Block 1 represents the group of individuals with the lowest propensities to change their identity between Waves I and III and Block 4 is comprised of individuals with the highest propensities to change their identities between Waves. Bivariate tests were conducted to test whether the descriptive statistics in Blocks 2, 3, and 4 differ from those in Block 1. In Block 1, only 2.3% of the population changed their sexual orientation identity toward a more same-sex oriented identity between waves compared to 9.0% of Block 2, 23.4% of Block 3, and 43.9% of Block 4. Respondents in all other Blocks were more likely to report a sexual minority identity than those in Block 1. Respondents in Blocks 2-4 were also more likely to have higher rates of sexual minority indicators than those in Block 1. For example, only .8% of Block 1 reported having had same-sex sex before the age 18 compared to 67.6% of Block 4; 1.0% of Block 1 respondents reported both-sex attraction at Wave III compared to 63.9% of Block 4; and 1.0% of Block 1 respondents reported a same-sex romantic relationship at Wave III compared to 24.6% of Block 4.

Table 8 presents the coefficients for depressive symptoms derived from negative binomial regressions to account for overdispersion in the dependent variable, by propensity score

quartiles. The results show that the effect of identity change varied across subclassification Blocks. The magnitude of the coefficient for depressive symptoms became smaller in magnitude as the propensity for change increases across Blocks: Identity change was associated with a significant increase in depressive symptoms in Block 1 ($\beta = 0.29$, $p < .001$), Block 2 ($\beta = 0.25$, $p < .001$), less so in Block 3 ($\beta = 0.15$, $p < .001$), but not associated with depression in Block 4.

Discussion

The results presented here add to the literature on the relationship between sexual orientation and mental health by examining how differences in sexual orientation development, specifically identity change, are related to mental health disparities. These results are the first to examine the relationship between identity change and mental health using prospective, nationally representative data and show that identity shifts toward more same-sex oriented identities are associated with increases in depression, stress, and anxiety compared to persons who report stable sexual orientation identities over time. Moreover, once identity change, other indicators of minority stress, and sexual orientation are accounted for, the results show that there are no mental health differences by sexual orientation identity. These results suggest that the conflation of sexual minority identified persons who have recently changed identities with those who have maintained a stable sexual minority identity for longer periods of time may obscure important differences in mental health outcomes within the LGB population. Rather than LGB identified persons being pathologically and permanently depressed, these results suggest rather that mental health disparities may also be, in part, explained by a developmental risk period: It may be the process of change towards a stigmatized identity, rather than the identity itself that matters for mental health disparities by sexual orientation.

More recently, several scholars have argued that researchers should focus on healthy development among sexual minority populations, rather than continue to characterize LGB populations as being engendered to a life of poor mental health (Eccles, Sayegh, Fortenberry and Zimet 2004; Savin-Williams et al. 2011). Indeed, more recently some research has suggested that LGB populations are not at risk for poorer mental health outcomes compared to heterosexual persons (Savin-Williams 2005; Savin-Williams et al. 2010). This research highlights a specific mechanism through which mental health disparities are manifested as well as highlighting several important markers of minority stress, which fully mediate the relationship between a stable bisexual identity and mental health.

Identity Change and Mental Health

As reviewed in Chapter One, traditional models of sexual orientation identity development posit that sexual minority identities are developed through a series of phases that are associated with different mental health risks and outcomes (Cass 1979; Coleman 1982; Troiden 1989). In line with theories of identity development, these models characterize that the time surrounding identity changes as being particularly risky for sexual minorities as they struggle with developing a fully integrated sexual minority identity.

While largely criticized for characterizing sexual identity development as a linear progression from heterosexual to gay, and not acknowledging bisexuality as an end-stage, traditional theories suggest that the period of adjustment during which one experiences same-sex attraction and/or behaviors before adopting a sexual minority identity as a period of elevated psychological distress. The results presented in this chapter provide some support for these theories by showing that the process of identity *change*, rather than a sexual minority identity

itself, may be a previously underemphasized mechanism through which sexual minority health disparities are manifested.

