Resilience Among Sexual Minority Youth: The Role of Natural Mentors in Improving Mental Health and Substance Abuse Outcomes

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BOSTON COLLEGE
Graduate School of Social Work

RESILIENCE AMONG SEXUAL MINORITY YOUTH:

THE ROLE OF NATURAL MENTORS IN IMPROVING MENTAL HEALTH

AND SUBSTANCE ABUSE OUTCOMES

A dissertation
by

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Abstract

A growing body of evidence shows that sexual minority youth disproportionately suffer from poor mental health and substance abuse outcomes in comparison to their heterosexual peers. Parental support has been found to be a strong protective factor for these youth. There is a lack of research, however, that examines the role of *non-parental* adult support, such as natural mentors (e.g., teachers, grandparents, and coaches). Guided by minority stress and resiliency theories, the current study aims to deepen our understanding of whether natural mentors act as a resilience resource for sexual minority youth.

The current study uses the National Longitudinal Study of Adolescent to Adult Health (Add Health) restricted-use dataset. This is a large, nationally representative sample of both heterosexual (n=12,667) and sexual minority youth (n=1,413), ages 18 to 26. Variable-centered (i.e., multiple regression analysis with moderation) and person-centered (latent class analysis) statistical techniques were utilized to explore the effect of the presence and characteristics of natural mentoring relationships on a range of mental

health and substance abuse outcomes.

Results show that natural mentors have a similar relationship with health outcomes, regardless of sexual orientation. Perceived closeness is a critical characteristic of the mentoring relationship, exhibiting significant associations with depression, suicide ideation, self-esteem, life satisfaction, and binge drinking. Furthermore, those who have lifelong, close relationships with non-parental adult family members receive the most benefit. It is noteworthy that sexual minority youth are significantly less likely to have a permanent family mentor. Rather, they are more likely to have mentors from high school with whom they lack closeness as they transition into adulthood.

Several suggestions for individual and school-based interventions to assist sexual minority youth in developing and maintaining long-term relationships with non-parental adult family members are discussed. The current study emphasizes the importance of supporting and advocating for greater policy change that will directly address minority stressors that sexual minority youth face. Findings from the current study make a significant contribution to the social work field by extending our knowledge regarding resiliency among sexual minority youth and offering concrete avenues for intervention.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I. PURPOSE AND SIGNIFICANCE

Purpose

The current study seeks to expand our understanding of the role of natural

mentors in improving mental health and substance abuse outcomes for sexual minority

youth.[1] Currently, there is no solid estimate of the number of sexual minority youth in the

United States. This is because of a lack of large scale, population-based surveys that

include a question regarding sexual orientation, and inconsistences in the measurement of

sexual orientation. For example, rates are higher among females than males, highest

when romantic attraction is measured (compared to identity or behavior), and highest

when "mostly heterosexual" is included with identity (Savin-Williams & Ream, 2006).

Given this, the prevalence rates of sexual minority youth in the United States vary

between 1% and 15%, depending on the sexual orientation dimension measured (i.e.

attraction, behavior, or identity), and whether mostly heterosexual and bisexual youth are

included (Savin-Williams & Ream, 2006). This represents about 650,000 to 8 million

youth, ages 10-24 (U.S. Census Bureau, 2013 American Community Survey). Stronger

estimates among the adult population exist: 3.5% identify as LGB, 8.2% engage in same-

sex behavior, and 11% acknowledge a same-sex attraction (Gates, 2011).

Regardless of the exact number of sexual minority youth in the U.S., empirical

evidence is mounting regarding health disparities for these youth. A *health disparity* is

defined as: "a particular type of health difference that is closely linked with social,

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[1] Sexual minority, like lesbian, gay, and bisexual (LGB), is a term often found in the literature. It is defined as those who identify as gay or lesbian, bisexual, or unsure of their sexual identity, *or* youth who have had sexual contact or attraction with persons of the same sex or with both sexes (Center for Disease Control and Prevention, 2011). The current study mostly uses the term sexual minority youth unless a different term is used in the literature being reviewed. Additionally, the current study was not able to include transgender individuals in the sample, so will therefore only refer to these individuals when represented in another study's sample.

economic, and/or environmental disadvantage" (Healthy People 2020, para. 5).

Numerous studies have found that sexual minority youth have higher rates of depression, suicide ideation and attempts, and substance use and abuse (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009; Coker, Austin, & Schuster, 2010; Corliss et al., 2013; Haas et al., 2010; Johns, Zimmerman, & Bauermeister, 2012; Marshal et al., 2008; Mustanski, Van Wagenen, Birkett, Eyster, & Corliss, 2014b; Needham, 2011). These findings have been consistent across studies using various sampling methods, dimensions of sexual orientation, regions and countries, as well as across time (Saewyc, 2011).

Some recent studies have focused on adult social support as a resiliency factor for sexual minority youth, particularly from parents. These studies have found that parents act as an important protective factor for LGB youth against poor mental and behavioral health outcomes (Bouris et al., 2010; Eisenberg & Resnick, 2006; Needham & Austin, 2010; Ryan, Russell, Huebner, Diaz, & Sanchez, 2010). LGB resiliency research has primarily focused on adult social support from parents, rarely delving deeper into a youth's adult support network to study additional protective factors. The current study aims to fill this gap in the literature by examining the impact of natural mentors, which represent another form of adult social support in sexual minority youths' lives that may buffer against poor mental health and substance abuse outcomes.

Natural mentors are non-parental adults, such as extended family members, teachers, or neighbors, with whom a youth has an informal relationship in which they receive support and guidance (Zimmerman, Bingenheimer, & Behrendt, 2005). A natural mentor is often thought of as someone within the youth's support network who shapes adolescent development by serving in a similar functional role as a parent, sometimes

compensating for inept or absent parenting (Darling, Hamilton, & Shaver, 2003).

Mentoring relationships are further defined by the fact that they are sustained over a

significant period of time, with regular contact between the mentor and youth (DuBois &

Karcher, 2014). Natural mentors are distinct from formal mentors, who are non-parental

adults paired with youth through a formal mentoring program such as Big Brothers, Big

Sisters. Given that natural mentors are those whom a youth is already familiar, these

relationships can be less threatening and often last longer than formal mentoring

relationships (Hurd, Stoddard, Bauermeister, & Zimmerman, 2014).

A large percentage of youth – 73% of 18-26 year olds – identify at least one

natural mentor who has had a critical impact on their lives since they were 14 years old

(DuBois & Silverthorn, 2005b). Several studies show a positive impact of mentors for a

range of outcomes, including academic engagement and achievement; reduced problem

behaviors such as substance abuse and gang involvement; increased psychological

wellbeing; improvements in parental relationships; and enhanced self-esteem (for review

see DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011). Furthermore, research has

found that mentors are especially beneficial for youth who face environmental risks

(DuBois, Holloway, Valentine, & Cooper, 2002). For example, in a meta-analysis of

mentoring programs, effect sizes were significantly higher for programs serving youth

experiencing environmental risk, such as low socioeconomic status (DuBois et al., 2002).

Interestingly, DuBois & Silverthorn (2005) examined the impact of natural mentors for

youth with several environmental and individual risks and found inconsistent benefits for

a variety of educational, physical and mental health outcomes.

We know little about the influence of natural mentors for sexual minority youth. Given that sexual minority youth often face increased risks of parental, peer, and societal rejection, natural mentors may act as a salient protective factor against poor mental health and substance abuse outcomes. There are currently only a handful of studies to the author's knowledge that specifically examine the influence of natural mentors for sexual minority youth (Cohn & Leake, 2012; Darwich, Hymel, & Waterhouse, 2012; Gastic & Johnson, 2009; Johnson & Gastic, 2015; Seil, Desai, & Smith, 2014; Torres, Harper, Sánchez, Fernández, & The Adolescent Trials Medicine Network for HIV/AIDS Interventions, 2012). All but one of these studies found a positive effect of natural mentors on health and educational outcomes for sexual minority youth (these studies are discussed in greater detail below). This provides a basis of knowledge in which to begin to understand the effect of natural mentors in the lives of sexual minority youth. Additional research is needed to discover whether natural mentors are an effective, yet under-utilized and uncultivated, resource in the sexual minority community.

Significance

Neither the mentoring literature, nor the sexual minority youth literature, has focused attention on natural mentors for sexual minority youth. The mentoring literature has examined natural mentors in the lives of other vulnerable populations, such as youth aging out of foster care (Greeson, Usher, & Grinstein-Weiss, 2010), youth with disabilities (Ahrens, DuBois, Lozano, & Richardson, 2010), and African American teen parents (Hurd & Zimmerman, 2010a). With each of these populations, the literature has found that natural mentors act as a signficant protective factor. There is also a growing body of sexual minority youth literature that shows the positive effect of adult social

support (Bouris et al., 2010; Eisenberg & Resnick, 2006; Needham & Austin, 2010; Ryan et al., 2010). However, this literature has mainly focused on parental support, rarely looking at the importance of other non-parental adults in the lives of sexual minority youth.

The current study fills this gap in the literature, making an important contribution to our knowledge of the role of natural mentors in the lives of sexual minority youth in three main ways: 1) it is one of a few studies to examine whether natural mentors differentially impact substance abuse and mental health outcomes for sexual minority and heterosexual youth; 2) it uses a person-centered approach to find and analyze the effect of underlying classes of natural mentoring relationships; and 3) it uses a large, nationally-representative sample of both sexual minority and heterosexual youth.

First, as mentioned, there are very few studies that have explored natural mentors in the lives of sexual minority youth. In fact, there are currently only six studies to the author's knowledge (Cohn & Leake, 2012; Darwich et al., 2012; Gastic & Johnson, 2009; Johnson & Gastic, 2015; Seil et al., 2014; Torres et al., 2012). Three of these studies focus on the effect of school-related mentors on educational outcomes (Gastic & Johnson, 2009) and mental health and substance abuse outcomes (Darwich et al., 2012; Seil et al., 2014). While the two other studies broaden their definition of natural mentor to include family and community members, they focus on very specific populations of sexual minority youth. Torres, Harper, Sánchez, & Fernández (2012) used a sample of 29 gay, male youth ages 18-22 in their qualitative study exploring the overall effect of natural mentors. Cohn & Leake (2012) used Add Health data to examine the effect of natural mentors among rural sexual minority youth. This is also the only study that did

not find a significant effect of natural mentors for sexual minority youth. The most recent study was a preliminary bivariate analysis that used public-use Add Health data to examine differences in natural mentors for sexual minority and heterosexual youth (Johnson & Gastic, 2015). The current study adds to our knowledge by using rigorous analytic methods to explore the associations between many different types of natural mentors and a range of mental health and substance abuse outcomes for sexual minority and heterosexual youth.

Second, the current study extends our knowledge by using both a variable-centered and person-centered approach to explore the relationship between various characteristics of the natural mentoring relationship and health outcomes. A variable-centered approach, such as regression analysis, can help us to understand the unique contribution of each variable. On the other hand, a person-centered approach, such as latent class analysis, explores underlying groups based on multiple indicators. With the exception of one study to the author's knowledge (Hurd & Zimmerman, 2013), our current understanding of natural mentoring relationships includes only the unique effect of individual relationship characteristics on outcomes of interest. Recognizing that all relationships are multi-dimensional, the current study uses latent class analysis to explore empirically derived groups of natural mentoring relationships among young adults based on multiple relationship characteristics.

Finally, the current study uses a large, nationally representative sample of youth. Given that this population is hard to identify and few national studies collect data on sexual orientation, much of the sexual minority youth literature uses small, purposive samples. The National Longitudinal Study of Adolescent to Adult Health (Add Health)

collected information on sexual attraction and behavior in all waves, and collected sexual orientation identity in the third wave, when youth were between the ages of 18-25. As mentioned, a few studies have used Add Health to explore natural mentors among sexual minority youth (Cohn & Leake, 2012; Gastic & Johnson, 2009; Johnson & Gastic, 2015). However, the current study is the first one to use the full sample of youth in Add Health. Cohn & Leake (2012) used a sub-sample of sexual minority youth (i.e., rural sexual minority youth). Gastic & Johnson (2009) and Johnson & Gastic (2015) used a sub-sample of the full dataset (i.e., public-use data).

The current study focuses on several mental health and substance abuse outcomes for which empirical evidence continues to show an increased risk for sexual minority youth in comparison to heterosexual youth. Mental health outcomes include depression, suicide ideation, self-esteem, and life satisfaction. Substance abuse outcomes include marijuana use, other illicit drug use, binge drinking, and drinking-related problems (Saewyc, 2011; IOM, 2011). Given these significant and persistent sexual orientation health disparities, it is critical to find effective interventions to improve outcomes for these vulnerable youth. The current study aims to gain a better understanding of whether natural mentors act as a positive resource for sexual minority youth, ultimately helping to reduce mental health and substance abuse disparities. Findings from the current study make a significant contribution to the social work field by extending our knowledge regarding resiliency among sexual minority youth, as well as filling a gap in the broader adolescent literature on mentorship among vulnerable populations.

CHAPTER II. LITERATURE REVIEW

Health Disparities for Sexual Minorities

Two national health reports – "Healthy People 2020", and "The health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding" – recently acknowledged the need for increased attention and research focused on reducing health disparities for sexual minorities, especially for youth (IOM, 2011; U.S. DHHS, 2010). The Institute of Medicine guided the selection of outcomes for the proposed study, specifically outlining those health disparities that are in critical need of attention among sexual minority youth: depression, suicidality, and substance use and abuse (IOM, 2011). More recently, scholars have called for a shift from focusing on stigma and negative outcomes to examining normative development and positive health outcomes among sexual minority youth (Herrick, Egan, Coulter, Friedman, & Stall, 2014; Jenkins & Vazsonyi, 2013). Given this call, as well as the fact that natural mentors have been shown to have a positive effect on self-esteem and life satisfaction (DuBois & Silverthorn, 2005b), the current study chose to also examine these two mental health outcomes.

Mental Health

Mounting evidence supports the Institute of Medicine's assertion that sexual orientation health disparities are in need of critical attention. As described in the following examples, several studies with various samples and level of rigor provide strong evidence for mental health disparities (Almeida et al., 2009; Marshal et al., 2013; 2011; Needham, 2011; Rosario et al., 2013; Stone et al., 2014). In a cross-sectional study, Almeida (2009) found that LGBT youth scored significantly higher on a scale of depressive symptomology, and were more likely than heterosexual, non-transgendered

youth to report suicide ideation (30% vs. 6%). Similarly, sexual minority youth were significantly more likely than non-sexual minority youth to report suicide ideation (odds ratios between 3.14 and 4.89, depending on their sexual identity) in a study using aggregated data from Youth Risk Behavior Surveys in five communities from 2001 to 2009 (Stone et al., 2014). In a unique sibling comparison study with data collected nationally, Rosario et al. (2013) found that sexual minorities reported more depressive distress than heterosexual youth. A meta-analysis found that sexual minority youth report significantly higher rates of depression and suicidality than their heterosexual peers (Marshal et al., 2011). In two longitudinal studies, both Marshal et al. (2013) and Needham et al. (2011) found that sexual orientation disparities in depressive symptoms and suicidal thoughts persist from adolescence to young adulthood.

While a majority of studies focus on negative mental health disparities, such as depression and suicide, there are some studies that examine positive mental health outcomes, such as self-esteem and life satisfaction (e.g., Bauermeister et al., 2010; Jenkins & Vazsonyi, 2013; Rosario, Schrimshaw, & Hunter, 2010; Toomey, Ryan, Diaz, Card, & Russell, 2013). Only one of these studies, Jenkins and Vazsonyi (2013), compared sexual minority youth to heterosexual youth. They found that sexual minority youth initially had lower levels of self-esteem and happiness than heterosexual youth, but that they showed few differences in the developmental course of these health indicators over time.

Substance Abuse

In addition to mental health disparities, a large and growing body of literature continues to show sexual orientation disparities in substance use among youth

(Newcomb, Birkett, Corliss, & Mustanski, 2014; Rosario et al., 2014; Talley, Hughes, Aranda, Birkett, & Marshal, 2014). Marshal et al. (2008) conducted a meta-analysis of the relationship between sexual orientation and adolescent substance use, and found that the odds of substance use for LGB youth were, on average, 190% higher than for heterosexual youth, and substantially higher within some subpopulations of LGB youth (340% higher for bisexual youth, and 400% higher for females). Newcomb et al. (2014), using pooled data from two years of the Youth Risk Behavior Survey from seven different communities, found that sexual minority youth had a higher prevalence of illicit drug use than heterosexual youth. Sexual minority youth also reported more substance use than heterosexual youth in a sibling comparison study (Rosario et al., 2014).

Talley et al. (2014), using pooled data from the 2005 and 2007 Youth Risk Behavior Surveys, found that sexual minority youth were more likely than heterosexual youth to report several alcohol use and abuse outcomes, including lifetime and past month alcohol use, monthly heavy episodic drinking, earlier onset of drinking, and more frequent past month drinking. Furthermore, alcohol-use disparities were greatest for bisexual youth, females, and younger youth. In a college-based sample of youth, alcohol consumption was similar between heterosexual and sexual minority youth; however, the negative consequences of alcohol use and maladaptive motivations for use (i.e., coping and conformity) were greater for sexual minority youth (Talley, Sher, Steinley, Wood, & Littlefield, 2012).

More rigorous longitudinal studies add to the empirical evidence regarding substance abuse disparities for sexual minorities. Sexual orientation disparities in substance use are consistently found to emerge in early adolescence and persist into

young adulthood (Corliss, Rosario, Wypij, Fisher, & Austin, 2008; Marshal et al., 2013; Needham, 2011). The literature provides inconsistent results about whether substance use disparities stay constant over time (Needham, 2011), or if substance use increases more rapidly for sexual minority youth than heterosexual youth (Marshal, Friedman, Stall, & Thompson, 2009). Additionally, Corliss et al. (2008) found that disparities in alcohol use among sexual minority youth were greatest for those that identify as mostly heterosexual and females who identify as bisexual. Add summary statement

In summary, within the past decade empirical evidence has mounted that consistently shows mental health and substance abuse disparities for sexual minority youth. As is seen in the examples above, these findings persist even as studies become more rigorous and different populations are examined. We must now turn our attention to understanding ways in which we can reduce, and ultimately eliminate, these health disparities.

Parental Support as a Protective Factor

While the knowledge base has grown regarding the risks that sexual minority youth face, we are just beginning to understand the factors that may support these youth, and promote resilience and positive youth development. As Rutter (1985) points out, social support has been a main variable of interest as a protective factor since the beginning of resiliency research. Today, we are still exploring social support as a primary protective factor; support from parents has received much attention in the sexual minority youth research.

Studies have found that parental support is particularly effective in reducing poor mental health and substance abuse outcomes for sexual minority youth (Bouris et al.,

2010; Bregman, Malik, Page, Makynen, & Lindahl, 2012; Diamond et al., 2011; Eisenberg & Resnick, 2006; Langhinrichsen-Rohling, Lamis, & Malone, 2010; Padilla, Crisp, & Rew, 2010; Pearson & Wilkinson, 2012; Reisner, Biello, Perry, Gamarel, & Mimiaga, 2014; Rosario et al., 2014; Ryan et al., 2010; Ryan, Huebner, Diaz, & Sanchez, 2009; Teasdale & Bradley-Engen, 2010; Ueno, 2005). From the literature, two dimensions of parenting emerge as particularly important: 1) parent's knowledge of and response to their child's sexual orientation, and 2) qualities of the parent-child relationship, such as support, caring, and connectedness (Bouris et al., 2010). In their systematic review of parental influences on the health and well-being of LGB youth, Bouris et al. (2010) note that throughout all studies there is a focus on negative parental influences, rather than how parents might positively influence youths' health. It is important to note that the effect of parental rejection is distinct, although related, from the effect of parental acceptance. In other words, just because a parent exhibits low parental rejection, this does not mean that they have high levels of acceptance. As an example, Ryan et al. (2009) found that LGB youth who reported higher levels of family rejection as adolescents were 8.4 times more likely to have attempted suicide, 5.9 times more likely to report high levels of depression, and 3.4 times more likely to report using illegal drugs when compared to those who reported no or low levels of family rejection. Alternatively, family acceptance was found to promote higher self-esteem and protect against depression, suicide ideation, and substance use (Ryan et al., 2010).

In prospective studies using large, nationally-representative datasets, parental support has also been found to mediate the relationship between sexual orientation and several health outcomes, including depression, suicidality, and drug use (Needham &

Austin, 2010; Teasdale & Bradley-Engen, 2010). Similarly, Pearson & Wilkinson (2012) found that same-sex attracted youth had higher levels of depression, binge drinking, and drug use, which was partially mediated by their perceived level of closeness with parents. Interestingly, parental closeness may be less protective against risk behaviors for same-sex attracted males than females (Pearson & Wilkinson, 2012). Parental rejection and sexuality-specific support have also been found to be critical family influences of adolescent LGB identity development (Bregman et al., 2012). Bregman et al. (2012) found that higher levels of parental rejection were associated with greater likelihood of struggling with identity development, and sexuality-specific family support was associated with greater likelihood of having an affirmed identity.

While LGB resiliency research has increased our understanding of the positive impact of supportive parents, we lack knowledge about the impact of other non-parental, important adults present in a sexual minority youth's life. Especially during this developmental stage, where adolescents and young adults are seeking autonomy from parents, natural mentors may be a particular type of non-parental adult support that act as a salient protective factor for sexual minority youth. In fact, the broader positive youth development literature finds that support from a non-parental adult is key to healthy development (Search Institute, 2006).

Natural Mentoring Relationships

Natural mentors are adults who provide a great amount of support and guidance, often beyond the formal role they may serve in a youth's life. DuBois et al. (2005b), using a large, nationally representative sample, found that 72.9% of 18-26 year olds had a natural mentor for at least a year since they were 14 years old. Of these natural mentors,

more than 40% were non-parental family members, another 26% were teachers or guidance counselors, and the rest included coaches, religious leaders, employers, coworkers, neighbors, friends' parents, and doctors or therapists.

Empirical evidence suggests that natural mentors have a positive influence on a range of outcomes, including academic engagement and achievement, psychological wellbeing, and problem behaviors, such as substance abuse and violence (Black, Grenard, Sussman, & Rohrbach, 2010; Hurd & Zimmerman, 2010b; Munson & McMillen, 2009; Sánchez, Esparza, & Colón, 2008; Whitney, Hendricker, & Offutt, 2011; Zimmerman, Bingenheimer, & Notaro, 2002). For example, Black et al. (2010) conducted a longitudinal study of over 3,000 adolescents (average age of 14.8 years) across eight states and found that school-based natural mentors decrease substance use and abuse; however, this influence was via an indirect path through school attachment. Additional studies of natural mentors among youth in the general population have found an association with decreased substance abuse outcomes among adolescents (Zimmerman et al., 2002), as well as increased self-esteem and decreased depressed affect among a nationally-representative sample of young adults ages 18-26 (Whitney et al., 2011). Yet, DuBois and Silverthorn (2005b) failed to find an association between natural mentors and mental health (suicide ideation and depression) and substance abuse (binge drinking and drug use) outcomes. Instead, they found that natural mentors are more likely to affect positive indicators of psychological wellbeing, such as self-esteem and life satisfaction.

Natural Mentoring Relationship Characteristics

Studies have begun to look beyond the sole presence of a natural mentor in a youth's life, and have found that effects are often dependent on contextual factors, as well

as characteristics and qualities of the mentoring relationship (DuBois & Silverthorn, 2005a; Grossman & Rhodes, 2002; Hurd & Zimmerman, 2013; Spencer, 2006; Whitney et al., 2011). For example, research has found that youth benefit the most from relationships that last at least a year, and where there is consistent contact between the youth and mentor (Grossman & Rhodes, 2002). Youth in mentoring relationships that lasted for at least a year had improvements in academic, psychosocial, and behavioral outcomes. In fact, youth in mentoring relationships that ended within three months reported drops in self-worth and perceived scholastic competence (Grossman & Rhodes, 2002).

Greater reported closeness in the mentoring relationship is also predictive of less depressive symptoms and suicide ideation, and greater self-esteem and life satisfaction (DuBois & Silverthorn, 2005a). Hurd and Zimmerman (2013) used latent profile analysis to examine natural mentoring relationships and found that relationships with high levels of closeness and *either* long duration or frequent contact have the greatest effect on psychological wellbeing. In a qualitative study aimed at better understanding the processes at work in the development of close, enduring relationships, Spencer (2006) found four central relationship characteristics: authenticity, empathy, collaboration, and companionship. These high quality relationships – long-term relationships that are emotionally supportive – with adult mentors have been found to have the largest influence on depression, self-esteem, and alcohol use (Whitney et al., 2011).

The social role of natural mentors in a youth's life also has been shown to have an effect on educational and health outcomes. School-related mentors, mostly teachers in particular, have been found to have a positive influence on academic attainment and other

risk outcomes, such as substance use and violence (Black et al., 2010; Fruiht & Wray-Lake, 2012; Gastic & Johnson, 2009). Additionally, DuBois et al. (2005a) found that non-familial mentors predicted greater likelihood of favorable outcomes in education, general health, and drug use, in comparison to familial mentors. Similarly, Hurd, Stoddard, Bauermeister, and Zimmerman (2014) found that the presence of a non-familial mentor, but not a familial mentor, had a significant, negative effect on cigarette, marijuana, and alcohol use. Having a mentor from outside one's family may provide an opportunity for exposure to alternative perspectives and social resources (Hurd et al., 2014).

Natural Mentors & Vulnerable Populations

Large samples that combine all youth could mask certain sub-populations of diverse youth who may receive greater benefit from the relationship (Rhodes & DuBois, 2008). Several studies have found that at-risk youth and youth with high levels of stress benefit the most from natural mentoring relationships (Erickson, McDonald, & Elder, 2009; Rodríguez-Planas, 2014). Furthermore, natural mentoring relationships have been found to be especially effective for vulnerable and marginalized youth, including youth with learning disabilities (Ahrens et al., 2010), youth in foster care (Ahrens, DuBois, Richardson, Fan, & Lozano, 2008; Greeson et al., 2010; Munson & McMillen, 2009), homeless youth (Dang & Miller, 2013), African American youth (Hurd & Zimmerman, 2010b), and African American adolescent mothers (Hurd & Zimmerman, 2010a). Notably, while these studies found that youth and young adults with natural mentors have increased self-esteem, decreased depressive symptoms, and decreased suicide ideation, a

couple of the studies (Hurd & Zimmerman, 2010b; Munson & McMillen, 2009) failed to find an association with substance use and abuse.

Natural Mentors Among Sexual Minority Youth

When considering the subpopulation of sexual minority youth, we know very little about the influence of natural mentors. As mentioned, there are currently only six studies to the author's knowledge that specifically examine the influence of natural mentors for sexual minority youth (Cohn & Leake, 2012; Darwich et al., 2012; Gastic & Johnson, 2009; Johnson & Gastic, 2015; Seil et al., 2014; Torres et al., 2012). Findings from this literature provide knowledge, although limited, in which to base the current study.

Torres et al. (2012) conducted a qualitative study of natural mentors in the lives of thirty-nine gay male youth (ages 15-22). They found that gay youth received substantial support, especially emotional, self-appraisal, and unconditional support, from a variety of natural mentors. Gastic and Johnson (2009), Cohn and Leake (Cohn & Leake, 2012) and Johnson and Gastic (2015) used the National Longitudinal Study of Adolescent to Adult Health to examine the effect of natural mentors for sexual minority youth. Gastic and Johnson (2009) focused on school-related mentors and educational attainment. They found that teacher-mentors provided critical educational support for LGB youth, especially female sexual minority youth of color. While having a mentor of any type was significantly associated with greater post-secondary attendance, the relative benefit of being mentored for sexual minority youth was about 30% less than the benefit for heterosexual youth. On the other hand, Cohn and Leake (2012), when focusing on rural sexual minority youth and psychological distress, found that mentors had no significant

effect. Johnson and Gastic (2015), in bivariate analyses of sexual minority versus heterosexual youth, found that sexual minority youth were more likely to have school-related mentors and less likely to have family mentors. Additionally, they found that sexual minority youth met their mentors almost a year later than heterosexual youth.

Darwich et al. (2012) and Seil et al. (2014) used large samples of high school youth and focused on the effect of school-related adult support on mental health and substance abuse outcomes. Darwich et al. (2012) found that lesbian and gay youth with low levels of adult support in school had the highest levels of substance use. However, there was no difference in substance use based on sexual orientation for those with high levels of school-related adult support. Seil et al. (2014) found that lesbian, gay and bisexual youth without a school-related adult connection (in comparison to heterosexual youth with a school-related adult connection) were 3 to 6.5 times as likely to experience alcohol use, marijuana use, illicit drug use, depression symptoms, suicide ideation, and suicide attempts.

In summary, over a decade of literature has demonstrated the large sexual orientation disparities in mental health and susbtance abuse outcomes for youth. Researchers studying sexual minority youth are now turning their attention to factors that might promote resilience in the face of adversity, with many finding that parental support is a critical protective factor (for review see Bouris et al., 2010). There is a dearth of research, however, that explores adult support for sexual minority youth in contexts outside of the immediate family. This is in spite of the growing body of general adolescent literature that shows the importance of at least one non-parental adult during this developmental stage (for review see DuBois et al., 2011). The limited studies that do

explore non-parental adult support for sexual minority youth have inconsistent findings (Cohn & Leake, 2012; Darwich et al., 2012; Gastic & Johnson, 2009; Johnson & Gastic, 2015; Seil et al., 2014; Torres et al., 2012). The current study adds to this knowledge base in order to better understand the potential of natural mentors to act as a protective factor against poor mental health and substance abuse outcomes for sexual minority youth transitioning to adulthood.

Theoretical Framework

Two theoretical frameworks – minority stress theory (Meyer, 2003) and resiliency theory – guide the current study. Minority stress theory helps us to understand the causal mechanisms, particularly minority-specific stressors, by which sexual minority youth are at greater risk for poor mental health and substance abuse outcomes in comparison to heterosexual youth. Resiliency theory provides a way to conceptualize why some sexual minority youth fair well during adolescence and young adulthood even though they face additive minority-specific stressors.

Minority Stress Theory

The minority stress theory (Meyer, 2003) is one of the most prominent theoretical frameworks that offers an explanation for health disparities among sexual minorities. The minority stress theory is based on the premise that sexual minorities face additional minority-specific stressors on top of general stressors because of their stigmatized social status. The minority stress theory originates in the more general sociological theory of social stress (Dressler, Oths, & Gravlee, 2005; Pearlin, 1989).

Social stress theory posits that those who are in a disadvantaged position in the social structure experience more stressful situations and fewer resources to cope with

these additional stressors. This can lead to increases in mental and physical health issues, ultimately resulting in large health disparities for those at a social disadvantage (Dohrenwend, 2000; Pearlin, 1989). Predominant stressors that affect health related to disadvantaged social status include prejudice and discrimination, which can be directly and indirectly experienced (Williams & Mohammed, 2008). Studies that examined social stress related to race, socioeconomic status, and gender have been used to support this theory (Dohrenwend, 2000; Dressler et al., 2005; Meyer, Schwartz, & Frost, 2008).

Meyer's (2003) minority stress theory distinguishes the excess stress that is unique to those in a stigmatized social status, with particular emphasis on sexual minorities. While researchers first tested this theory with adults, a growing body of empirical evidence provides support for this model among sexual minority youth populations (Almeida et al., 2009; Burton, Marshal, Chisolm, Sucato, & Friedman, 2013; Cox, Dewaele, van Houtte, & Vincke, 2010; Hatzenbuehler, 2011; Rosario, Schrimshaw, Hunter, & Gwadz, 2002; Ryan et al., 2010; Toomey et al., 2013; Ueno, 2005).

Meyer's (2003) minority stress theoretical model (Appendix A) outlines the mechanisms by which a sexual minority's stigmatized status has an effect on mental health outcomes. Before discussing the theoretical model, it is important to recognize that there are three underlying assumptions regarding the concept of minority stress, including: 1) minority stress is unique and additive to general stressors that all people experience; 2) minority stress is chronic; and 3) minority stress stems from social processes, institutions and structures that are beyond the individual (Meyer, 2007).

Turning to the theoretical model, it is also noteworthy that minority status is overlapping environmental circumstances, illustrating the relationship between one's

minority status and the advantages and disadvantages one might experience related to other factors in their environment (Meyer, 2003). For example, a sexual minority youth may be living in a home with domestic violence or low socioeconomic status. Circumstances in the environment lead to general stressors, such as family separation or divorce, which also overlap with their minority-specific stressors.

The minority stress theory describes minority-specific stressors along a continuum from distal to proximal. Distal stressors are objective events and conditions. In other words, they do not depend on one's perceptions and can be seen as separate from one's minority identity. On the other hand, proximal stressors are subjective – dependent on one's perceptions – and are therefore related to one's self-identification with a minority status. Distal stressors include both chronic and acute discrimination and prejudice. Proximal stressors include expectations of discrimination and the vigilance that expectation requires, concealment of one's sexual orientation, and internalization of negative societal attitudes (Meyer, 2007). Proximal and distal stressors are also depicted as overlapping, illustrating their interdependence. For example, experiencing anti-gay bullying in school may lead a sexual minority to conceal their identity or internalize these negative values.

Characteristics of one's minority identity, namely prominence, valence and integration, may modify the effect of stressors on mental health outcomes. Prominence relates to the saliency of one's sexual minority identity, which may intersect with other personal and social identities. As prominence of one's sexual minority identity increases, so too does the impact of stressors on health outcomes (Thoits, 1999). Valence refers to self-acceptance of one's identity. Valence often has an inverse relationship with mental

health outcomes and most likely increases the impact of the stressor (Meyer, 2007). Integration is the relationship of one's minority identity with their other identities. Difficulties in developing an integrated sexual minority identity can have a negative impact on depression, anxiety, conduct problems, and self-esteem (Rosario et al., 2010).

Informed by both the minority stress model and the knowledge that a central developmental task of adolescence and young adulthood is identity development (Arnett, 2000; Erikson, 1959), disparities in health outcomes may be particularly substantial for sexual minority youth. In addition to the general stressors of adolescence and young adulthood, sexual minority youth often face increased stressors during this developmental stage, as they are developing identities that are counter to societal norms of heterosexuality. Sexual minority youth, in particular, find themselves negotiating and developing their identities within multiple contexts from adolescence to young adulthood (Ott, Corliss, Wypij, Rosario, & Austin, 2010).

Minority-specific stressors that sexual minority youth often experience include, but are not limited to, physical and emotional violence (Burton et al., 2013), school bullying (Russell, Everett, Rosario, & Birkett, 2014), family rejection (Ryan et al., 2009), concealment, the stress of "coming out" (i.e., disclosing a sexual minority orientation to oneself and others), and internalized homophobia (i.e., beliefs that societal stereotypes and negative attitudes about LGB people are legitimate, resulting in negative feelings about oneself) (Rosario et al., 2010; Shilo & Mor, 2014). As described in the minority stress theory, these increased stressors lead sexual minority youth to suffer from emotional distress and maladaptive coping mechanisms, such as suicidality and substance abuse (Meyer, 2003).

The minority stress theory also elucidates the fact that minority identity is not only a source of stress; many sexual minority youth also experience positive coping mechanisms that may modify the effect of stressors on health outcomes, such as social support and group cohesiveness as a result of their minority identity (Meyer, 2003). For example, the experience of coming out may provide an opportunity for sexual minority youth to learn how to cope with and overcome the adverse effects of stress. There are also benefits of affiliation with sexual minority groups and communities. The non-stigmatizing environment and support provided when experiencing minority-specific stressors have been shown to act as an important protective factor against poor health outcomes (Heck, Flentje, & Cochran, 2011; Poteat, Sinclair, DiGiovanni, Koenig, & Russell, 2012). These are examples of resiliency factors that may help explain why some sexual minority youth are able to navigate the adolescent and emerging adulthood years quite successfully, often *despite* the stigma and discrimination they face (Saewyc, 2011).

Resiliency Theory

Resiliency theory provides a conceptual framework that uses a strength-based approach to focus attention on the factors that may help youth to overcome adversity and risk. Research on resilience examines the processes in a person's life that account for positive outcomes (or at least the reduction of negative outcomes) in the face of risk factors (Masten, 2001). Given the term resilience is used in a variety of ways in different contexts, it is necessary to first provide a definition of this concept.

At its most basic definition, resilience is the positive adjustment among youth who have been exposed to one or more risk factors (Fergus & Zimmerman, 2005). Resilience can be considered an individual characteristic, an outcome, or a process.

Exhibiting flexibility and good problem-solving skills to overcome a risk are examples of resilience as an individual characteristic. Using individual assets and environmental resources to help overcome a risk illustrates resilience as a process. Resilience as an outcome is when someone has successfully overcome exposure to a risk. It is important to note that resilience is not an immutable quality of an adolescent (National Scientific Council on the Developing Child, 2015). In other words, resilience changes depending on the context, the population, the risk, the resiliency factor, and the outcome (Fergus & Zimmerman, 2005).

The origins of resilience research in the behavioral sciences began to emerge in the 1970s. There were several early pioneers of resilience research, including Manfred Bleuler, Lois Murphy, Irving Gottesman, Michael Rutter, Norman Garmezy and Emmy Werner (Zolkoski & Bullock, 2012). Many of these early researchers were driven by a desire to understand, prevent, and treat mental health problems and major threats to development (Masten, 2007). Of particular note is Garmezy, Masten and Tellegen's (1984) work in defining the three models of resilience that explain how individual and environmental factors work to reduce the adverse effects of risk, which include: 1) the compensatory model, 2) the protective factor model, and 3) the challenge model. These are the major conceptual models that currently inform resiliency theory.