Indeed, the results show that changes toward more same-sex oriented identities in young adulthood are associated with increases in depression, while changes in sexual orientation identities toward less same-sex oriented identities are not. The results also show that both more substantial changes in sexual orientation identity between waves and small changes in one's sexual orientation identity, such as 100% heterosexual to mostly heterosexual, are also associated with poorer mental health than respondents who remain stable in their sexual orientation identity between waves. This research is in line with other work that has suggested that stability in identity is related to higher levels of self-acceptance, identity integration, and self-esteem (Floyd and Stein 2002; Rosario et al. 2009, 2011). While the results presented here differ from the Rosario et al. (2011) study that found no difference in mental health by stability in sexual orientation, the Rosario sample included only 156 respondents and did not include heterosexual-identified persons in their initial sample.

This study also improves upon previous work by examining how identity-change may affect mental health depending upon whether the change is toward a more same-sex oriented identity or a less same-sex oriented identity. The results show that shifts towards more stigmatized identities were associated with poorer mental health, while those toward less stigmatized identities were not. This may be due to several different factors. First, adopting a stigmatized identity may expose respondents to new sources of discrimination, both structural and interpersonal that they may have not previously experienced. Exposure to new sources of discrimination, coupled with a lack coping skills for managing discrimination, may be a source of stress that those who change toward a more stigmatized identity are exposed to that is not

experienced by respondents that report a less stigmatized identity. Indeed, other work has suggested that the impact of discrimination on mental health is larger among persons who are the least likely to experience discrimination (Everett and Saint Onge 2010). Identity change toward a more stigmatized identity may also mean seeking new social networks and resources that may be harder to gain access to than persons who change their identity to a heterosexual identity.

Propensity to Change and Mental Health

This study also examined how the effect of identity change varies by the propensity to change one's identity toward a more same-sex oriented identity. Identity control theory suggests that individuals change their identity when the identity standard and the evaluation of their performance of the identity standard are misaligned and the realignment of identity and behavior (for example) will reduce cognitive dissonance and improve well-being (Burke 2006). Thus, I investigated whether the affect of identity change varied by the likelihood of changing by stratifying by propensity blocks. The results reveal first, that those individuals who are the most likely to change their sexual orientation identity are also significantly more likely to have higher rates of same-sex sex, same-sex attraction, and same-sex relationships. Second, a clear gradient emerges for depressive symptoms: as the probability of identity change increases, the effect of identity change on depression decreases. This finding suggests that the relationship between identity change and mental health may be contingent on other measures of sexual orientation identity integration. That is, among respondents who have already engaged in same-sex sex, relationships, or reported same-sex attraction, an identity shift does not perturb mental health, and while not demonstrated here, may improve health in the future. Those who change identities

between the two time-periods without other markers of sexual minority status may have lower levels of identity integration and therefore a bigger psychosocial adjustment to make.

This paper suffers from several limitations. First, I am unable to examine changes in identity before Wave III. Respondents who identify with a sexual minority label may have done so at differing ages. However, respondents who identify with a sexual minority identity early in life may do so in part because they may live in more supportive and/or accepting households. Many sexual minorities may delay identification until later in life or until they have moved out of their parents' or guardians' households to avoid confrontation or banned from the home (D'augelli, Hershberger, and Pilikington 1998). Thus the relationship between identity changes before Wave III, which is around the time when respondents typically would have moved into their own residences, and mental health may be related to the home setting or the social environment rather than the process of identity change itself.

Unfortunately, I am unable to assess other aspects of sexual minority identity integration, such as participation in LGB social activities, clubs, politics, nor the degree to which individuals feel comfortable with their same-sex sexuality and disclosing their identity to those around them (Morris 1997; Rosario et al. 2001, 2006). Indeed, while other work has not demonstrated that differences in earlier versus later identity development did not reveal differences in mental health outcomes; Rosario et al. (2011) found that differences in identity integration were related to differences in mental health outcomes.

Despite these limitations, this study provides new insights into the understanding of mental health disparities by sexual orientation. To date, most studies have argued that minority stress is the primary pathway through which mental health disparities are manifested, and while measures of victimization are indeed critical for reducing psychological distress among this

population, the intense focus on minority stress has come at the exclusion of other potential psychosocial mechanisms. Moreover, the continued focus on the negative aspects of sexual minorities' mental health has distracted from examining healthy development. By taking a developmental approach, the results here show that rather than a gay or bisexual identity being a marker of poor mental health, it may be that the *process* of adopting a sexual minority identity, in addition to sources of minority stress, that will help us to further understand sexual minority mental health.