In the compensatory model, there is a direct and independent relationship between the resilience factor and the outcome when accounting for the risk factor (Fergus & Zimmerman, 2005). In other words, the resilience factor neutralizes (or dampens) the risk. These models are usually tested with a multiple regression analysis where both factors are entered into the equation at one time. In the protective factor model, the

resilience factor interacts with the risk factor to reduce the probability of a negative outcome (Zolkoski & Bullock, 2012). These models are most often tested with moderation in a multiple regression analysis or group comparisons in structural equation modeling. Finally, in the challenge model, there is a curvilinear relationship between the risk and outcome in the presence of a resilience factor. The risk actually enhances competence, as long as it is not too extreme (Garmezy et al., 1984). In other words, overcoming moderate levels of stress actually provide a benefit by helping to build resilience. Challenge models are typically tested with polynomial terms in a regression analysis and longitudinal research designs.

Resiliency theory outlines two types of promotive factors that help individuals avoid the negative effects of risks: assets and resources. Assets are factors that reside within the individual, such as coping skills and self-efficacy. Resources are factors in the environment that are external to the individual, such as parental support and community organizations. Resilience results from a combination of these internal predispositions and external experiences (Rutter, 2012).While resilience research has shown that the ability to adapt and thrive comes from an interaction between assets and resources, "the single most common finding is that children who end up doing well [despite adversity] have had at least one stable and committed relationship with a supportive parent, caregiver, or other adult" (National Scientific Council on the Developing Child, 2015, p. 1). These relationships not only provide support, care, and protection, but they also help to build key internal capacities, such as the ability to plan, monitor and regulate behavior, and adapt to changing circumstances (National Scientific Council on the Developing Child, 2015).

Natural mentors are especially well positioned to affect positive outcomes for youth for several reasons: 1) they typically occur within a young person's existing social network; 2) they are often maintained over a significant portion of a youth's development; and 3) the natural mentor often has an important role in contexts and activities that are salient in the lives of youth (DuBois & Silverthorn, 2005b). Furthermore, natural mentors provide support that is unique from that provided by parents and peers. Specifically, youth can turn to non-parental adults for advice and support from an adult perspective without the threat of negative consequences (e.g. embarrassment or punishment) that might come from disclosing information to parents or peers. Youth may allow themselves to be more vulnerable with mentors than they are with parents or peers, leading them to share more personal and sensitive information (Hurd & Sellers, 2013).

Rhodes' (2005) developmental model of youth mentoring relationships provides greater insight into the reasons *why* the reliable presence of at least one supportive adult is so important to resilience in youth (Appendix B). Rhodes (2005) proposes three interconnected processes of development – social-emotional, cognitive, and identity – that form the pathway through which a mentoring relationship promotes positive youth development. When specifically considering the effect of mentors for sexual minority youth, the social-emotional and identity developmental pathways may be the most relevant.

Social-emotional development occurs when mentors model caring adult relationships and provide support, challenging negative views that youth may hold of themselves or of relationships with adults. This ultimately alters a youth's working model

(Bowlby, 1969) and allows them to imagine and pursue alternative realities (Rhodes, 2005). Additionally, the social-emotional development facilitated by mentoring may generalize to improved social functioning with parents and peers (Rhodes, Spencer, Keller, Liang, & Noam, 2006). Finally, mentors can model positive behaviors and help youth to better understand, express, and regulate their emotions, and in so doing, facilitate effective coping (DuBois et al., 2011).

Natural mentors have the capacity to signficantly influence positive identity development, especially for sexual minority youth. Unlike other youth who develop and integrate their identities within a like-identity family, sexual minority youth are often completing this important task within families that identify as heterosexual, and a society that is hetero-normative. By caring and showing support, mentors help youth to challenge negative views from society that they may have internalized, increasing their self-esteem and self-efficacy (DuBois et al., 2011). Relationships with mentors may help to shift a youth's current and future conceptions of self. The possibility of who they might become shifts after observing the important adults in their lives (Rhodes et al., 2006). Furthermore, social opportunities that mentors provide may facilitate identity development by providing youth with positive experiences on which to create their sense of self (Rhodes et al., 2006).

Recent studies have tested Rhodes' (2005) developmental model, with findings that may be particularly salient for sexual minority youth (Hurd et al., 2014; Hurd, Sánchez, Zimmerman, & Caldwell, 2012). For example, Hurd et al. (2014) found an indirect relationship between natural mentor presence and mental health and substance use via coping and life purpose. In other words, having a natural mentor increased a

youth's coping skills and sense of life purpose, which in turn decreased depression, anxiety, and substance use (with the exception of a positive relationship between coping and alcohol use). Qualitiatve studies have found that sexual minorities often attribute their success in several outcomes, including mental health, identity formation and integration, and educational attainment, to supportive adults in their lives (McCleaf, 2014; Sheran & Arnold, 2012; Yarbrough, 2004).

Given that resiliency theory focuses on the environmental factors that may promote resilience in the face of risk, it provides a particularly useful framework for assessing the influence of natural mentors for sexual minority youth. However, there are few studies that formally test models of resilience among sexual minority youth (Fergus & Zimmerman, 2005; Mustanski, Newcomb, & Garofalo, 2011). Two recent studies that did test formal models found that family and peer support are compensatory, but not protective, resources for sexual minority youth against poor mental health outcomes (Mustanski et al., 2011; Reisner et al., 2014).

Guided by both minority stress theory and resiliency theory, the current study tests both compensatory and protective factor models of resilience for the effect that natural mentors have on the relationship between sexual orientation and mental health and substance abuse outcomes. Furthermore, the current study goes beyond just the presence of a natural mentor as a resiliency factor. It also tests compensatory and protective factor models of resilience for the unique associations between specific characteristics of the natural mentoring relationship and health outcomes. Finally, recognizing that all relationships are multi-dimensional, the current study further extends our knowledge by using latent class analysis to explore the combined impact of several

characteristics of the natural mentoring relationship. This is outlined in greater detail below in the study aims, research questions, and conceptual models.

Study Aims, Research Questions, and Conceptual Models

Study Aim 1: To examine disparities in mental health and substance abuse outcomes between sexual minority and heterosexual youth, ages 18-26, and whether natural mentors act as a resource that lessens these disparities.

> **Research Question 1:** Is there a relationship between sexual orientation and mental health and substance abuse outcomes?
>
> **Research Question 2:** Is there a relationship between the presence of a natural mentor and mental health and substance abuse outcomes?
>
> **Research Question 3:** Does the relationship between sexual orientation and mental health and substance abuse outcomes differ based on the presence of a natural mentor?

Study Aim 1a: To examine whether there is a differential effect of natural mentors based on subpopulations of sexual minority youth (i.e. mostly heterosexual, bisexual, and lesbian/gay).

> **Research Question 4:** Does the relationship between sexual orientation and mental health and substance abuse outcomes differ based on the presence of a natural mentor when using a four-category definition of sexual orientation (i.e., heterosexual, mostly heterosexual, bisexual, and lesbian/gay)?
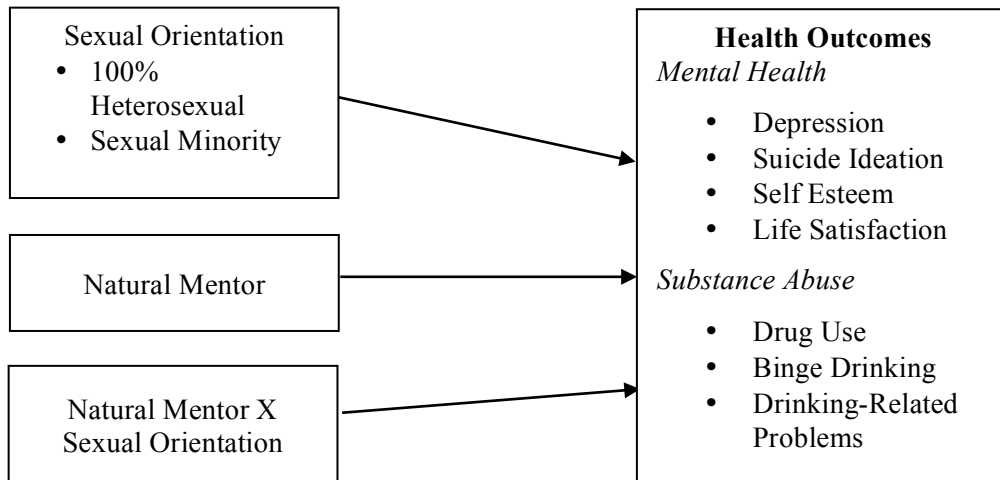
Figure 1: Aim 1 Conceptual Model

Study Aim 2: To investigate the unique contribution of various conditions of the natural

mentoring relationship for sexual minority youth in comparison to heterosexual youth.

> **Research Question 5:** Do any of the following characteristics of the natural
>
> mentoring relationship have a significant association with mental health and
>
> substance abuse outcomes: mentor's social role, mentor's functional role,
>
> perceived closeness, frequency of contact, and length of relationship?
>
> **Research Question 6:** Do the significant associations between relationship
>
> characteristics and mental health and substance abuse outcomes found in RQ5
>
> differ based on sexual orientation?
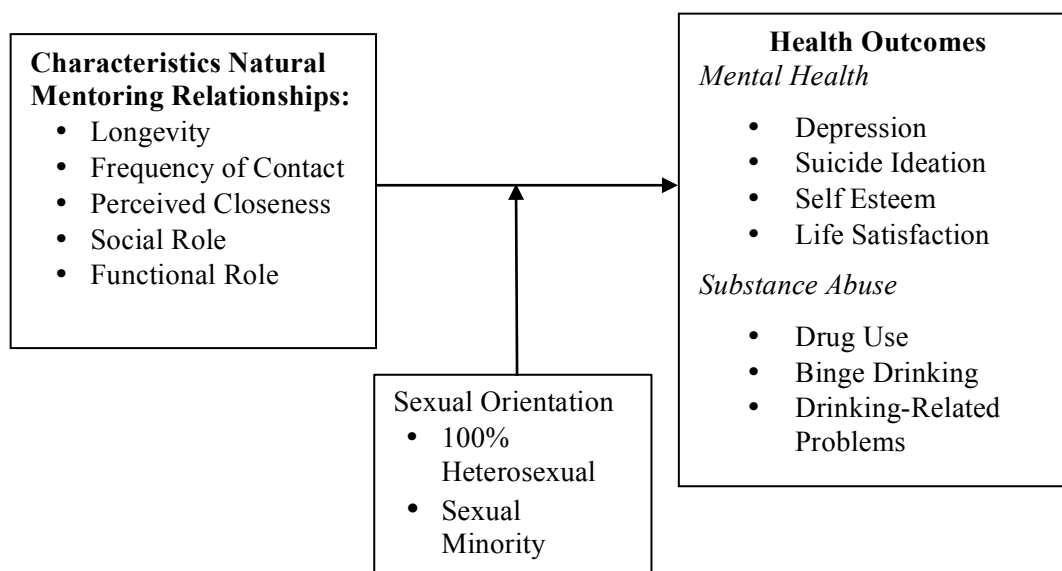
Figure 2: Aim 2 Conceptual Model

Study Aim 3: To explore latent classes of natural mentoring relationships among both

sexual minority and heterosexual youth based on characteristics of the relationship.

Research Question 7: What are the underlying classes of natural mentoring

relationships among young adults based on characteristics of the relationship

(mentor's social role, stage of development in which the mentor became

important, length of the relationship, perceived closeness, and frequency of

contact)?

Research Question 8: Are there differences across classes based on sexual

orientation, gender, race/ethnicity, age, or educational attainment?

Research Question 9: Is there a relationship between latent class membership

and mental health and substance abuse outcomes?

Research Question 10: Does the relationship between latent class membership

and mental health and substance abuse outcomes differ based on sexual

orientation?
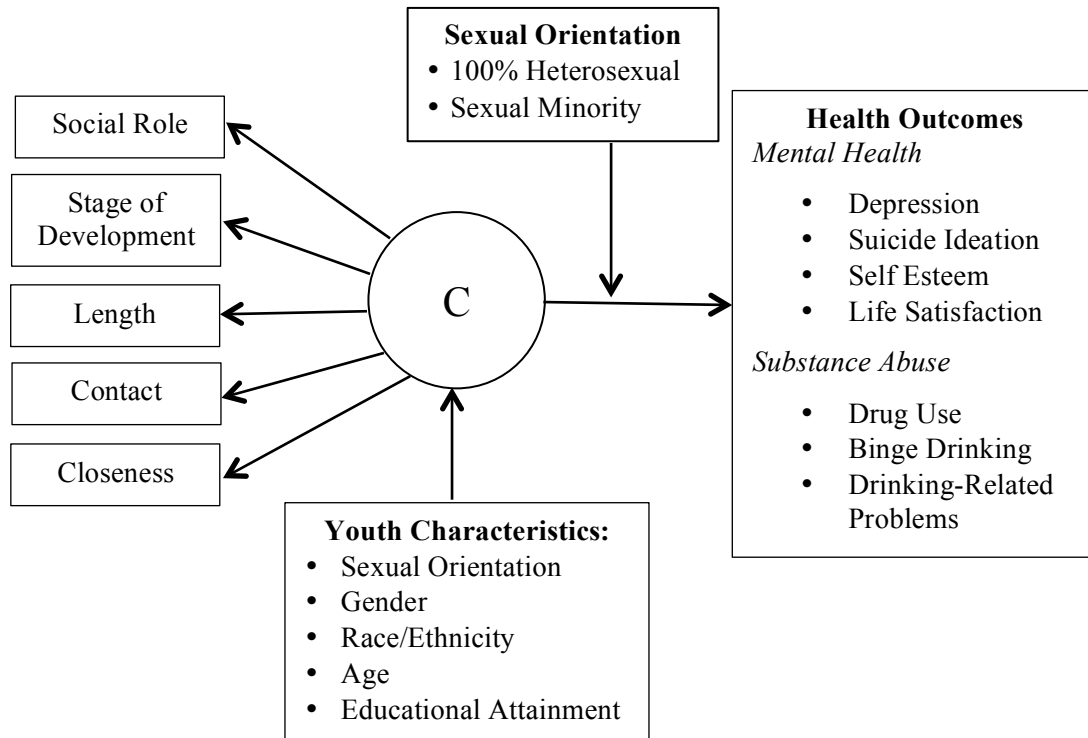
Figure 3: *Aim 3 Conceptual Model*

Overall, with guidance from the theoretical framework and the above conceptual models, the current study aims to better understand whether natural mentors act as a positive resource for sexual minority youth. Given that the current study uses a large, nationally representative sample of both sexual minority and heterosexual youth, it is possible to examine both compensatory and protective models of resilience. In this way, there is the potential to determine whether natural mentors help to reduce sexual orientation disparities in mental health and substance abuse outcomes. Using both a variable-centered and person-centered approach to examine the presence and characteristics of natural mentoring relationships, the current study adds to the limited knowledge base regarding natural mentors among sexual minority youth.

CHAPTER III. METHODS

The study uses the restricted-use National Longitudinal Study of Adolescent to Adult Health (Add Health) dataset. The chapter begins by providing detailed information about the Add Health data collection procedures and sampling strategy, as well as the samples used for each aim in the current study. The current study design and measures are then discussed. The chapter concludes with a presentation of the relationship between the study aims and statistical analyses. This includes an in-depth description of latent class analysis.

Data and Study Sample

Add Health is a longitudinal study of a nationally representative sample of adolescents who were in grades 7 – 12 (ages 12-19) in the United States in 1994-1995. These youth have been followed throughout adolescence, the transition into adulthood (ages 18-26; 2001-2002), and into young adulthood (ages 24-32; 2007-2008) with four in-home interviews that collected data regarding social contexts and their influence on adolescent health. Add Health provides a unique opportunity to study how individual and contextual factors in adolescence are related to health and achievement outcomes in young adulthood. Wave I collected data via an in-school questionnaire from youth in 80 high schools and 52 middle schools. They used multistage stratified sampling methods based on region, urbanicity, school type, racial composition, and school size. Oversampling occurred based on ethnicity (Cuban, Puerto Rican, and Chinese), genetic relatedness to siblings (twins, full sibs, half sibs, and unrelated adolescents living in the same household), adoption status, disability, and black adolescents with highly educated parents (Chen & Chantala, 2014).

A sub-sample of the 90,118 youth who completed in-school questionnaires was selected for an in-home interview at Wave I (n=20,745; mean age = 15.75 years). Wave II consisted of interviews with the same sample one year later. Wave III was a follow-up interview with original Wave I interview respondents as they entered the transition to adulthood in 2001-2002, when they were between the ages of 18-28 (n=15,197; mean age = 21.96 years). Finally, in 2007-2008, Wave IV interviews were conducted with original Wave I interview respondents as they entered young adulthood (15,701; mean age = 28.23) The response rates for Waves I, II, III, and IV were 78.9, 88.2, 77.4, and 80.3%, respectively (Harris et al., 2009). Add Health recruited an additional 687 youth who were not part of the original sampling frame at Wave II in order to increase the genetic sample. These youth do not have a valid sample weight for Wave III, and are therefore not included in the current study (Chen & Chantala, 2014).

The study sample varies for each of the major aims. Specifically, for Aim 1 the study used all youth interviewed at Wave III who provided a valid response for all measures used in the analyses (n=14,080). For Aim 2, the study used a further sub-sample of only those youth who identified a natural mentor who became important in adolescence (i.e., at age 18 or younger). Specifically, youth were included in the analysis if they said that they had a relationship for at least two years with a non-parental adult, not including a peer, partner/spouse, or younger sibling, who had a positive impact on their lives since they were 14 years old (n=6,352). Aim 3 also only included those youth who identified a natural mentor. However, because Aim 3 was more exploratory in nature, the current study broadened the definition of natural mentor to include all youth who ever had a natural mentor, including those who became important during young

adulthood (i.e., after age 18). Even though the Aim 3 analyses included youth with natural mentoring relationships that began past adolescence, it still only considered those relationships that had lasted for at least two years (n=6,801).

Study Design & Measures

Although Add Health is a longitudinal study, the current study design is cross-sectional, using only data from Wave III (2001-2002). The decision to conduct a cross-sectional study was made because the most pertinent variables, including questions about natural mentoring relationships and sexual orientation identity, are only found in Wave III. All measures, including independent, dependent, and control variables, are from Wave III of the Add Health data.

There are two main categories of dependent variables in the current study: mental health and substance abuse outcomes. Four constructs measure mental health outcomes, including depression, suicide ideation, self-esteem, and life satisfaction. Four constructs measure substance abuse, including marijuana use, other illicit drug use, binge drinking, and drinking-related problems. All dependent variables were dichotomized for ease of interpretation across outcomes.

The primary independent variables were sexual orientation, natural mentorship, and several characteristics of the natural mentoring relationship. These characteristics include the mentor's social role, the stage of development at which the mentor became important, longevity of the relationship, frequency of contact, youth's perceived closeness with his/her natural mentor, and the mentor's functional role. Finally, we control for youth's gender, age, race/ethnicity, educational attainment, and childhood

poverty. Each of these variables is explained in further detail below. Table 1 provides

descriptive statistics on all variables, stratified by sexual orientation.