Table 1. Descriptive statistics for the total population and by identity development

	Total Sample	Stable Identity	Identity Change: More Same-Sex Oriented		Identity Change: Less Same-Sex Oriented	
	N=12,013	N=10,602	N=919		N=492	
Stable Identity	88.25	---	---		---	
Identity Change						
One-Point more same-sex	6.39	---	86.72		---	
Two-Point more same-sex	0.98	---	13.28		---	
One-Point less same-sex	3.99	---	---		91.15	
Two-Point less same-sex	0.39	---	---		8.85	
Sexual orientation identity						
100% Heterosexual	89.86	94.70	85.46	***	0.01	***
Bisexual/Mostly Heterosexual	8.70	4.41	10.55	***	91.89	***
100% Gay/Mostly Gay	1.44	0.89	3.99	***	8.10	***
Depressive Symptoms, WI	6.42	6.27	7.42	***	7.77	***
Sociodemographic Characteristics						
Age	28.76	28.79	28.28		28.77	
Female	50.74	47.46	79.10		70.42	
Male	49.26	52.54	20.90		29.58	
Race/Ethnicity						
Non-Hispanic white	68.75	67.89	74.27	**	77.86	***
Non-Hispanic black	14.53	15.22	10.65	**	7.21	***
Hispanic	11.33	11.50	10.60		9.56	
Asian	3.51	3.63	2.36	*	3.38	
Other race/ethnicity	1.88	1.76	2.12		1.99	
Education						
Less than high school	8.09	8.03	8.38		9.14	
High school graduate	16.68	17.10	11.97	***	15.16	
Vocational training	9.53	9.32	11.90	†	10.24	
Some college	43.12	42.84	47.77		41.98	
College graduate	22.58	22.71	19.98		23.48	
Victimization						
Victimized, WI	36.60	36.90	32.73	*	37.15	
Victimized, WIII	10.18	10.34	7.64	**	11.60	
Missing, WIII	0.97	0.87	1.34		2.24	
Sexual Abuse, Childhood	4.45	4.12	7.75	**	5.91	
Missing	3.26	3.21	2.69		5.32	
Physical Abuse, Childhood	27.45	26.64	33.81	**	33.69	*
Missing	4.31	4.34	3.40		5.47	
Neglect, Childhood	38.49	38.28	38.22		43.50	
Missing	6.33	6.37	5.83		6.52	
Rape	14.32	12.57	28.63	***	25.54	***
Sexual Minority Indicators						
Sexual Attraction						
Same-sex only, WI	0.95	0.89	1.67		0.98	
Both-sex, WI	5.10	4.61	6.43		11.80	***
Other-sex, WI	93.95	94.50	91.90		87.22	

Table 1. Continued

Same-sex only, WIII	0.74	0.54	1.12		4.06	*
Both-sex, WIII	8.63	5.32	19.08	***	57.74	***
Other-sex, WIII	90.63	94.14	79.80		38.20	
Same-sex sex before 18	3.34	1.96	14.94	***	11.68	***
Romantic Relationship						
Same-sex, WI	1.38	1.31	2.00		1.84	
Opposite-sex, WI	62.53	62.03	62.89		71.21	*
Same-sex, WIII	2.87	2.02	7.29	***	12.51	***
Opposite-sex, WIII	83.82	83.76	85.12		83.24	
Protective Factors						
Perceived social unacceptability	13.49	13.41	13.95	**	14.39	***
Perceived social unacceptability	7.14	7.08	7.59	***	7.77	***
Satisfied with Relationship with parent						
Strongly disagree	5.48	5.24	6.48		8.93	*
Neither agree nor disagree	44.20	43.64	46.62		50.79	
Strongly Agree	47.45	48.61	45.86		38.36	
Missing	2.87	2.51	1.04	**	1.92	
You feel safe at school						
Strongly disagree	24.65	24.79	26.47		22.51	
Neither agree nor disagree	61.75	62.01	59.42		60.54	
Strongly agree	11.71	11.40	13.07		15.77	
Missing	1.89	1.80	1.04	†	1.18	
Contextual Measures						
Percent republican						
≤ 33%	13.69	13.73	14.82		11.38	
> 33% to ≤ 66%	66.65	66.27	69.27	*	69.81	
> 66%	19.66	20.00	15.91		18.81	
Percent poverty	0.86	0.87	0.79		0.72	+
Percent college degree	0.65	0.64	0.75		0.77	+
Same-sex couples						
Same-sex couples, 0.0%	54.32	54.52	52.10		54.34	
Same sex couples, 1.0%	36.90	36.95	35.87		37.51	
Same sex couples, 2.0% to 8.0%	8.78	8.53	12.03	+	8.15	
Depressive symptoms	2.58	2.47	3.55	***	3.02	**

Source: Waves I, III, and IV of the National Longitudinal Study of Adolescent Health

† p ≤ .10. * p ≤ .05 ** p ≤ .01 *** p ≤ .001

Note: Referent group for significance tests is "stable identity."