Dependent Variables

Depression was operationalized with the 9-item abridged version of the Center for

Epidemiologic Studies Depression Scale (CES-D) used in Wave III of Add Health. The

full version of the CES-D includes 20 items and is designed to measure depressive

symptomology in the general population (Radloff, 1977). Add Health asked respondents

the following question: How often was each of the following true in the last seven days?

1) You were bothered by things; 2) you could not shake off the blues; 3) you felt just as

good as other people; 4) you had trouble keeping your mind on what you were doing; 5)

you were depressed; 6) you were too tired to do things; 7) you enjoyed life; 8) you were

sad; and 9) you felt that people disliked you. Response scales for these items ranged from

0 (*never or rarely*) to 3 (*most or all of the time*). In the current study, two items were

reverse coded (*felt as good as others* and *enjoyed life*) and summed to create a CES-D

scale score where lower scores indicate fewer symptoms of depression. In the current

study, the 9-item CES-D scale was internally consistent (Cronbach $\alpha = 0.81$).

In the 20-item CES-D scale a cutoff score of ≥ 16 (scores range from 0-60) is a

commonly used threshold, first developed by Comstock and Helsing (1976), to indicate

the likelihood of clinical depression. This point corresponds approximately to the 80th

percentile of the CES-D score distribution, with similar results replicated in several

national studies (Radloff & Locke, 1986). The current study translated the cutoff score of

≥ 16 in the full CES-D scale to a comparable cutoff score in the shorter 9-item CES-D

scale (scores range from 0-27). Following Gotlib, Lewinsohn, & Seeley (1995), the

current study used a cutoff that was one standard deviation above the sample mean to

identify those who may be considered at least moderately depressed (i.e., a score of ≥ 8).

This cut point was chosen because it provides the optimal balance between sensitivity

and specificity of this measure (Gotlib et al., 1995). In addition, a score of ≥ 8

corresponded to the 80th percentile of the CES-D scale distribution in the current study

sample, similar to what has been found using the full 20-item CES-D scale (Radloff &

Locke, 1986). The final variable used in the current study was dichotomized, with those

scoring ≥ 8 considered at least moderately depressed.

Suicide ideation was measured with a question that asked: during the past 12

months, have you ever seriously thought about committing suicide? Binary response

categories included (0) no and (1) yes. A youth was considered to have suicide ideation if

their response was yes to this question.

Self Esteem was operationalized using four items from the Rosenberg Self Esteem

Scale that were measured in Wave III of Add Health. The full Rosenberg Self Esteem

Scale is a 10-item Likert-type scale that is used to measure global self esteem

(Rosenberg, 1965). Add Health asked respondents about their level of agreement with the

following four statements: 1) you have many good qualities; 2) you have a lot to be proud

of; 3) you like yourself just the way you are; and 4) you feel you are doing things just

about right. Response scales for these items ranged from 1 (*strongly disagree*) to 5

(*strongly agree*), with total scale scores ranging from 4 – 20. In the current study, the 4-

item Rosenberg Self Esteem scale used in Add Health was internally consistent

(Cronbach $\alpha = 0.78$). Following Ahrens, DuBois, Lozano, and Richardson (2010) and

DuBois and Silverthorn (2005a), the current study dichotomized this variable at the

median so that final response categories were: (0) low self esteem, and (1) high self esteem.

Life Satisfaction was measured with a question that asked: how satisfied are you with your life as a whole? The Likert response scale for this item ranged from 1 (*very satisfied*) to 5 (*very dissatisfied*). The current study first reverse coded this item for ease of interpretation so that those who had a higher score were more satisfied with life. This item was then dichotomized at the median so that final response categories were: (0) low life satisfaction, and (1) high life satisfaction.

Marijuana Use was operationalized with a question that asked: during the past 30 days, how many times have you used marijuana? Responses ranged from zero to 600, and were dichotomized into the following categories: (0) no marijuana use, and (1) marijuana use at least once in the past 30 days.

Other Illicit Drug Use was operationalized using three retrospective questions where respondents were asked to report on how many times over the past 30 days they have used: 1) any kind of cocaine; 2) crystal meth; and 3) any other type of illicit drug, such as LSD, PCP, ecstasy, mushrooms, inhalants, ice, heroin, or prescription medicines not prescribed by a doctor. All three items were summed to create a scale, with higher scores indicating greater drug use. The total scale scores ranged from zero to 97, and were dichotomized into the following categories: (0) no illicit drug use, and (1) illicit drug use at least once in the past 30 days.

Binge Drinking was measured with a single retrospective question that asked youth to report on how many days they drank five or more drinks in a row in the past 12 months. Likert scale response categories included: (0) *never*; (1) *one or two days in the*

past 12 months; (2) *once a month or less*; (3) *two or three days/month*; (4) *one or two days/week*; (5) *three to five days/week*; (6) *every day/almost every day*. In the current study, this item was dichotomized into the following categories: (0) no binge drinking in the past 12 months, and (1) binge drinking at least once in the past 12 months.

Drinking-Related Problems measures symptoms of alcohol abuse by asking respondents to report on the number of times in the past year that their alcohol use has caused them problems in five life domains: 1) they got into a sexual situation that they later regretted because they were drinking; 2) they got into a physical fight because they were drinking; 3) their drinking caused problems at school/work; 4) with friends; or 5) with someone they were dating. Likert scale response categories included: (0) *never*; (1) *once*; (2) *twice*; (3) *three to four times*; (4) *five or more times*. In the current study, all five items were summed to create a scale, with higher scores indicating a larger amount of drinking-related problems (total scores ranged from 0 – 20). This item was then dichotomized into the following categories: (0) no drinking-related problems in the past year, and (1) at least one drinking-related problem within the past year.

Independent Variables

Sexual orientation identity was measured with a single, self-report in which respondents were asked to choose which description best fit how they thought about themselves: 100% heterosexual (straight); mostly heterosexual (straight) but somewhat attracted to people of your own sex; bisexual – that is, attracted to men and women equally; mostly homosexual (gay) but somewhat attracted to people of the opposite sex; 100% homosexual (gay); or not sexually attracted to either males or females. Consistent with previous studies (Corliss et al., 2008; McLaughlin, Hatzenbuehler, Xuan, & Conron, 2012), the current study combined mostly heterosexual with the sexual minority category,

forming a dichotomous measure: (0) 100% heterosexual, and (1) sexual minority. Table 2

provides additional evidence for including mostly heterosexual within the sexual minority

category. For an exploratory analysis of sexual minority sub-populations, as suggested by

Loosier (2010) and Vrangalova and Savin-Williams (2012), the proposed study used an

expanded measure of sexual minority with three response categories: (0) mostly

heterosexual; (1) bisexual; (2) lesbian or gay (LG). For the current study, people who

were not sexually attracted to either males or females were excluded (n=76). Given that

this is a sensitive question that may be subject to response bias, it was asked during the

computer assisted self-interview (CASI) portion of the interview.

Natural mentor presence was measured with a single retrospective question:

Other than your parents or step-parents, has an adult made an important positive

difference in your life at any time since you were 14 years old? Consistent with previous

studies of natural mentors (Ahrens et al., 2010; Munson & McMillen, 2009; Rhodes et

al., 2006), those youth who identify a younger sibling, peer, or partner/spouse were not

considered mentored. All youth who identified an adult natural mentoring relationship

(NMR) that lasted for at least two years (Grossman & Rhodes, 2002) were included in the

analysis. Final response categories were: (0) not mentored, and (1) mentored. As

explained earlier, all regression analyses for aims 1 and 2 included only those youth with

a natural mentor who became important in adolescence. Aim 3 broadened the definition

of natural mentor to all youth who ever had a natural mentor, including those who

became important during young adulthood (i.e., after age 18).

Mentor's social role was measured with a single question that asked youth to

identify how they were related to their natural mentor. Respondents chose from a list of

21 different social roles, which were combined into three categories for the current study: (1) kin-mentor (i.e., older sibling, grandparent, Aunt/Uncle); (2) school-mentor (i.e., teacher/guidance counselor, coach/athletic director); and (3) community-mentor (i.e., religious leader, employer, co-worker, neighbor, friend's parent, doctor/therapist/social worker). Those who identified a mentor's social role as "other" were excluded from the analysis. This categorization was similar to other studies exploring the effects of natural mentoring relationships using Add Health data (Fruiht & Wray-Lake, 2012).

Stage of development at which the natural mentoring relationship began was measured with a single question that asked youth to identify how old they were when their natural mentor first became important in their lives. Responses ranged from 0 to 25 years old, and was categorized into the following three developmental stages: (1) pre-adolescence (i.e., 0 to 11 years old); (2) adolescence (i.e., 12 to 18 years old); and (3) young adulthood (i.e., 19 to 25 years old). This variable was only used in the latent class analyses because Aims 1 and 2 did not include mentors who became important at all stages of development (i.e., after adolescence).

Longevity of the relationship was measured with a single question that asks youth to identify for how many years their natural mentor has been important in their lives. Responses ranged from 1 to 27 years. Those whose relationship lasted less than two years (n=817) were considered non-mentored in the current study. This variable was normally distributed (skewness = 0.86; the current study used the general rule of thumb that a variable is considered skewed when it is between -1 and 1), and it was mean-centered in the regression analyses because there was no meaningful zero. In the latent class

analyses, longevity was dichotomized at the mean into the following categories: (0) length of relationship below average, and (1) length of relationship above average.

Frequency of contact was operationalized using two questions where respondents were asked to report on how often they: 1) see their natural mentor; 2) talk with their natural mentor on the phone or exchange e-mail or letters. Likert scale response categories included: (0) *not at all*; (1) *less than once a year*; (2) *about once a year*; (3) *every few months*; (4) *about once a month*; (5) *about once a week*; (6) *two to five times a week*; (7) *almost every day*. In the current study, the two items were summed to create a scale, with higher scores indicating more frequent contact. The total scale scores ranged from 0-14 and the final variable was normally distributed (skewness = -0.17). For the latent class analyses, this variable was dichotomized at the mean (approximately once a month) into the following categories: (0) contact below average, and (1) contact above average.

Current perceived closeness was measured with a single question that asks youth to identify how close they feel to their mentor these days. Likert scale response categories included: (0) *not close*; (1) *only a little close*; (2) *somewhat close*; (3) *quite close*; (4) *very close*. In the current study, this variable was treated as continuous for the regression analyses and normally distributed (skewness = -0.64). For the latent class analyses, this variable was dichotomized at the mean into the following categories: (0) closeness below average, and (1) closeness above average.

Mentor's functional role was measured by a retrospective, open-ended question that asked respondents what their natural mentor did to help them. Add Health researchers coded responses into functional role categories: (1) *guidance and advice* (e.g.,

"gave good advice," "helped me stay out of trouble"); (2) *emotional support* (e.g., "believes in me," "always there for me"); (3) *instrumental or practical support* (e.g., "takes me places," "financial help"), (4) *being like a parent* (e.g., "acted like a mom to me"); (5) *like a friend* (e.g., "provides companionship"); (6) *served as a role model* (e.g., "an inspiration in my life," "I tried to follow in his footsteps"). Those who identified a mentor's functional role as "other" were excluded from the analysis. It is important to note that these categories are not mutually exclusive. In other words, an individual's response could be coded in more than one category. Each of the individual roles was used as an independent variable in the regression analyses. Therefore, reference categories corresponded to the mentor *not* providing that specific functional role.

Control Variables

Several control variables from Wave III were used based on availability in the dataset and review of pertinent literature. The control variables included: *age* (in years and mean-centered; range 18-28); *gender* (0=male, 1=female); *race/ethnicity* (0=Non-Hispanic white, 2=Non-Hispanic African American/black, 3=Hispanic, 4=other[2]); *educational attainment* (0=did not complete high school, 1=high school diploma/GED, 2=at least some post-secondary education); and *childhood poverty* (0=*did not* receive public assistance in household before age 18, 1=*did* receive public assistance in household before age 18).

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[2] Other includes those who identified as Asian, Native American, Multi-Racial, and Other. These categories were combined because of small sample sizes among sexual minority youth.

Statistical Analyses

The overall purpose of the current study is to explore the role of natural mentoring relationships in improving mental health and substance abuse outcomes for sexual minority youth. Specifically, the current study first examined whether the presence of a natural mentoring relationship reduced the disparity in mental health and substance abuse outcomes between sexual minorities and heterosexuals (Aim 1). Second, the current study assessed the effect of various characteristics of the natural mentoring relationship on mental health and substance abuse outcomes, and whether these effects vary based on sexual orientation identity (Aim 2). Finally, the current study explored latent classes of natural mentoring relationships, including differences in youth characteristics across classes, associations between latent classes and mental health and substance abuse outcomes, and sexual orientation-based differences in these relationships (Aim 3).

The current study used STATA 13 for all univariate, bivariate, and regression analyses. MPlus 7.1 was used for all latent class analyses. All analyses incorporated study design features; that is, the study used weights to adjust standard errors for clustering and stratification created by the complex sampling design (Chantala & Tabor, 2010). Specifically, the Add Health sample design used a stratified cluster design, with school as the primary sampling unit, stratified by region. Additionally, the study used the trimmed grand sample weights (to eliminate weights greater than 6,000) provided by Add Health, which ensured that the weighted sample reflected 1995 Current Population Survey estimates of the size of each grade, sex, and race (black vs. non-black) subpopulation.

Statistical Analysis Related to Each Study Aim

The current study began the statistical analysis with univariate procedures and preliminary data screening to understand the basic characteristics of the sample. Data

were assessed for violations of assumptions of normality and linearity, as well as problematic missing data patterns. A series of bivariate statistical analyses were performed to test for initial differences based on sexual orientation identity.

Presence of a Natural Mentor

In order to address the first aim, a series of binary logistic regression models were run for each outcome with the full study sample (n=14,080). The first regression model was the main effects model, looking at the relationships between sexual orientation and natural mentor presence with each outcome while controlling for gender, age, race/ethnicity, educational attainment, and childhood poverty. Next, an interaction term was included in the model to test for differences in the relationship between sexual orientation and each outcome based on the presence of a natural mentor.

As mentioned, the current study tested for the effect of collapsing *mostly heterosexual, bisexual,* and *100% lesbian/gay* into one category (*sexual minority*) in order to create a dichotomous sexual orientation variable. As suggested by Loosier (2010) and Vrangalova and Savin-Williams (2012), the current study ran a sensitivity analysis in which a series of binary logistic regression models compared outcomes between the three sexual minority sub-categories. Gender, age, race/ethnicity, educational attainment, and childhood poverty were again controlled for in these analyses.

Characteristics of the Natural Mentoring Relationship

In order to address the second aim, a series of binary logistic regression models were again run for each outcome, but with a sub-sample of only those youth who identified a natural mentoring relationship (n=6,352). A separate binary logistic regression was run for each outcome; first all characteristics of the natural mentoring

relationship were included in the model (Model 1). Next, a model was run with only

those characteristics that were significant in Model 1. This was considered the baseline

model (Model 2). A third model was run that included each significant characteristic

from the baseline model, along with an interaction term with sexual orientation identity

(Model 3). If multiple characteristics were significant, each interaction term was added in

a separate model while still controlling for the other significant characteristics. All

models controlled for age, gender, race/ethnicity, childhood poverty, and educational

attainment.

Classes of Natural Mentoring Relationships

A sub-sample of only those youth with a natural mentor was used again in the

third aim, but included natural mentors who became important in young adulthood

(n=6,801). The current study ran a latent class analysis to identify sub-groups of natural

mentoring relationships based on five characteristics: stage of development at which the

mentor became important, the mentor's social role, longevity of the relationship,

frequency of contact, and perceived closeness. The mentor's functional roles were

initially included in the specification of the latent class analysis but the study found that

they were not good indicators of the latent class. In other words, they did not add to class

homogeneity or class separation, and they did not provide any substantive meaning.

Below, a detailed description of the latent class analysis statistical method is provided,

followed by the specific latent class analyses performed in the current study.

Detailed description of latent class analysis statistical method. Variable-centered

and person-centered approaches to data analysis provide different types of information

and can often be complimentary. Variable-centered approaches, such as regression,

primarily analyze data to discover whether one variable accounts for unique variance above and beyond another variable. One disadvantage of variable-centered approaches is that while there is the possibility to look at higher-order relationships (i.e., interactions), the power and interpretation can become difficult depending on the number of variables and order of interactions (Petrenko, Friend, Garrido, Taussig, & Culhane, 2012). Rather than controlling for individual variables to understand their unique contribution, a person-centered approach, such as latent class analysis (LCA), identifies patterns of experience *across* multiple categorical observed variables. Individuals are then classified into mutually exclusive categories in which they have the highest probability of membership based on their experience on observed variables (Petrenko et al., 2012).

In this way, LCA considers the complex and multidimensional nature of a construct such as natural mentoring relationships. Applying LCA to the current study allowed for exploration beyond the unique contribution of different characteristics of a natural mentoring relationship. LCA assumes that there is a relationship between these characteristics that can be explained by an underlying latent variable (Geiser, Lehmann, & Eid, 2006). Using LCA, the current study was able to first identify these distinctive subgroups of natural mentoring relationships, and then analyze the relationship between class membership and external variables, including demographic predictors of latent class membership and mental health and substance abuse outcomes.

LCA, introduced by Lazarfeld and Henry (1968), is quickly growing as an analytic technique in behavioral and psychological research (Bray, Lanza, & Tan, 2014). While researchers often use cluster analysis and factor analysis for latent variable modeling, LCA has some important differences and advantages over these two types of

analyses. In factor analysis, one uses continuous observed variables to identify a common

latent factor(s) that explains the inter-item correlations. In LCA, one uses categorical

observed variables to identify latent classes that explain differences in item-response

patterns. Each class shows a characteristic, class-specific response profile (Geiser, 2013).

Unlike cluster analysis, LCA is model-based; the number of classes is determined with fit

statistics and tests of significance. Furthermore, LCA assigns membership into a class

based on probabilities, and is therefore able to account for uncertainty of class

membership (i.e., measurement error) (Reinke, Herman, Petras, & Ialongo, 2008).
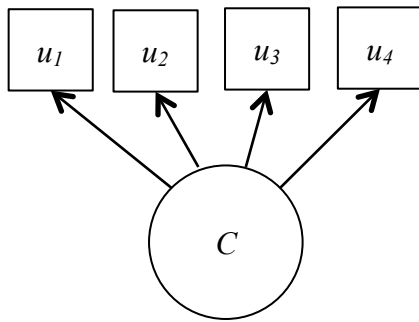
Figure 4: Basic latent class analysis model

Figure 4 provides an illustration of a basic LCA model. Figure 4 shows that the

latent class variable, *C*, is defined by the observed categorical variables, $u_1 - u_4$. An

important assumption of LCA, known as conditional independence, states that the

observed variables are conditionally independent within a class. In other words, when the

latent variable is held constant, individuals' responses to any two items are statistically

independent (Finch & Bronk, 2011). LCA is a probability-based approach with an overall

aim of determining the smallest number of classes that describe the association between

the observed variables. In LCA, two model parameters are estimated: class probabilities

and item-response probabilities. This can be seen in the following mathematical equation

for a basic LCA model with dichotomous variables:

$$p(X_{vi} = 1) = \sum_{g=1}^{G} \pi_g \, \pi_{ig}$$

In this equation, $p(X_{vi} = 1)$ is the unconditional probability that a randomly

selected individual v has a response of $X = 1$ on item i. The parameter π_g is the

unconditional probability of membership in latent class g (i.e., class size

probability/proportion). The parameter π_{ig} is the conditional probability of a response of 1

on item i given membership in class g (i.e., item-response probability) (Geiser, 2013). An

individual's estimated probability of membership in each class, as well as their most

likely class membership based on these probabilities, can then be obtained from the LCA

measurement model.

In exploratory LCA, researchers do not have a strong theory regarding the number

of classes that best fit the data. Therefore, the researcher must determine the number of

classes by running a series of LCA models with an increasing number of classes, and then

evaluating them using absolute and relative model fit statistics. Also considered when

estimating and evaluating a model is the quality of classification, as well as keeping in

mind the parsimony principle and interpretability. Although there is no single method for

model estimation and selection, there are several statistical criteria that can help guide

model evaluation.

The Akaike's information criterion (AIC) and the Bayesian information criterion

(BIC) are frequently used to compare models, with a lower value indicating a better

model fit. Nylund, Asparouhov, and Muthén (2007)found that among the information

criteria, the sample size adjusted BIC (aBIC) is the most accurate indicator of model fit.

The adjusted Lo-Mendell-Rubin likelihood ratio test (LMR-LRT) is also used to compare

models, with a significant *p*-value indicating that the current model fits the data better than a model with one less class.

Researchers often use chi-square goodness-of-fit statistics to test absolute fit of the model. The one preferred in LCA is the Likelihood Ratio (LR) chi-square test (χ^2_{LR}), also known as G^2, with the most optimal model having a non-significant *p*-value (Collins & Lanza, 2010). Unfortunately, the assumption under which these test statistics follow a chi-square distribution is often violated (Geiser et al., 2006). This is often the case when there is sparse data (i.e., there are many unobserved response patterns) (Geiser, 2013). Additionally, chi-square tests are known to be sensitive to Type I errors (i.e., incorrectly rejecting the null hypothesis) with large sample sizes. When the chi-square value cannot be relied on for determining goodness-of-fit, a close examination of the standardized residuals is recommended. Large values (i.e., > 3) that are more than 1-5% of the overall response patterns indicate a poor-fitting model (Masyn, 2013). Entropy is used as an indicator of the quality of classification for the sample across all latent classes, with values close to 1 indicating high classification accuracy. Entropy can be used to assess the utility of a model and to identify problematic over-extraction of classes, but it should never be used for model selection (Masyn, 2013).

Equally important to these statistics is the interpretability and theoretical meaning of the model. Models are usually easiest to interpret when there is both high homogeneity and class separation. Homogeneity occurs when there is a particular response category that typifies that class. In other words, high-class homogeneity is indicated when there are items with very high (>0.7) or very low (<0.3) conditional response probabilities (Masyn, 2013). High-class separation refers to the ability to distinguish between the

classes. It is possible to have high-class homogeneity and low-class separation. For example, the same item may have an item response probability of .08 in two different classes. That item characterizes the class well, but it does not distinguish between the classes (Masyn, 2013). Overall, a researcher must consider the simplicity, clarity, and utility of each model, ultimately deciding on which model best explains the phenomenon of interest.

Thus far we have discussed the basic LCA measurement model; the primary goal is to identify latent classes of a construct based on responses to categorical observed variables. There are several extensions to this model, most of which look at the relationship between latent class membership and auxiliary variables. This includes analyzing predictors (i.e., LCA with covariates, which is also known as latent class regression) and outcomes of class membership (i.e., LCA with distal outcomes).

Latent class regression can be used to gain a better understanding of the latent classes, as well as to test hypotheses regarding their relationship with other variables. Figure 5 provides an illustration of a general LCA model with covariates, using Vermunt's (2010) three-step method to estimate the model. In this method, the latent class model is estimated in a first step using only indicator variables. In the second step, the most likely class variable is created using posterior probabilities obtained from the first step (N). In the third step, the most likely class variable is used as a latent class indicator variable with uncertainty rates pre-fixed at the probabilities obtained in the second step (Asparouhov & Muthén, 2014a). The multinomial logistic regression of C on X is then estimated.
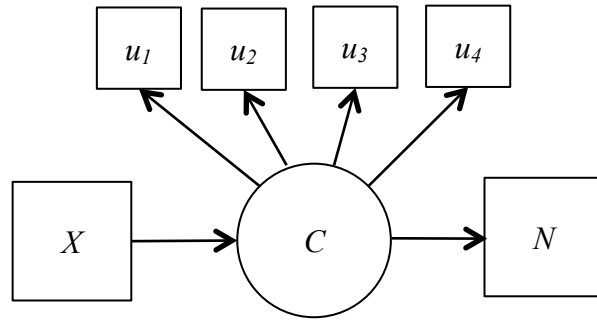
Figure 5: Three-step latent class regression

It is recommended that a researcher first build an unconditional LCA measurement model and then add the covariates once a final LCA model has been selected (Masyn, 2013). The three-step method (Vermunt, 2010) is preferred when conducting LCR so that the addition of the covariates does not affect the latent class formation. Furthermore, using the most likely class variable, with uncertainty rates pre-fixed at posterior probabilities, as an indicator of the latent class variable helps account for measurement error (i.e., misclassification) (Asparouhov & Muthén, 2014a).

As Lanza, Bray & Collins (2013) note, it is important to test for measurement invariance to ensure that the latent class model does not differ based on an individual's value on a covariate. Only then can one make meaningful comparisons between groups. One way to test for measurement invariance is to first evaluate a fully unconstrained LCA model with multiple groups, using the covariate as the grouping variable. In other words, while the same number of classes is chosen, both the class size and item-response probabilities are allowed to vary. Next, a semi-constrained LCA model with multiple groups is evaluated. Again using the same number of latent classes, in this model the class sizes are allowed to vary but the item-response probabilities are constrained to be equal across groups. The fit of the two models are compared and if the semi-constrained model does not fit worse, then one can assume measurement invariance. This is assessed

with the LR chi-square difference test ($p > .05$ indicates measurement equivalence) and the information criteria (Lanza et al., 2013).

More recent methodological work has focused on predicting outcomes from latent class membership. This is a prevalent topic in LCA methodological research because the classify-analyze approach that many researchers have traditionally used is problematic and may produce biased results (Bray et al., 2014). In the classify-analyze approach the researcher first classifies individuals into latent classes based on posterior probabilities, and then performs the subsequent analysis treating the latent class membership as known. Given that LCA is a probability-based model, this does not account for the classification error and may lead to attenuation in the final estimates.

Lanza, Tan, & Bray (2013) recently developed a model-based approach for distal outcomes, but it cannot handle more complex models that include covariates of the outcome and complex survey data. While the 3-step method proposed by Vermunt (2010) can handle more complex models, there can be a problematic shift in classes when the outcome variable is added in the third step. Most recently, the new BCH method has been proposed to correct for this class shifting (Asparouhov & Muthén, 2014b). However, this method can only currently be used with continuous outcome variables. Therefore, in many studies there is no alternative but to use the classify-analyze approach to assess the effect of latent class membership on outcomes.

There are two classify-analyze methods that researchers commonly use: 1) maximum-probability assignment, and 2) multiple pseudo-class draws. Both methods use posterior probabilities to assign individuals to a class and then treat that variable as known in subsequent analyses. However, the method in which they assign an individual

to a class differs (Bray et al., 2014). The maximum-probability assignment approach assigns individuals to the class that they have the highest posterior probability of membership. The multiple pseudo-class draw approach creates a latent class variable from multiple imputations using an individual's posterior probabilities, and then runs a chi-square test of equal proportions for categorical outcomes (Wang, Brown, & Bandeen-Roche, 2005).

Both of these techniques have advantages and disadvantages. The maximum-probability assignment approach is simple and straightforward, and allows for inclusion of control variables in the model. However, it does not account for classification error. The multiple pseudo-class draw method does help with the classification error, but was originally developed as a diagnostic tool and therefore, it is only a bivariate analysis. Most recently, Bray et al. (2014) proposed an alternative for helping to eliminate bias in classify-analyze approaches. They suggest using a more inclusive LCA model to generate posterior probabilities. In other words, they found that including all of the variables that will be present in the final analytic model as covariates when estimating the classification model significantly reduced bias. They show that, similar to the multiple imputation literature, accounting for the same variables in both models helps in reducing attenuation (Bray et al., 2014). Additionally, they found that maximum-probability assignment outperformed the multiple pseudo-class draw method in reducing bias (Bray et al., 2014).

Latent class analysis in the current study. As mentioned, the current study ran a latent class analysis to identify sub-groups of natural mentoring relationships based on five characteristics of the relationship: stage of development at which the mentor became important, the mentor's social role, longevity of the relationship, frequency of contact,

and perceived closeness. Following the guidelines of Masyn (2013), the study estimated

multiple latent class models, each with an increasing number of classes. The study used

500 sets of random starts with each model in order to have greater confidence that the

global maximum (instead of a local maximum) in the likelihood function was identified

(Geiser, 2013). Each model was evaluated based on several goodness-of-fit indices,

including the AIC and aBIC, the LR chi-square statistic, the adjusted LMR-LRT, and

standardized residuals. Entropy was also considered in terms of classification quality.

Finally, parsimony and substantive meaning were taken into account for each model.

Once the final unconditional model was selected, the study was able to interpret the

classes.

The study was then able to explore differences in characteristics of youth across

classes, including sexual orientation identity, gender, age, race/ethnicity, and educational

attainment. The study found that childhood poverty did not have a significant effect on

latent class membership and therefore, did not include it in this analysis. In order to do

this, the study first ran a multiple-group LCA for each categorical youth characteristic as

a known class. This provided both information on measurement invariance and the

prevalence of each latent class based on youth characteristics. Second, the study used the

three-step method (Vermunt, 2010) to examine youth characteristics as predictors of

latent class membership.

Finally, in order to test associations between latent class membership and mental

health and substance abuse outcomes, the study used inclusive LCA with a classify-

analyze technique: maximum-probability assignment. The Lanza et al. (2013) method

was not used because of the complex survey data, and Vermunt's (2010) three-step

approach was not used because there was a high rate of classification error when the distal outcome was added to the model (i.e., the latent class variable in step three had more than 20% classification error relative to the first step). Therefore, the maximum-probability assignment method was used with inclusive LCA to reduce bias. Each outcome was included as a covariate in a separate classification model. In this way, the current study was able to estimate separate sets of posterior probabilities that mirrored the variables included in the corresponding regression model. Each individual was assigned a class based on the one in which they had the highest posterior probability. The current study first ran bivariate analyses to estimate the prevalence of each mental health or substance abuse outcome across the five latent classes. A series of binary logistic regression models were then run for each outcome, controlling for gender, age, race/ethnicity, educational attainment, and poverty. Finally, the current study ran a series of binary regression models that included interaction terms between each latent class and sexual orientation.

Missing Data

In order to accurately identify the percentage of the data that was missing, as well as any missing data patterns, the current study ran a series of missing analyses for each aim. In other words, because the study samples and variables were different for Aim 1 then for Aims 2 and 3, a separate missing analysis was run for each. For Aim 1, the study found that 94% of the cases were complete on all variables included in the models. For Aim 2, the study found that 95% of the cases were complete on all variables. Given that there were less than 10% of incomplete cases due to unplanned missing data, the study chose not to perform multiple imputation. Additionally, no missing data patterns were

identified. Listwise deletion was used in STATA 13. All latent class analyses conducted

in MPlus 7.1 used full information maximum likelihood estimation under the assumption

that data was missing at random (Muthén & Muthén, 1998-2012).

CHAPTER IV: RESULTS

The current study first presents the univariate and bivariate descriptives. Second, the current study presents results from binary logistic regression analyses used to answer research questions related to the relationship between the presence of a natural mentor and mental health and substance abuse outcomes (i.e., Aim 1). This is followed by the results from binary logistic regression analyses used to answer research questions related to the unique associations between various characteristics of the natural mentoring relationship and mental health and substance abuse outcomes (i.e., Aim 2). Lastly, the current study provides results from the latent class analysis. This includes the identification and interpretation of sub-groups of natural mentoring relationships based on relationship characteristics, differences in youth characteristics across the latent classes, the relationship between latent class membership and mental health and substance abuse outcomes, and sexual orientation-based differences in these assocations (i.e., Aim 3).

Descriptives

Table 1 presents study demographics as a function of sexual orientation identity. As is shown in the table, there is a significant difference between sexual minority youth and heterosexual youth on all mental health and substance abuse indicators. Compared to heterosexual youth, sexual minority youth consistently have higher rates of poor mental health and substance abuse outcomes. The largest differences between sexual minority youth and heterosexual youth were found with depression, self esteem, life satisfaction, and marijuana use. Thirty percent of sexual minority youth, compared to 17% of heterosexual youth showed symptoms of being at least moderately depressed (F=67.42,

p<.001). Compared to heterosexual youth, a smaller percentage of sexual minority youth reported high self-esteem (40% versus 53%) and high life satisfaction (73% versus 85%) (*F*=50.43, *p*<.001 and *F*=68.75, *p*<.001, respectively). They were most dissimilar in their use of marijuana, where 37% of heterosexual youth used marijuana in the last year, compared to only 22% of heterosexual youth (*F*=91.63, *p*<.001).

There was no significant difference in the presence of a natural mentor between sexual minority youth and heterosexual youth (*F*=1.75, *p*>.05). However, there were significant differences between sexual minority youth and heterosexual youth in the characteristics of their natural mentoring relationship. For example, compared to heterosexual youth, sexual minority youth had significantly less frequent contact (*t*=5.66, *p*<.001), shorter relationships (*t*=2.62, *p*<.05), and lower perceived closeness (*t*=4.51, *p*<.001). A higher percentage of sexual minority youth's natural mentors were school mentors: 46% versus 31% for heterosexual youth, and a lower percentage were kin mentors: 40% versus 53% of heterosexual youth's natural mentors. (*F*=13.64, *p*<.001). While there was no significant difference between sexual minority youth and heterosexual youth in when their natural mentor became important, over half of all natural mentors became important in adolescence (57% for heterosexual youth, and 59% for sexual minority youth). For sexual minority youth, 26% of their natural mentors became important in childhood and 15% in young adulthood. Heterosexual youth had a higher percentage of natural mentors who became important in childhood (31%) and a lower percentage that became important in young adulthood (12%).

Emotional and instrumental support were the only two natural mentor functional roles that were significantly different for sexual minority youth versus heterosexual youth

(F=7.98, p<.01 and F=7.38, p<.01, respectively). Half of sexual minority youth had natural mentors who provided emotional support, compared to only 41% of heterosexual youth. Conversely, only six percent of sexual minority youth had a natural mentor who provided instrumental support, while 11% of heterosexual youth's natural mentors provided this support.

In terms of demographics, there was a significant difference in gender between sexual minorities and heterosexuals (F=184.13, p<.001). Seventy-one percent of sexual minority youth identified as female, compared to 47% of heterosexual youth. The current study ran a preliminary three-variable regression with each outcome in order to explore the effect of the high prevalence of females who identify as sexual minorities. As is shown in Table 2, a significant relationship between sexual orientation and each outcome remains after controlling for the effect of gender. Although not shown in the table, for several of the outcomes (i.e., self esteem, marijuana use, illicit drug use, binge drinking, and drinking-related problems), the odds ratio for sexual minority youth actually increased when gender was added to the model. This indicates that the effect of sexual orientation is being "clouded" by the fact that a higher percentage of women are sexual minorities. In other words, it shows that each of these outcomes is actually a larger problem for boys so that when we do not control for gender, sexual orientation has less of an effect.

There were also significant differences between sexual minority youth and heterosexual youth in terms of race/ethnicity, educational attainment, and childhood poverty (F=8.17, p<.001; F=5.97, p<.01; and F=6.71, p<.05, respectively). Compared to heterosexual youth, a higher percentage of sexual minority youth were non-Hispanic

White and a lower percentage were non-Hispanic Black. A higher percentage of sexual

minority youth had more than a high school diploma and had experienced childhood

poverty when compared to heterosexual youth. There were no significant differences in

age; the average age for both sexual minorities and heterosexuals was 22 years old.

Table 1
Descriptive Statistics for Participants (N=14,080) in the National Longitudinal Study of Adolescent Health (Wave III, 2001-2002), Stratified by Sexual Orientation

Variable	Heterosexual Youth (n=12,667)	Sexual Minority Youth (n=1,413)	F^a/t
	% / Mean (SD)		
Dependent Variables			
Depression (CESD)	17.43	30.33	67.42***
Suicide Ideation	5.59	16.53	48.19***
Self-Esteem (high)	52.58	39.55	50.43***
Life Satisfaction (high)	85.22	72.57	68.75***
Drug Use – Marijuana	21.80	36.76	91.63***
Drug Use – Other Illicit	6.54	13.83	68.58***
Binge Drinking	50.56	58.89	15.42***
Drinking-Related Problems	25.48	36.41	36.01***
Moderator			
Natural Mentor Presence	46.57	43.85	1.75
Characteristics of Natural Mentoring Relationship[b]			
Relationship Longevity (2-27 yrs)	10.71 (6.91)	9.75 (6.94)	2.62*
Freq. of In-Person Contact (0-7)	3.67 (2.13)	2.95 (2.16)	5.96***
Freq. of Virtual Contact (0-7)	3.52 (2.45)	2.92 (2.47)	4.44***
Freq. of Contact (0-14)	7.19 (4.12)	5.88 (4.19)	5.66***
Perceived Closeness (0-5)	2.59 (1.28)	2.26 (1.40)	4.51***
Social Role			13.64***
Kin	53.25	39.88	
School	30.48	45.51	
Community	16.26	16.61	
Functional Role			
Advice	58.99	54.85	1.73

Emotional	41.14	49.59	7.98**
Instrumental	10.52	6.14	7.38**
Parental	5.36	5.64	0.05
Friend	4.95	5.08	0.01
Role Model	15.02	15.98	0.20
Stage of Development[c]			2.50
Childhood	30.84	26.23	
Adolescence	57.46	59.13	
Young Adulthood	11.70	14.63	
Control Variables			
Age (18-28 years)	21.82 (1.87)	21.74 (1.83)	0.95
Race/Ethnicity			8.17***
Non-Hispanic White	65.17	71.18	
Non-Hispanic Black	15.86	8.54	
Hispanic	11.68	11.75	
Other[d]	7.29	8.53	
Gender (Female)	46.50	71.30	184.13***
Educational Attainment			5.97**
< High School	14.23	14.52	
High School Diploma/GED	33.33	27.22	
> High School	52.44	58.24	
Childhood Poverty	15.31	19.27	6.71*

p<.05; **p*<.01; ***p*<.001; all analyses adjusted for complex survey design. All variables measured at Wave III unless otherwise noted.
[a] Adjusted Pearson chi-square statistic was used to correct for the survey design, and is converted into an *F* statistic.
[b] Characteristics of mentoring relationship use only those respondents with a natural mentor who is currently living (n=6,352; heterosexual youth n=5752 & sexual minority youth n=600).
[c] Given that stage of development includes young adulthood, these percentages are out of all youth with natural mentors (n=6801).
[d] Other includes those who identified as Asian, Native American, Multi-Racial, and Other.