Table 2. Betas for differences in depressive symptoms at Wave IV by sexual identity development

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	β	β	β	β	β	β
Identity Change (Stable)						
One-Point more same-sex	0.26 ***	0.22 ***	0.25 ***	0.23 ***	0.26 ***	0.20 ***
Two-Point more same-sex	0.36 ***	0.35 ***	0.35 ***	0.36 ***	0.36 ***	0.35 ***
One-Point less same-sex	-0.09	-0.07	-0.08	-0.08	-0.09	-0.05
Two-Point less same-sex	0.03	-0.07	0.03	0.04	0.03	-0.05
Sexual orientation identity (Heterosexual)						
100% Gay/Mostly gay	0.04	0.03	-0.13	0.01	0.04	-0.10
Bisexual	0.23 ***	0.18 ***	0.16 **	0.18 ***	0.23 ***	0.09
Depressive Symptoms, WI	0.05 ***	0.04 ***	0.04 ***	0.04 ***	0.05 ***	0.03
Age	-0.01	-0.01	-0.01	-0.01	-0.01	0.00
Female	0.11 ***	0.10 ***	0.12 ***	0.11 ***	0.11 ***	0.10
Race/ethnicity (Non-Hispanic white)						
Non-Hispanic black	0.21 ***	0.20 ***	0.21 ***	0.24 ***	0.23 ***	0.24 ***
Hispanic	0.01	0.01	0.01	0.03	0.02	0.03
Asian	0.07	0.06	0.06	0.05	0.07	0.05
Other race/ethnicity	0.05	0.04	0.04	0.05	0.06	0.04
Education (College graduate)						
Less than high school	0.49 ***	0.45 ***	0.48 ***	0.46 ***	0.50 ***	0.44 ***
High school graduate	0.30 ***	0.27 ***	0.29 ***	0.28 ***	0.30 ***	0.26 ***
Vocational training	0.15 **	0.15 ***	0.14 **	0.15 ***	0.32 ***	0.16 ***
Some college	0.17 ***	0.13 ***	0.16 ***	0.14 ***	0.17 ***	0.11 ***
Victimization Measures						
Victimized, WI		0.04				0.04
Victimized, WIII		0.09 *				0.08 *
Missing, WIII		0.00				0.01
Sexual Abuse, Childhood		0.05				0.05
Missing		0.03				0.03
Physical Abuse, Childhood		0.09 ***				0.06
Missing		-0.07				-0.07
Neglect, Childhood		0.09 **				0.08 **
Missing		0.08 +				0.08 +
Rape		0.25 ***				0.23 ***

Table 2. Continued

Sexual Orientation Indicators						
Sexual Attraction						
Same-sex only, WI			0.08			0.06
Both-sex, WI			0.11 *			0.11 **
Same-sex only, WIII			0.29 *			0.23 +
Both-sex, WIII			0.09 +			0.06
Same-sex sex before 18			0.03			0.02
Romantic Relationship						
Same-sex, WI			0.03			-0.03
Opposite-sex, WI			-0.01			-0.01
Same-sex, WIII			-0.11			-0.14
Opposite-sex, WIII			-0.04			-0.05
Protective Factors						
Perceived social unacceptability, WI				0.02		0.00
Perceived social unacceptability, WIII				0.06 ***		0.05 ***
Satisfied with Relationship with parent (Strongly agree)						
Strongly disagree				0.04		0.01
Neither agree nor disagree				-0.01		-0.02
Missing				0.00		-0.03
You feel safe at school (Strongly disagree)						
Neither agree nor disagree				0.08 †		0.07
Strongly agree				0.03		0.02
Missing				-0.03		-0.06
Contextual Factors						
Percent Republican (≤ 33%)						
> 33% to ≤ 66%					-0.01	-0.01
> 66%					0.00	0.00
Percent poverty					-0.02	-0.01
Percent college degree					0.00	0.00
Percent same-sex couples (0.0%)						
Same sex couples, 1.0%					-0.02	-0.02
Same sex couples, 2.0% to 8.0%					0.00	0.01
Constant	0.56 ***	0.40 †	0.60 **	0.09 **	0.58 **	0.03
Lnalpha	-0.82	-0.86	-0.83	-0.87	-0.82	-0.91
alpha	0.44	0.42	0.44	0.42	0.44	0.40

Source: Waves I, III, and IV of the National Longitudinal Study of Adolescent Health

† p ≤ .10. * p ≤ .05 ** p ≤ .01 *** p ≤ .001

Note: Referent in parentheses

Table 3. Odds ratios for covariates predicting identity change

	OR	
Sexual orientation identity (Heterosexual)		
100% Gay/Mostly gay	1.12	
Bisexual	0.45	**
Depressive Symptoms, WI	1.01	
Age	0.86	***
Female	3.75	***
Race/ethnicity (Non-Hispanic white)		
Non-Hispanic black	2.16	
Hispanic	2.7	
Asian	1.99	
Other race/ethnicity	2.75	†
Education (College graduate)		
Less than high school	1.15	
High school graduate	0.84	
Vocational training	1.35	*
Some college	1.09	
Victimization Measures		
Victimized, WI	1.11	
Victimized, WIII	0.91	
Missing, WIII	1.35	
Sexual Abuse, Childhood	1.49	*
Missing	0.88	
Physical Abuse, Childhood	1.36	*
Missing	1.04	
Neglect, Childhood	0.84	+
Missing	1.01	
Rape	1.36	*

Table 3. Continued

Sexual Orientation Indicators		
Sexual Attraction		
Same-sex only, WI	0.93	
Both-sex, WI	1.25	
Same-sex only, WIII	0.97	
Both-sex, WIII	2.8	***
Same-sex sex before 18	6.49	***
Romantic Relationship		
Same-sex, WI	0.57	
Opposite-sex, WI	1.08	
Same-sex, WIII	1.15	
Opposite-sex, WIII	1.02	
Protective Factors		
Perceived social unacceptability, WI	0.99	
Perceived social unacceptability, WIII	1.05	*
Satisfied with Relationship with parent (Strongly agree)		
Strongly disagree	0.79	
Neither agree nor disagree	1.07	
Missing	0.43	†
You feel safe at school (Strongly disagree)		
Neither agree nor disagree	1.04	
Strongly agree	0.91	
Missing	1.79	
Contextual Factors		
Percent Republican (≤ 33%)		
> 33% to ≤ 66%	0.93	
> 66%	0.66	*
Percent poverty	0.97	
Percent college degree	1.19	*
Percent same-sex couples (0.0%)		
Same sex couples, 1.0%	1.02	
Same sex couples, 2.0% to 8.0%	1.54	*
Constant	0.36	

Study of Adolescent Health

† p ≤ .10. * p ≤ .05 ** p ≤ .01 *** p ≤ .001

Note: Referent in parentheses

Table 4. Average treatment effects (ATEs) for identity change on depressive symptoms

	Depression		
	ATE	95 % CI	
Raw Effect	1.14		
Nearest neighbor random	0.65	0.41	0.89
Nearest neighbor, caliper (.10)	0.62	0.37	0.87
Subclassification	0.73	0.55	1.04

Source: Waves I, III, and IV of the National Longitudinal Study of Adolescent Health

† $p \leq .10$. * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Subclassification N=11,521