Table 2
Preliminary Three-Variable Regressions Checking the Effect of Gender

Outcome	Model 1 (controlling for gender)
	OR (95% C.I.)
Depression	
SMY	1.89 (1.62, 2.21)***
Female	1.45 (1.29, 1.62)***

Suicide Ideation	
SMY	3.38 (2.71, 4.22)***
Female	0.96 (0.78, 1.18)
Self-Esteem	
SMY	0.62 (0.53, 0.71)***
Female	0.84 (0.53, 0.71)***
Life Satisfaction	
SMY	0.45 (0.37, 0.55)***
Female	1.08 (0.95, 1.22)
Marijuana Use	
SMY	2.50 (2.12, 2.95)***
Female	0.51 (0.45, 0.58)***
Illicit Drug Use	
SMY	2.83 (2.29, 3.50)***
Female	0.46 (0.38, 0.55)***
Binge Drinking	
SMY	1.68 (1.39, 2.03)***
Female	0.51 (0.45, 0.56)***
Drinking-Related Problems	
SMY	2.00 (1.67, 2.41)***
Female	0.52 (0.47, 0.58)***

*$p<.05$; **$p<.01$; ***$p<.001$; all analyses adjusted for complex survey design.

Presence of a Natural Mentor

To examine the relationship between the presence of a natural mentor and mental health and substance abuse outcomes for sexual minority and heterosexual youth, the current study ran a series of binary logistic regressions. Table 3 presents the results from both the main effects and interaction effect models (Models 1 and 2, respectively). All results are presented as odds ratios (O.R.). Transforming the regression coefficients to odds ratios (e^b) eases interpretation of the results. As an example, a ratio of one represents equal odds that sexual minority and heterosexual youth experience depression. A ratio greater than one represents increased odds that sexual minority youth experience depression in comparison to heterosexual youth, while a ratio less than one represents decreased odds.

For all outcomes, the main effect of sexual orientation identity was statistically significant when controlling for the presence of a natural mentor, age, gender, race/ethnicity, childhood poverty, and educational attainment. In comparison to heterosexual youth, sexual minority youth had significantly higher odds of exhibiting depression, suicide ideation, marijuana use, illicit drug use, binge drinking, and drinking-related problems. In comparison to heterosexual youth, sexual minority youth had lower odds of having high self-esteem and life-satisfaction. For most of these outcomes, sexual orientation identity had a strong effect. Compared to heterosexual youth, identifying as a sexual minority youth increased the odds of experiencing depression by a factor of 1.95 ($p<.001$), suicide ideation by a factor of 3.20 ($p<.001$), using marijuana by a factor of 2.42 ($p<.001$) and illicit drugs by a factor of 2.67 ($p<.001$), binge drinking by a factor of 1.52 ($p<.001$), and experiencing drinking-related problems by a factor of 1.95 ($p<.001$). Identifying as a sexual minority decreased the odds of having high self-esteem or life satisfaction by 35% and 56%, respectively ($p<.001$).

The main effect of the presence of a natural mentor was statistically significant for four outcomes: self-esteem, life satisfaction, binge drinking and drinking-related problems. In comparison to those without a natural mentor, those with a natural mentor had higher odds of high self-esteem (O.R.=1.12, $p<.05$) and life satisfaction (O.R.=1.17, $p<.05$). Interestingly, those with a natural mentor had higher odds of experiencing binge drinking (O.R.=1.18, $p<.001$) and drinking-related problems (O.R.=1.19, $p<.01$).

There were no significant interactions between sexual orientation identity and the presence of a natural mentor. In other words, the relationship between sexual orientation identity and the mental health and substance abuse outcomes remained the same

regardless of whether or not a young adult had a natural mentor in adolescence.

Table 3

Disparities in MH/SA outcomes between SMY and non-SMY (ages 18-26), and the role of NMR Among Participants (N=14,080) in the National Longitudinal Study of Adolescent Health (Wave III, 2001-2002)

Outcome	Model 1 (main effects only)	Model 2 (with interaction)
	Adjusted OR[a] (95% C.I.)	
Depression		
SMY	1.95 (1.68, 2.27)***	2.16 (1.72, 2.70)***
NMR	0.93 (0.82, 1.05)	0.96 (0.84, 1.09)
SMYxNMR	--	0.79 (0.54, 1.16)
Constant	0.17 (0.15, 0.20)***	0.17 (0.15, 0.20)***
Suicide Ideation		
SMY	3.20 (2.56, 4.02)***	3.72 (2.75, 5.04)***
NMR	0.93 (0.77, 1.12)	1.00 (0.82, 1.23)
SMYxNMR	--	0.71 (0.44, 1.12)
Constant	0.06 (0.05, 0.08)***	0.06 (0.05, 0.08)***
Self-Esteem		
SMY	0.65 (0.56, 0.75)***	0.61 (0.51, 0.73)***
NMR	1.12 (1.01, 1.24)*	1.11 (0.99, 1.23)
SMYxNMR	--	1.14 (0.87, 1.50)
Constant	1.01 (0.89, 1.15)	1.01 (0.90, 1.16)
Life Satisfaction		
SMY	0.44 (0.36, 0.54)***	0.46 (0.35, 0.59)***
NMR	1.17 (1.04, 1.33)*	1.18 (1.04, 1.35)*
SMYxNMR	--	0.94 (0.64, 1.35)
Constant	5.58 (4.82, 6.46)*	5.56 (4.79, 6.45)
Marijuana Use		
SMY	2.42 (2.06, 2.56)***	2.23 (1.77, 2.81)***
NMR	0.97 (0.86, 1.10)	0.95 (0.83, 1.09)
SMYxNMR	--	1.21 (0.86, 1.69)
Constant	0.37 (0.32, 0.43)***	0.37 (0.32, 0.43)***
Illicit Drug Use		
SMY	2.67 (2.14, 3.33)***	2.20 (1.65, 2.94)***
NMR	0.94 (0.79, 1.13)	0.88 (0.72, 1.06)
SMYxNMR	--	1.51 (0.94, 2.41)
Constant	0.11 (0.09, 0.14)***	0.12 (0.09, 0.14)***
Binge Drinking		
SMY	1.52 (1.26, 1.83)***	1.45 (1.13, 1.86)**
NMR	1.18 (1.08, 1.29)***	1.17 (1.06, 1.28)**

SMYxNMR	--	1.12 (0.79, 1.58)
Constant	1.63 (1.42, 1.87)***	1.64 (1.43, 1.88)***
Drinking-Related Problems		
SMY	1.95 (1.62, 2.34)***	1.88 (1.45, 2.43)***
NMR	1.19 (1.07, 1.32)**	1.18 (1.05, 1.32)**
SMYxNMR	--	1.08 (0.76, 1.54)
Constant	0.44 (0.38, 0.50)***	0.44 (0.39, 0.51)***

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design; MH=mental health, SA=substance abuse, SMY=sexual minority youth, NMR=natural mentor relationship.
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.

Characteristics of the Natural Mentoring Relationship

As explained in the methods section, the current study ran a series of binary logistic regression models for each outcome. Model 1 includes all characteristics of the natural mentoring relationship. Model 2, the baseline model, includes only those characteristics that were significant in Model 1. Model 3 tests whether the relationship between sexual orientation and each outcome varies based on characteristics of the natural mentoring relationship by adding an interaction term for each significant characteristic in Model 2. If multiple characteristics were significant, each interaction term was added in a separate model while still controlling for the other significant characteristics. All models controlled for age, gender, race/ethnicity, childhood poverty, and educational attainment.

Overall, the main effect of sexual orientation for all mental health and substance abuse outcomes remained statistically significant when characteristics of the natural mentoring relationship were added to the model. In comparison to heterosexual youth, sexual minority youth had significantly higher odds of exhibiting depression, suicide ideation, marijuana use, illicit drug use, binge drinking, and drinking-related problems. They had lower odds of having high self-esteem and life-satisfaction. The remainder of

this section presents the results of the associations between the characteristics of the

natural mentoring relationship and the mental health and substance abuse outcomes,

separated by each outcome.

Depression

Table 4 shows that perceived closeness was the only characteristic of the natural

mentoring relationship that was significantly related to depression. As perceived

closeness increased, the odds of experiencing depression decreased by 13% (O.R.=0.87,

p<.001). The current study found no significant interaction between perceived closeness

and sexual orientation.

Table 4
Role of characteristics of NMRs in reducing disparities in depression between SMY and non-SMY (ages 18-26)

	Model 1	Model 2 (baseline)	Model 3 (interaction effects)
	Adjusted O.R.[a] (95% C.I.)		
SMY	**1.67 (1.26, 2.23)****	**1.66 (1.25, 2.21)****	**1.90 (1.10, 3.26)***
Longevity	1.00 (0.98, 1.02)	--	--
Contact	1.02 (0.98, 1.05)	--	--
Closeness	**0.83 (0.74, 0.93)****	**0.87 (0.81, 0.94)*****	**0.88 (0.81, 0.98)****
Closeness x SMY	--	--	0.94 (0.77, 1.15)
School v. Kin[b]	1.02 (0.70, 1.49)	--	--
Community v. Kin[b]	1.03 (0.75, 1.43)	--	--
Community v. School[b]	N.S.	--	--
Advice	0.87 (0.70, 1.08)	--	--
Emotional	1.09 (0.89, 1.35)	--	--
Instrumental	1.18 (0.88, 1.58)	--	**--**
Parental	1.02 (0.66, 1.56)	--	--
Friend	0.85 (0.53, 1.34)	--	--
Role Model	0.76 (0.57, 1.01)	--	--
Constant	0.24 (0.16,0.37)***	0.55 (0.35, 0.85)**	0.54 (0.34, 0.84)**

*p<.05; ***p*<.01; ****p*<.001; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Suicide Ideation

Similar to depression, perceived closeness was the only characteristic of the natural mentoring relationship that was significantly related to suicide ideation (Table 5). As perceived closeness increased, the odds of experiencing suicide ideation decreased by 12% (O.R.=0.88, $p<.05$). The current study found no significant interaction between perceived closeness and sexual orientation.

Table 5
Role of characteristics of NMRs in reducing disparities in suicide ideation between SMY and non-SMY (ages 18-26)

	Model 1	Model 2 (baseline)	Model 3 (interaction effects)
	Adjusted O.R.[a] (95% C.I.)		
SMY	**2.62 (1.80, 3.82)*****	**2.61 (1.80, 3.79)*****	**2.38 (1.23, 4.61)***
Longevity	0.99 (0.96, 1.02)	--	--
Contact	1.05 (0.99, 1.12)	--	--
Closeness	**0.83 (0.69, 0.99)***	**0.88 (0.78, 0.99)***	**0.87 (0.76, 0.99)***
Closeness x SMY	--	--	1.04 (0.83, 1.31)
School v. Kin[b]	1.24 (0.70, 2.22)	--	--
Community v. Kin[b]	0.93 (0.52, 1.65)	--	--
Community v. School[b]	N.S.	--	--
Advice	1.06 (0.77, 1.47)	--	--
Emotional	1.13 (0.82, 1.56)	--	--
Instrumental	1.06 (0.60, 1.87)	--	**--**
Parental	1.00 (0.46, 2.19)	--	--
Friend	1.30 (0.65, 2.57)	--	--
Role Model	1.10 (0.70, 1.73)	--	--
Constant	0.06 (0.03, 0.14)***	0.09 (0.06, 0.14)***	0.09 (0.06, 0.14)

*$p<.05$; **$p<.01$; ***$p<.001$; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Self-Esteem

As is shown in Table 6, perceived closeness was again significantly related to self-esteem. As perceived closeness increased, the odds of experiencing high self-esteem increased (O.R.=1.14, *p*<.001). The current study found no significant interaction between perceived closeness and sexual orientation. Also significant was the association between having a mentor who provided instrumental support and self-esteem. Those who had a mentor who provided instrumental support, versus not providing this type of support, had lower odds of having high self-esteem (O.R.=0.68, *p*<.001). We found no significant interaction between instrumental support and sexual orientation.

Table 6
Role of characteristics of NMRs in reducing disparities in self-esteem between SMY and non-SMY (ages 18-26)

	Model 1	Model 2 (baseline)	Model 3 (interaction - closeness)	Model 4 (interaction - instrumental)
	Adjusted O.R.[a] (95% C.I.)			
SMY	0.66 (0.52, 0.83)**	0.67 (0.53, 0.84)**	0.60 (0.38, 0.95)*	0.68 (0.53, 0.87)**
Longevity	1.01 (0.99, 1.02)	--	--	--
Contact	0.98 (0.95, 1.01)	--	--	--
Closeness	1.18 (1.08, 1.30)**	1.14 (1.07, 1.21)***	1.14 (1.07, 1.21)***	1.14 (1.08, 1.21)***
Clsoeness x SMY	--	--	1.05 (0.88, 1.25)	--
School v. Kin[b]	1.09 (0.86 1.40)	--	--	--
Community v. Kin[b]	1.08 (0.83, 1.40)	--	--	--
Community v. School[b]	N.S.	--	--	--
Advice	1.11 (0.94, 1.30)	--	--	--
Emotional	1.05 (0.88, 1.24)	--	--	--
Instrumental	0.71 (0.57, 0.89)**	0.68 (0.55, 0.84)***	0.68 (0.54, 0.84)***	0.68 (0.54, 0.86)**
Instrumental x SMY	--	--	--	0.80 (0.35, 1.83)
Parental	1.13	--	--	--

	(0.82, 1.55)			
Friend	0.89	--	--	--
	(0.65, 1.21)			
Role Model	1.21	--	--	--
	(0.97, 1.52)			
Constant	0.76	0.87	0.88	0.87
	(0.52, 1.11)	(0.69, 1.11)	(0.69, 1.13)	(0.68, 1.10)

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Life Satisfaction

Similarly to depression, suicide ideation and self-esteem, perceived closeness was significantly related to life satisfaction (Table 7). As perceived closeness increased, the odds of experiencing life-satisfaction increased by a factor of 1.18 (p<.001). We found no significant interaction between perceived closeness and sexual orientation.

Table 7
Role of characteristics of NMRs in reducing disparities in life satisfaction between SMY and non-SMY (ages 18-26)

	Model 1 (main effects)	Model 2 (baseline)	Model 3 (interaction effects)
	Adjusted O.R.[a] (95% C.I.)		
SMY	**0.40 (0.29,0.55)***	**0.41 (0.30, 0.56)***	**0.47 (0.27, 0.83)**
Longevity	1.00 (0.98, 1.01)	--	--
Contact	0.99 (0.96, 1.03)	--	--
Closeness	**1.26 (1.12,1.42)***	**1.18 (1.09, 1.28)***	**1.19 (1.09, 1.30)***
Closeness x SMY	--	--	0.94 (0.77, 1.15)
School v. Kin[b]	1.09 (0.77, 1.56)	--	--
Community v. Kin[b]	1.14 (0.82, 1.59)	--	--
Community v. School[b]	N.S.	--	--
Advice	1.17 (0.91, 1.51)	--	--
Emotional	1.05 (0.84, 1.31)	--	--
Instrumental	0.74 (0.54, 1.02)	--	--
Parental	0.90 (0.56, 1.44)	--	--
Friend	0.84 (0.54, 1.31)	--	--
Role Model	1.26 (0.93, 1.71)	--	--
Constant	3.45(2.21,5.38)***	4.41 (3.25, 5.98)***	4.30 (3.12, 5.94)***

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR

(N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Marijuana Use

Table 8 shows that having a mentor who provided instrumental support was

significantly related to marijuana use. Those who had a mentor who provided

instrumental support, versus not providing this type of support, had higher odds of using

marijuana in young adulthood (O.R.=1.52, $p<.01$). We found no significant interaction

between instrumental support and sexual orientation.

Table 8
Role of characteristics of NMRs in reducing disparities in marijuana use between SMY and non-SMY (ages 18-26)

	Model 1 (main effects)	Model 2 (baseline)	Model 3 (interaction effects)
	Adjusted OR[a] (CI)		
SMY	**2.67 (2.05, 3.48)*****	**2.84 (2.23, 3.61)*****	**2.72 (2.12, 3.49)*****
Longevity	1.01 (0.99, 1.03)	--	--
Contact	1.00 (0.97, 1.04)	--	--
Closeness	0.02 (0.83, 1.02)	**--**	**--**
School v. Kin[b]	1.03 (0.78, 1.36)	--	--
Community v. Kin[b]	1.06 (0.78, 1.45)	--	--
Community v. School[b]	N.S.	--	--
Advice	1.11 (0.93, 1.34)	--	--
Emotional	1.09 (0.89, 1.34)	--	--
Instrumental	**1.63 (1.22, 2.18)****	**1.52 (1.15, 2.02)****	**1.45 (1.09, 1.94)***
Instrumental x SMY	--	--	1.87 (0.85, 4.11)
Parental	1.07 (0.74, 1.55)	--	--
Friend	0.80 (0.50, 1.28)	--	--
Role Model	1.14 (0.86, 1.51)	--	--
Constant	0.36 (0.24,0.54)***	0.34 (0.27, 0.44)***	0.35 (0.27, 0.44)***

*$p<.05$; **$p<.01$; ***$p<.001$; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Illicit Drug Use

Similarly to marijuana use, having a mentor who provided instrumental support was significantly related to illicit drug use (Table 9). Those who had a mentor who provided instrumental support had 76% higher odds of using illicit drugs in young adulthood, compared to those with mentors who did not provide this type of support (O.R.=1.76, *p*<.05). We found no significant interaction between instrumental support and sexual orientation.

Table 9
Role of characteristics of NMRs in reducing disparities in illicit drug use between SMY and non-SMY (ages 18-26)

	Model 1 (main effects)	Model 2 (baseline)	Model 3 (interaction effects)
	Adjusted O.R.[a] (95% C.I.)		
SMY	**3.65 (2.54,5.24)***	**3.41 (5.42, 4.78)***	**3.27 (2.28, 4.68)***
Longevity	1.00 (0.96, 1.03)	--	--
Contact	0.97 (0.92, 1.03)	--	--
Closeness	1.05 (0.87, 1.27)	--	--
School v. Kin[b]	0.69 (0.40, 1.20)	--	--
Community v. Kin[b]	0.91 (0.53, 1.58)	--	--
Community v. School[b]	N.S.	--	--
Advice	1.01 (0.73, 1.40)	--	--
Emotional	1.21 (0.84, 1.73)	--	--
Instrumental	**1.93 (1.23, 3.03)***	**1.76 (1.12, 2.78)***	**1.65 (1.00, 2.75)***
Instrumental x SMY	--	--	1.71 (0.60, 4.83)
Parental	1.76 (0.93, 3.33)	--	--
Friend	0.66 (0.29, 1.53)	--	--
Role Model	1.40 (0.91, 2.16)	--	--
Constant	0.09 (0.04,0.18)***	0.08 (0.06, 0.11)***	0.08 (0.06, 0.11)***

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Binge Drinking

As is shown in Table 10, there were multiple significant associations between relationship characteristics and binge drinking, including frequency of contact, perceived

closeness, and having a mentor who provided parental or friend support. As contact

increased, the odds of binge drinking increased by 3% (O.R.=1.03, p<.01). Conversely,

as perceived closeness increased, the odds of binge drinking decreased by 9%

(O.R.=0.91, p<.05). Compared to those who did not provide this type of support, those

young adults who had a mentor who provided parental support had higher odds of binge

drinking, while those who had a mentor who provided friendship support had lower odds

of binge drinking (O.R.=1.45, *p*<.05 and O.R.=0.58, *p*<.01, respectively). The study

found no significant interactions between these four characteristics of natural mentoring

relationships and sexual orientation (Table 11).

Table 10
Role of characteristics of NMRs in reducing disparities in binge drinking between SMY and non-SMY (ages 18-26)

	Model 1 (main effects)	Model 2 (baseline)
	Adjusted O.R.[a] (95 % C.I.)	
SMY	**1.61 (1.21, 2.12)****	**1.60 (1.21, 2.12)****
Longevity	1.00 (0.98, 1.01)	--
Contact	**1.04 (1.01, 1.06)****	**1.03 (1.01, 1.06)****
Closeness	**0.89 (0.82, 0.98)***	**0.91 (0.83, 0.98)***
School v. Kin[b]	0.99 (0.76, 1.29)	--
Community v. Kin[b]	0.84 (0.63, 1.11)	--
Community v. School[b]	N.S.	--
Advice	0.08 (0.92, 1.27)	--
Emotional	1.06 (0.89, 1.26)	--
Instrumental	1.16 (0.87, 1.53)	--
Parental	**1.56 (1.10, 2.21)***	**1.45 (1.03, 2.06)***
Friend	**0.60 (0.42, 0.87)****	**0.58 (0.40, 0.84)****
Friend x SMY	--	--
Role Model	1.22 (0.99, 1.52)	--
Constant	1.90 (1.33, 2.72)**	1.99 (1.57, 2.53)***

p<.05; **p*<.01; ***p*<.001; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Table 11

Interaction effects of characteristics of NMRs in reducing disparities in binge drinking between SMY and non-SMY (ages 18-26)

	Model 3 (interaction - contact)	Model 4 (interaction - closeness)	Model 5 (interaction - parental)	Model 6 (interaction – friend)
	Adjusted O.R.[a] (95% C.I.)			
SMY	1.67 (1.05, 2.68)*	2.08 (1.21, 3.59)**	1.65 (1.23, 2.20)**	1.54 (1.16, 2.05)**
Contact	1.03 (1.01, 1.06)**	1.03 (1.01, 1.06)**	1.03 (1.01, 1.06)**	1.03 (1.01, 1.06)**
Close	0.91 (0.84, 0.98)*	0.92 (0.85, 0.99)*	0.91 (0.83, 0.98)*	0.91 (0.83, 0.98)*
Parental	1.45 (1.03, 2.06)*	1.46 (1.03, 2.06)*	1.52 (1.07, 2.17)*	1.44 (1.02, 2.05)*
Friend	0.58 (0.40, 0.84)**	0.58 (0.40, 0.84)**	0.58 (0.40, 0.84)**	0.54 (0.37, 0.80)**
Contact x SMY	0.99 (0.93, 1.06)	--	--	--
Close x SMY	--	0.89 (0.73, 1.09)	--	--
Parental x SMY	--	--	0.62 (0.22, 1.75)	--
Friend x SMY	--	--	--	2.12 (0.63, 7.12)
Constant	1.98 (1.56, 2.52)***	1.94 (1.52, 2.46)***	1.99 (1.57, 2.53)***	2.00 (1.56, 2.54)***

*$p<.05$; **$p<.01$; ***$p<.001$; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.

Drinking-Related Problems

As shown in Table 12, both perceived closeness and emotional support had a significant association with drinking-related problems when all characteristics of the natural mentoring relationship were included in the model. However, in our baseline model these two characteristics were no longer significant. Therefore, the current study did not include perceived closeness or emotional support in the interaction models.

Having a mentor who provided instrumental support was significantly related to drinking-related problems. Those who had a mentor who provided instrumental support, versus not providing this type of support, had 45% higher odds of experiencing drinking related-problems in young adulthood (O.R.=1.45, $p<.01$). The current study found no significant interaction between instrumental support and sexual orientation.

Although a contrasting relationship, there was also a significant relationship between having a mentor who provided friendship support and drinking-related problems. Those young adults who had a mentor who provided friendship support had lower odds of exhibiting drinking-related problems compared to those with mentors who did not provide friendship support (O.R.=0.59, $p<.05$). The current study found no significant interaction between friendship support and sexual orientation.

Table 12
Role of characteristics of NMRs in reducing disparities in drinking related problems between SMY and non-SMY (ages 18-26)

	Model 1 (main effects)	Model 2 (baseline)	Model 3 (interaction - instrumental)	Model 4 (interaction – friend)
	Adjusted O.R.[a] (95% C.I.)			
SMY	**2.16 (1.66, 2.82)***	2.11 (1.62, 2.76)***	2.19 (1.65, 2.91)***	2.13 (1.64, 2.78)***
Longevity	1.00 (0.99, 1.02)	--	--	--
Contact	1.03 (0.99, 1.06)	--	--	--
Closeness	**0.85 (0.77, 0.94)**	0.93 (0.87, 1.00)	--	--
School v. Kin[b]	0.91 (0.67, 1.24)	--	--	--
Community v. Kin[b]	0.92 (0.69, 1.24)	--	--	--
Community v. School[b]	N.S.	--	--	--
Advice	1.13 (0.95, 1.36)	--	--	--
Emotional	**1.22**	1.14	--	--

	(1.00, 1.49)*	(0.95, 1.38)		
Instrumental	1.47 (1.12, 1.92)**	1.45 (1.10, 1.90)**	1.43 (1.08, 1.90)*	1.42 (1.08, 1.86)*
Instrumental x SMY	--	--	0.87 (0.38, 1.90)	--
Parental	1.31 (0.90, 1.90)	--	--	--
Friend	0.61 (0.40, 0.92)*	0.59 (0.39, 0.89)*	0.57 (0.38, 0.87)***	0.55 (0.35, 0.85)**
Friend x SMY	--	--	--	1.46 (0.53, 4.07)
Role Model	1.14 (0.89, 1.45)	--	--	--
Constant	0.52 (0.37, 0.75)***	0.55 (0.42, 0.70)***	0.49 (0.70, 0.59)***	0.49 (0.40, 0.60)***

*$p<.05$; **$p<.01$; ***$p<.001$; all analyses adjusted for complex survey design; SMY=sexual minority youth, NMR=natural mentor relationship. Analyses include only those participants with valid NMR (N=6,352).
[a] All analyses adjusted for age, gender, race/ethnicity, childhood poverty, and educational attainment.
[b] Reference Category

Classes of Natural Mentoring Relationships

The current study had four main goals in conducting a latent class analysis: 1) to identify and describe underlying classes of natural mentoring relationships among young adults; 2) explore differences in youth characteristics across classes; 3) examine associations between latent class membership and mental health and substance abuse outcomes, and 4) explore potential sexual orientation-based differences in these associations. This section presents the results of the latent class analysis, drawing attention to these goals.

Model Specification

Models with two through six latent classes were compared (the model with seven latent classes was not well identified) to find the best-fitting model. Table 13 shows both absolute and relative fit indices for each of these models. All models had significant chi-square test statistics ($p<.05$), suggesting that these models may not adequately capture the

heterogeneity of subgroups of natural mentoring relationships in the population.

However, as mentioned previously, chi-square tests are often sensitive to Type I errors

with large sample sizes. Given the large sample size in the current study, chi-square

cannot be relied on for determining goodness-of-fit. Instead, the current study examined

the standardized residuals of each model and found that the five-class and six-class

models were the only ones with less than 1-5% of standardized residual values greater

than three.

Table 13 also shows the AIC and aBIC as relative fit-indices. Both the AIC and

aBIC continue to decline with each subsequent increase in the number of classes.

However, this decline is greatly reduced between the five-class (AIC=41301.399;

aBIC=41443.634) and six-class models (AIC=41248.899; aBIC=41420.311), suggesting

that the six-class solution does not add much to the optimal fit of the model. Still, the

LMR-LRT is statistically significant in the six-class solution (LMR-LRT=23927.744,

p=.05).

Table 13
Model fit indices for exploratory latent class analysis of natural mentoring relationships among a subsample of youth with mentors (n=6801) from Wave III of the National Longitudinal Study of Adolescent Health (2001-2002)

	Number of Latent Classes				
	2-class	3-class	4-class	**5-class**	6-class
Pearson χ^2	875.741*	497.322*	286.549*	**83.361***	48.839*
LR χ^2	163.079*	306.896*	186.883*	**90.788***	51.438*
df	56	48	40	**32**	24
npar	15	23	31	**39**	47
LL	-21865.424	-21000.300	-20788.169	**-20611.699**	-20577.450
AIC	43760.847	42046.600	41638.339	**41301.399**	41248.899
aBIC	43815.553	42130.483	41751.398	**41443.634**	41420.311
Δ aBIC	--	1685.07	379.085	**307.764**	23.323
LMR-LRT	40503.183*	27015.640*	24774.880*	**24458.475***	23927.744*
Entropy	0.929	0.859	0.813	**0.774**	0.822

*p<.05
NOTE: LR χ^2 = likelihood ratio chi-square; *df* = degrees of freedom; *LL* = log likelihood; *npar* = number of parameters; AIC = Akaike Information Criterion; aBIC = Bayesian Information Criterion (adjusted); LMR-LRT = Lo-Mendell-Rubin likelihood ratio test (adjusted).

After careful examination of the four-class, five-class, and six-class solutions, the current study selected the five-class model. This model had a significant drop in the chi-square values, AIC, and aBIC from the four-class solution, less than 1% of the standardized residuals were greater than three, it was more parsimonious than the six-class solution, and the parameter estimates created a solution that had more substantive interpretability. Although not used in model selection, the entropy value and classification table (Table 14) provided evidence that in the five-class model the sample was well classified.

Table 14
Classification Table: Average latent class probabilities for most likely latent class membership (row) by latent class (column)

	1	2	3	4	5
1	**0.878**	0.074	0.000	0.005	0.043
2	0.090	**0.784**	0.000	0.000	0.126
3	0.001	0.000	**0.910**	0.063	0.027
4	0.047	0.000	0.206	**0.730**	0.016
5	0.024	0.059	0.010	0.000	**0.905**

Model Interpretation

Each latent class represents a subgroup of young adults who have similar natural mentoring relationships, which are based on their responses to questions about five characteristics of the relationship. The parameter estimates presented in Table 15 are the item-response probabilities for each item within a class. Also provided in Table 15 are the class probabilities (i.e., class size). This table, along with Figure 6, aid in interpretation and labeling of the five classes. Additionally, to ease interpretation, the current study categorized the five characteristics into type (i.e., social role: family, school, or community), time (i.e., stage of development: childhood, adolescence, or young adulthood), and quality (i.e., length of the relationship, perceived closeness, and frequency of contact).

Those in the first latent class had high probabilities of having a school mentor (0.760), high probabilities of the relationship beginning in adolescence (0.915), and low probabilities of experiencing above average length (0.050), closeness (0.026), and contact (0.032). The current study labeled this class of natural mentoring relationships *Past School Mentors*. This was the largest class, which represented 37% of the youth.

Those in the second class had high probabilities of having a community mentor (0.763). Two-thirds of the relationships in this class began in young adulthood (0.634) and one-third began in adolescence (0.364). Those in the second class had low probabilities of experiencing above average length (0.000) and closeness (0.127). They had moderate probabilities in having above average contact with their mentor (0.470). The current study labeled this class, representing 12% of the youth, *Newfound Community Mentors.*

The youth in the classes three, four and five all had high probabilities of having a family mentor: 0.965, 0.693, and 0.709, respectively. There were, however, distinct differences in the timing and quality of those family relationships. Those in the third latent class had high probabilities of the relationship beginning in childhood (0.832), and high probabilities of experiencing above average length (0.988), closeness (0.693), and contact (0.741). The current study labeled this class of natural mentoring relationships *Permanent Family Mentors*. This was the second largest class, which represented 26% of the youth.

Those in the fourth class also had high probabilities of the relationship beginning in childhood (0.790) and having above average length (1.000); however, they had low probabilities of experiencing above average closeness (0.035) and contact (0.762). The

fourth class was the smallest class, representing 10% of the youth. The current study

labeled this class of natural mentoring relationships *Distant Family Mentors.*

Finally, those in the fifth class had high probabilities of their relationship

beginning in adolescence (0.939). In terms of quality, those in this class had low

probabilities of experiencing above average length (0.063), moderate probabilities of

experiencing above average closeness (0.560), and high probabilities of experiencing

above average contact (0.762). The current study labeled this class of natural mentoring

relationships *Recently-Engaged Family Mentors*. They represented 14% of the youth.

Table 15
*Items and item-response probabilities^a for final unconditional model (five-classes) in
latent class analysis of natural mentoring relationships among a subsample of youth with
mentors (n=6801) from Wave III of the National Longitudinal Study of Adolescent Health
(2001-2002)*

	Class 1 (37%)	Class 2 (12%)	Class 3 (26%)	Class 4 (10%)	Class 5 (14%)
Type					
Family	0.073	0.073	0.965	0.693	0.709
School	0.760	0.164	0.005	0.102	0.070
Community	0.167	0.763	0.031	0.205	0.221
Time					
Childhood	0.007	0.002	0.832	0.790	0.015
Adolescence	0.915	0.364	0.147	0.192	0.939
Young Adult	0.078	0.634	0.021	0.018	0.046
Quality					
Length	0.050	0.000	0.988	1.000	0.063
Closeness	0.026	0.127	0.693	0.035	0.560
Contact	0.032	0.470	0.741	0.199	0.762

^{a} Probability of identifying natural mentor as each social role (i.e., family, school, or community) and developmental stage when natural mentor became important (i.e., childhood, adolescence, and young adulthood). For all others, probabilities represent answer being above average.
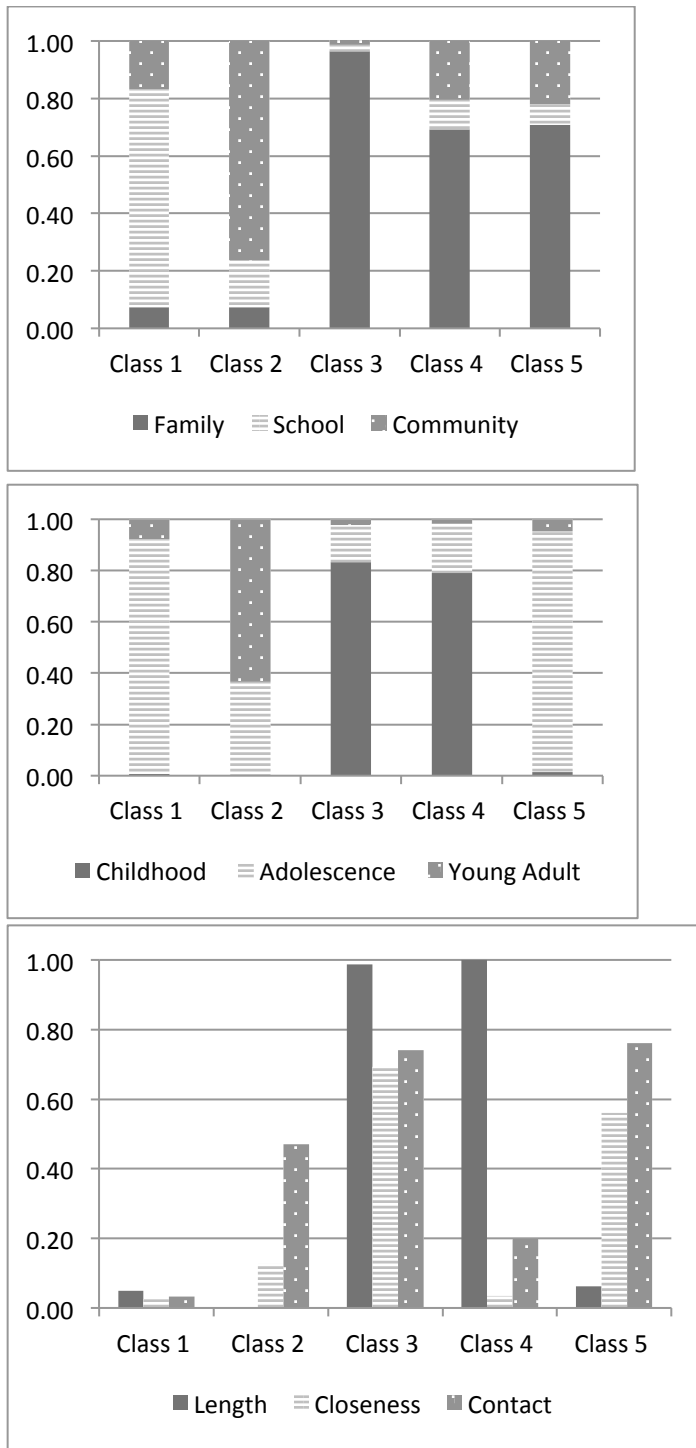
Figure 6: Item-response probabilities for type, time, and quality of the natural mentoring relationship within each of five latent classes.

Differences Across Latent Classes

The current study assessed various differences across the latent classes. First, the current study explored whether sexual orientation had an influence on latent class membership. Second, differences in youth demographics across classes, including gender, race/ethnicity, and age, were assessed. Finally, because one of the largest empirically derived classes included mostly school-based mentors, the current study explored whether educational attainment had an influence on latent class membership.

Before exploring these differences, measurement invariance of the latent variable across the dichotomous variables – sexual orientation identity, gender, race/ethnicity, and educational attainment – was examined. As shown in Table 16, both the likelihood ratio (LR) chi-square and the adjusted BIC indicated that measurement invariance held for two of these variables: sexual orientation identity and gender. For race and educational attainment, the LR chi-square suggested non-equivalence, while the adjusted BIC suggested measurement invariance. Given that the chi-square test is subject to bias with large sample sizes, the current study decided to rely on the adjusted BIC to determine that measurement invariance held for race/ethnicity and educational attainment.

Table 16
Measurement invariance across sexual orientation, gender, race, and educational attainment using a five-class model of natural mentoring relationships.

| | LR χ^2 (*df*) | | LR χ^2 (*df*) | BIC (Adjusted) | |
	H_0 Model	H_1 Model	Difference	H_0 Model	H_1 Model
Sexual Orientation	169.422 (64)	133.697 (99)	35.725 (35); *p*>.05	45419.290	45313.908
Gender	95.152 (64)	145.872 (99)	50.72 (35); *p*<.0417	50915.792	50842.456
Race	127.962 (128)	432.705 (233)	305.743 (105); *p*<.01	54721.916	54351.266
Education	122.165 (96)	271.547 (166)	148.382 (70); *p*<.01	53660.464	53481.923

NOTE: H_0 Model is the unconstrained model and H_1 Model is the semi-constrained model.