ATE: Average Treatment Effect; 95% CI=95% Confidence Interval

Table 5. Descriptive statistics by propensity score blocks

	Block 1 N=5,606	Block 2 N=4,772		Block 3 N=852		Block 4 N=269	
Identity Change	2.33	9.01	***	23.36	***	42.85	***
Sexual orientation identity (Heterosexual)							
100% Gay/Mostly gay	0.34	0.89	*	2.23	**	16.06	***
Bisexual	2.03	5.45	***	13.00	***	26.25	***
Depressive symptoms, WI	5.53	6.76	***	8.66	***	9.00	***
Age	29.12	28.55	***	27.72	***	27.88	***
Female	10.10	88.11	***	93.45	***	92.12	***
Male							
Race/Ethnicity							
Non-Hispanic white	64.30	70.72	***	83.19	***	76.61	**
Non-Hispanic black	17.37	14.08	*	5.30	***	8.08	***
Hispanic	12.08	11.24		7.70	*	11.34	
Asian	4.52	2.88	**	1.16	***	1.61	+
Other race/ethnicity	1.89	1.33		3.41	+	2.36	
Education							
Less than high school	8.37	7.19	+	10.13		7.67	
High school graduate	22.42	11.87	***	5.76	***	8.08	*
Vocational training	7.95	9.70	*	16.26	***	15.99	**
Some college	31.75	35.01	*	37.84	*	37.98	
College graduate							
Victimization							
Victimized, WI	44.18	27.96	***	32.44	***	36.28	*
Victimized, WIII	14.10	5.76	***	7.11	***	9.67	+
Missing, WIII	0.82	0.81		1.24		3.32	
Sexual Abuse, Childhood	2.35	4.83	***	11.57	***	14.85	***
Missing	4.13	2.23	***	1.56	***	3.69	
Physical Abuse, Childhood	23.58	26.63	**	47.14	***	43.70	***
Missing	5.52	3.18	***	2.30	***	2.96	
Neglect, Childhood	39.62	36.99	***	38.74		44.81	
Missing	7.58	5.02	***	5.48	+	4.81	
Rape	4.03	16.93	***	45.53	***	55.36	***
Sexual Minority Indicators							
Sexual Attraction							
Same-sex only, WI	0.58	1.08	*	2.09	*	2.44	+
Both-sex, WI	4.88	3.88	+	6.08	*	12.30	**
Other-sex, WI							
Same-sex only, WIII	0.38	0.49		1.54	+	3.02	*
Both-sex, WIII	1.01	6.40	***	21.33	***	63.85	***
Other-sex, WIII							
Same-sex sex before 18	0.84	1.22	***	8.94	***	67.57	***

Table 5. Continued

Romantic Relationship							
Same-sex, WI	1.17	1.32		1.96		3.91	+
Opposite-sex, WI	62.36	61.84		59.68		70.61	*
Same-sex, WIII	1.03	1.95	**	6.41	***	24.63	***
Opposite-sex, WIII	81.79	85.91	***	86.96	**	82.72	
Protective Factors							
Perceived social unacceptability, WI	13.02	13.72	***	14.37	***	14.71	***
Perceived social unacceptability, WIII	6.78	7.22	***	8.26	***	8.25	***
Satisfied with Relationship with parent							
Strongly disagree	3.71	6.98	***	5.80	+	10.06	*
Neither agree nor disagree	43.03	43.07		52.20	***	49.53	+
Strongly Agree							
Missing	3.88	0.62	***	0.75	***	1.15	
You feel safe at school							
Strongly disagree							
Neither agree nor disagree	10.40	12.29	+	12.20		18.00	*
Strongly agree	62.91	61.51		59.40		53.04	*
Missing		1.62		4.47	***	7.26	*
Contextual Measures							
Percent republican							
≤ 33%							
> 33% to ≤ 66%	65.08	66.80		72.30	*	71.94	+
> 66%	21.96	19.10	*	11.20	***	11.70	***
Percent poverty	93.41	0.82	***	61.19	***	0.97	
Percent college degree	57.70	0.68	***	91.02	***	0.80	**
Same-sex couples, 0.0%	55.61	54.08		49.62	**	48.27	**
Same sex couples, 1.0%	37.05	37.36		34.41		33.10	
Same sex couples, 2.0% to 8.0%	7.34	8.56		15.97	***	18.63	***
Depressive symptoms	2.26	2.63	***	4.60	***	3.91	***

Source: Waves I, III, and IV of the National Longitudinal Study of Adolescent Health

† p ≤ .10. * p ≤ .05 ** p ≤ .01 *** p ≤ .001

Note: Referent in parentheses

Table 6. Betas for the affect of identity change on depressive symptoms

	Class 1	Class 2	Class 3	Class 4
Depression	0.29 ***	0.25 ***	0.15 *	0.09

Source: Waves I, III, and IV of the National Longitudinal Study of Adolescent Health

† p ≤ .10. * p ≤ .05 ** p ≤ .01 *** p ≤ .001

Appendix A. Betas for differences in depressive symptoms at Wave IV stratified by sex and age

	Depression				Depression			
	Females		Males		< 29 Years		≥ 29 Years	
	β		β		β		β	
Identity Change (Stable)								
One-Point more same-sex	0.20	***	0.24	**	0.19	***	0.14	**
Two-Point more same-sex	0.34	***	0.28		0.35	***	0.32	+
One-Point less same-sex	-0.09		0.02		-0.05		0.04	
Two-Point less same-sex	-0.04		-0.22		-0.05		-0.22	*
Sexual orientation identity (Heterosexual)								
100% Gay/Mostly gay	0.11		-0.44	*	-0.1		-0.07	
Bisexual	0.13	*	0.03		0.09		-0.09	
Depressive Symptoms, WI	0.03	***	0.04		0.03	***	0.04	**
Age	0.00		0.00		0		0.01	
Female	---		---		0.1	***	0.1	**
Race/ethnicity (Non-Hispanic white)								
Non-Hispanic black	0.17	***	0.30	***	0.24	***	0.21	***
Hispanic	0.04		0.04		0.03		0	
Asian	0.07		0.03		0.05		-0.01	
Other race/ethnicity	-0.01		0.12		0.04		0.14	
Education (College graduate)								
Less than high school	0.49	***	0.40	***	0.44	***	0.48	***
High school graduate	0.30	***	0.23	***	0.26	***	0.21	***
Vocational training	0.17	**	0.13	*	0.16	***	0.12	+
Some college	0.11	***	0.12	*	0.11	***	0.12	**
Victimization Measures								
Victimized, WI	0.06		0.00		0.04		0.06	
Victimized, WIII	0.14	*	0.04		0.08	*	0.03	
Missing, WIII	0.08		-0.05		0.01		0.24	*
Sexual Abuse, Childhood	0.05		0.02		0.05		0.05	
Missing	0.00		0.03		0.03		0.03	
Physical Abuse, Childhood	0.06	†	0.06		0.06	*	0.01	
Missing	-0.09		-0.05		-0.07		-0.1	
Neglect, Childhood	0.03		0.13	***	0.08	**	1.11	**
Missing	0.07		0.10		0.08	+	0.12	+
Rape	0.22	***	0.34	***	0.23	***	0.25	***

Appendix A. Continued

Sexual Orientation Indicators								
Sexual Attraction								
Same-sex only, WI	0.05		0.11		0.06		-0.05	
Both-sex, WI	0.04		0.17	**	0.11	**	0.12	*
Same-sex only, WIII	0.14		0.49	*	0.23	+	0.27	+
Both-sex, WIII	0.06		0.14		0.06		0.11	
Same-sex sex before 18	0.02		-0.02		0.02		0.06	
Romantic Relationship								
Same-sex, WI	0.00		-0.08		-0.03		-0.04	
Opposite-sex, WI	-0.04		0.02		-0.01		0	
Same-sex, WIII	-0.18	†	-0.05		-0.14	+	-0.18	
Opposite-sex, WIII	-0.16	***	0.05		-0.05		-0.11	
Protective Factors								
Perceived social unacceptability, WI	0.03		0.01		0		0	
Perceived social unacceptability, WIII	0.07	***	0.05	***	0.05	***	0.05	***
Satisfied with Relationship with parent (Strongly agree)								
Strongly disagree	0.03		0.08		0.01		0.03	
Neither agree nor disagree	0.05	+	-0.09	*	-0.02		-0.02	
Missing	0.06		-0.08		-0.03		0	
You feel safe at school (Strongly disagree)								
Neither agree nor disagree	0.06		0.07		0.07		0.12	+
Strongly agree	0.03	+	-0.01		0.02		0.05	
Missing	-0.12		-0.01		-0.06		-0.09	
Contextual Factors								
Percent Republican (≤ 33%)								
> 33% to ≤ 66%	-0.02		0.01		-0.01		-0.03	
> 66%	0.01		-0.01		0.01		0.02	
Percent poverty	0.02		-0.04	*	-0.01		-0.03	
Percent college degree	0.01		-0.02		0		-0.01	
Percent same-sex couples (0.0%)								
Same sex couples, 1.0%	0.01		-0.05		-0.02		-0.01	
Same sex couples, 2.0% to 8.0%	-0.01		0.02		0.01		-0.02	
Constant	0.34		-0.20		0.03		-0.2	
Lnalpha	-0.97		-0.91		-0.91		-0.88	
alpha	0.38		0.40		0.4		0.42	

Source: Waves I, III, and IV of the National Longitudinal Study of Adolescent Health

† p ≤ .10. * p ≤ .05 ** p ≤ .01 *** p ≤ .001