Once determined that the same measurement model holds across all groups, the current study examined differences in latent class prevalence based on posterior probabilities. Figures 7 through 10 show the percentage of youth in each latent class stratified by sexual orientation identity (Figure 7), gender (Figure 8), race/ethnicity (Figure 9), and educational attainment (Figure 10). From these figures, one can begin to see the differences and similarities in class prevalence based on these characteristics. For example, over half of sexual minority youth have past school mentors (52%), while only 36% of heterosexual youth are in this class. Heterosexual youth have a larger amount of permanent (27%) and recently-engaged family mentors (15%) than sexual minority youth (19% and 9%, respectively).

The prevalence of classes among females and males are more similar. Compared to males, females have slightly less past school (35% versus 40%) and newfound community mentors (11% versus 15%). However, they have more permanent (28% versus 22%) and recently-engaged family mentors (15% versus 10%). There are many differences and similarities when comparing the prevalence of classes across race/ethnicity. A little over a third of White youth's mentors are past school mentors (39%). There are slightly less among Hispanic youth (35%) and only 25% among Black/African American youth. Instead, 38% of Black/African American youth have permanent family mentors, compared to 29% among Hispanic youth, 24% among white youth, and 22% among other races. Black/African American youth have a small amount of newfound community mentors (5%), but a large amount of recently-engaged family mentors (25%). Hispanic youth also have a considerable amount of recently-engaged

family mentors (18%). White youth have the least amount of recently-engaged family mentors (11%), but more newfound community mentors (15%).

Not surprisingly, those with post-secondary education have the most amount of past school mentors (44%), but the least amount of permanent (21%) and recently-engaged family mentors (11%). Those with less than a high school diploma have a much greater number of permanent (42%) and recently-engaged family mentors (23%) and the least amount of past school mentors (16%).
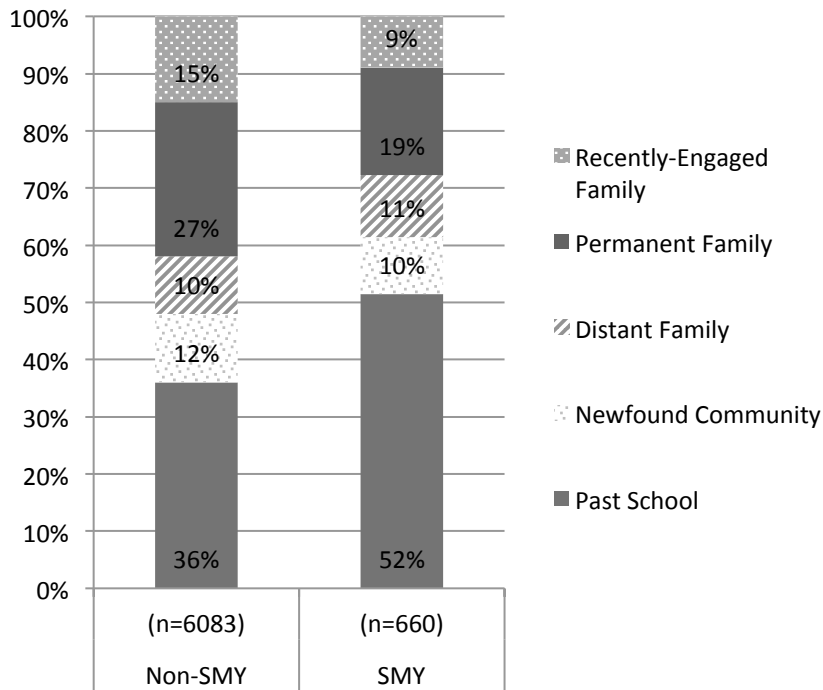
Figure 7: Percentage of youth in each latent class based on estimated posterior probabilities stratified by sexual orientation.
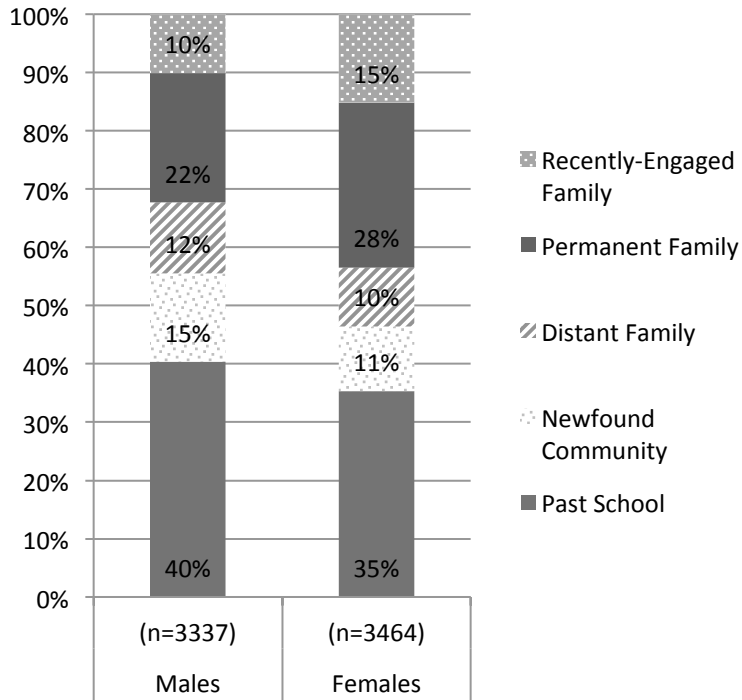
Figure 8: Percentage of youth in each latent class based on estimated posterior probabilities stratified by gender
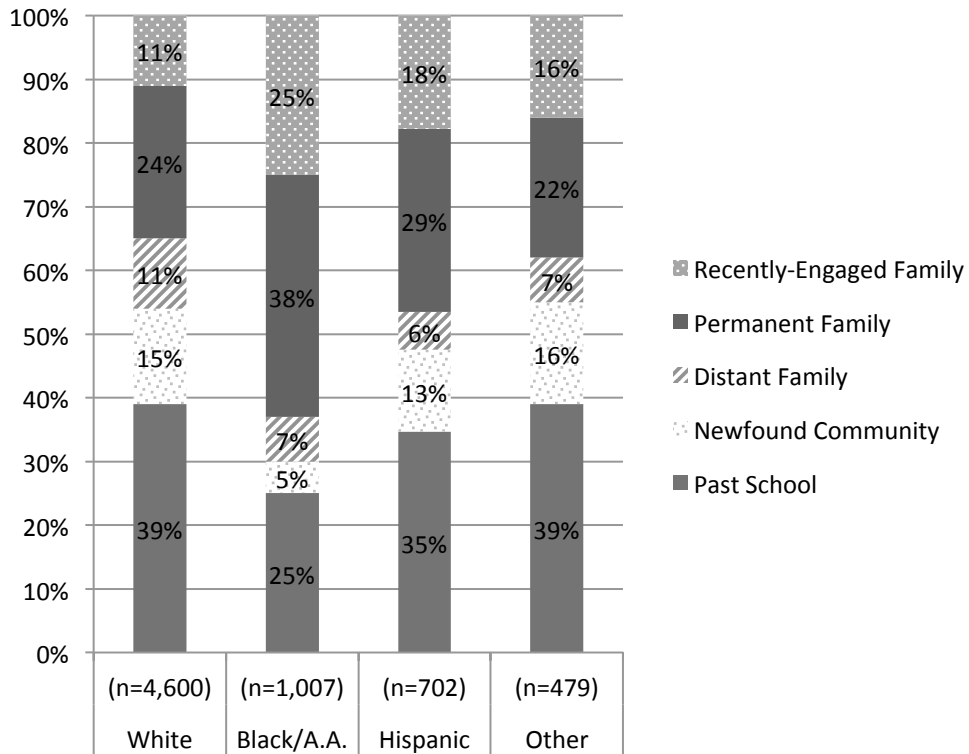
Figure 9: Percentage of youth in each latent class based on estimated posterior probabilities stratified by race/ethnicity.
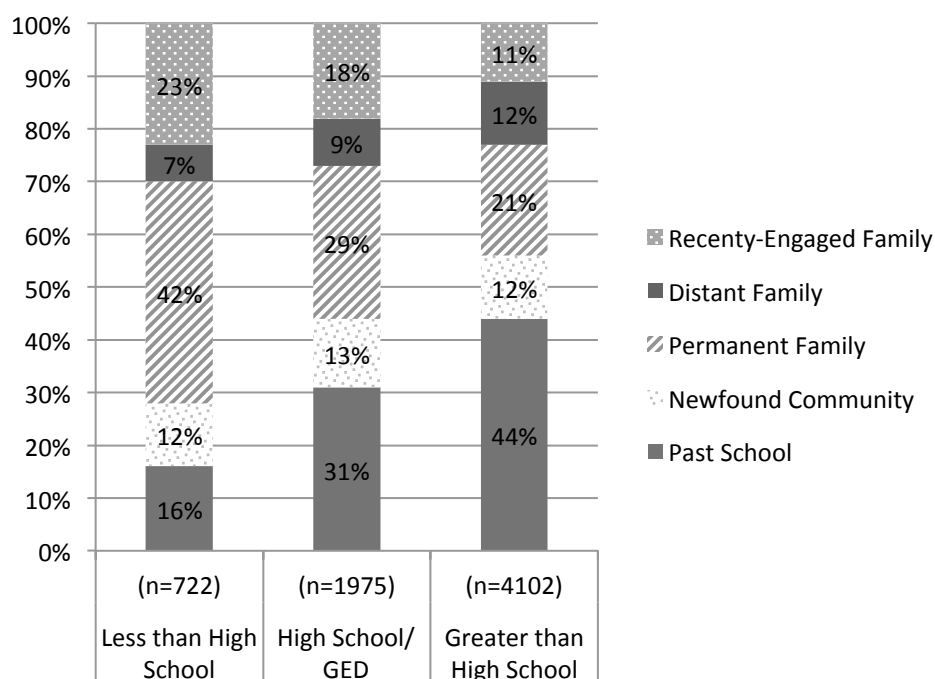
Figure 10: Percentage of youth in each latent class based on estimated posterior probabilities stratified by educational attainment.

Next, the current study ran a model-based latent class multinomial logistic regression. This was done to test the statistical significance of the relationship between youth characteristics and class membership. Multinomial regression was used because the independent variables were the youth characteristics and the outcome was latent class membership, which was nominal. It is important to note that, in a multinomial logistic regression, one category on the outcome variable must be chosen as a reference group. All results are relative to that reference group. The current study used *past school mentor* as the reference group. This was done for two reasons: 1) sexual minority youth had a much higher prevalence of past school mentors than heterosexual youth, and 2) in separate sensitivity analyses no significant relationships were found for sexual minority youth when using one of the other classes as the reference group. As shown in Table 17,

all results from the multinomial logistic regression using past school mentor as the reference group are presented as logits (i.e., the natural log of the odds).

Similar to what was found in class prevalence above, when compared to heterosexual youth, sexual minority youth were significantly more likely to have had a past school mentor than to have had three of the other types of mentors. This included a newfound community mentor ($b = -0.58$, $p<.01$), permanent family mentor ($b = -0.81$, $p<.001$) and recently-engaged family mentor ($b = -0.96$, $p<.001$).

The current study also found that females (compared to males) were significantly more likely to have a permanent family ($b=0.54$, $p<.001$) or recently engaged family mentor ($b=0.78$, $p<.001$) than a past school mentor. When compared to White youth, Black/African American youth were significantly less likely to have a newfound community mentor ($b= -0.70$, $p<.05$) than a past school mentor. However, they were more likely to have a permanent family ($b=0.75$, $p<.001$) or recently engaged mentor ($b=1.04$, $p<.001$). Hispanic youth (when compared to White youth) were also significantly more likely to have a recently engaged family mentor than a past school mentor ($b=0.49$, $p<.01$).

Age was also significantly related to class membership, in that as youth get older they were more likely to have newfound community ($b=0.32$, $p<.001$), permanent family ($b=0.07$, $p<.05$), and distant family mentors ($b=0.18$, $p<.01$), but less likely to have recently-engaged mentors ($b= -0.10$, $p<.05$), when compared to past school mentors. Finally, educational attainment was also significantly related to class membership. The current study found that, when compared to those with a high school diploma/GED, youth with less than a high school diploma were more likely to have permanent family

(b=0.98, p<.001) and recently-engaged family mentors (b=0.97, p<.001), than past school

mentors. Conversely, those with at least some post-secondary education (compared to

those with only a high school diploma/GED) were less likely to have permanent (b= -

0.54, p<.01) and recently-engaged family (b= -0.64, p<.001) mentors, as well as

newfound community mentors (b= -0.61, p<.001) (compared to past school mentors).

Table 17
Relationship between youth demographics and membership in five latent classes of
natural mentoring relationships, using Past School Mentor as the reference group

	Newfound Community	Permanent Family	Distant Family	Recently Engaged Family
		Logit (SE)		
SMY	-0.58 (0.20)**	-0.81 (0.16)***	-0.44 (0.26)	-0.96 (0.27)***
Female	-0.12 (0.17)	0.54 (0.09)***	0.08 (0.15)	0.78 (0.12)***
Black[a]	-0.70 (0.32)*	0.75 (0.13)***	0.04 (0.27)	1.04 (0.18)***
Hispanic[a]	0.05 (0.26)	0.25 (0.17)	-0.32 (0.26)	0.49 (0.19)**
Other[ab]	0.36 (0.27)	0.03 (0.18)	-0.40 (0.33)	0.35 (0.27)
Age[c]	0.32 (0.05)***	0.07 (0.03)*	0.18 (0.06)**	-0.10 (0.04)*
< High School[d]	0.34 (0.35)	0.98 (0.18)***	0.45 (0.26)	0.97 (0.24)***
> High School[d]	-0.54 (0.21)**	-0.61 (0.12)***	0.00 (0.20)	-0.64 (0.14)***
Intercept	-1.08 (0.16)***	-0.41 (0.10)***	-1.23 (0.20)***	-1.37 (0.16)***

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design.
[a] Reference Group = White
[b] Other includes those who identified as Asian, Native American, Multi-Racial, and Other.
[c] Age is mean centered.
[d] Reference group = high school diploma/GED.

Effect of Latent Class Membership on Mental Health and Substance Abuse
Outcomes

As explained earlier, the current study used the maximum-probability assignment

technique with an inclusive LCA classification model to examine the effects of latent

class membership on mental health and substance abuse outcomes. In other words, the

current study assigned each individual a class based on the one in which they had the

highest probability. These posterior probabilities were estimated in separate inclusive

LCA classification models for each outcome. This class was then treated as a manifest

variable in binary logistic regressions for each outcome. Although not accounting for the

classification error, this method did help to reduce bias and allowed for controlling for

gender, race/ethnicity, age, educational attainment, and childhood poverty.

As can be seen in Table 18, preliminary bivariate analyses show a significant

difference in self-esteem, binge drinking, and drinking-related problems across latent

classes of natural mentoring relationships. Those with permanent and recently-engaged

families have a lower risk of binge drinking and drinking-related problems, and higher

self-esteem. Five to six percent more of those with permanent or recently engaged family

mentors have high self-esteem than those with distant family, newfound community, or

past school mentors. Similar patterns are found with drinking-related problems.

Recently-engaged family mentors are particularly beneficial in terms of binge drinking;

only 46% of youth with these mentors binge drink, compared to 57% of youth with past

school mentors, 56% of those with distant family mentors, 54% of youth with newfound

community mentors, and 50% of those with permanent family mentors.

Table 18
*Percentage of youth (n=6,801) with each mental health and substance abuse outcome
across five classes of natural mentoring relationships.*

	Past School	Newfound Community	Distant Family	Recently-Engaged Family	Permanent Family
Depression	17.66	14.86	17.34	18.19	17.70
Suicide Ideation	7.20	8.09	6.55	6.37	4.83
Self-Esteem*	50.76	50.11	50.90	55.76	56.67
Life Satisfaction	85.10	86.06	83.91	87.02	86.65
Marijuana Use	24.20	23.43	23.33	19.89	21.99
Illicit Drug Use	6.43	7.73	7.87	6.48	6.53
Binge Drinking***	57.00	53.97	55.72	46.16	49.69
Drinking-Related Problems*	30.69	28.19	31.49	25.24	25.19

*$p<.05$; **$p<.01$; ***$p<.001$; All analyses adjusted for complex survey design.

Interestingly, in the binary logistic regressions, where we are able to control for

various factors that may affect mental health and substance abuse outcomes, the

significant differences in substance abuse outcomes disappear (Tables 19 and 20). On the

other hand, the current study found several significant differences in mental health

outcomes.

Table 19
Logistic regression of mental health outcomes using maximum-probability assignment based on inclusive LCA posterior probabilities.

	Depression	Suicide Ideation	Self Esteem	Life Satisfaction
		O.R. (95% C.I.)		
Vs. Past School				
Recently-Engaged Family	0.80 (0.58, 1.09)	0.94 (0.62, 1.42)	1.23 (0.98, 1.53)	1.40 (0.97, 2.01)
Permanent Family	0.81 (0.64, 1.01)	0.72 (0.48, 1.08)	**1.30 (1.05, 1.60)***	**1.33 (1.05, 1.67)***
Distant Family	0.97 (0.72, 1.31)	0.99 (0.62, 1.58)	0.98 (0.78, 1.24)	0.95 (0.69, 1.30)
Newfound Community	0.77 (0.58, 1.01)	1.25 (0.80, 1.94)	1.00 (0.80, 1.24)	1.09 (0.80, 1.50)
Vs. Recently-Engaged Family				
Permanent Family	1.01 (0.75, 1.37)	0.77 (0.47, 1.25)	1.06 (0.82, 1.36)	0.95 (0.68, 1.32)
Distant Family	1.22 (0.83, 1.78)	1.06 (0.63, 1.77)	0.80 (0.61, 1.05)	0.68 (0.45, 1.02)
Newfound Community	0.96 (0.66, 1.41)	1.33 (0.73, 2.43)	0.81 (0.63, 1.06)	0.78 (0.51, 1.19)
Vs. Permanent Family				
Distant Family	1.20 (0.88. 1.63)	1.38 (0.85, 2.24)	**0.76 (0.59, 0.98)***	0.72 (0.50, 1.01)
Newfound Community	0.95 (0.70, 1.28)	**1.74 (1.10, 2.75)***	0.77 (0.59, 1.01)	0.83 (0.58, 1.17)
Vs. Distant Family				
Newfound Community	0.79 (0.54, 1.15)	1.26 (0.73, 2.16)	1.01 (0.77, 1.34)	1.15 (0.81, 1.65)

*$p<.05$; **$p<.01$; ***$p<.001$; all analyses adjusted for complex survey design and controlling for sexual orientation, gender, age, race, education, and poverty.

There were significant differences in suicide ideation between those with

permanent family mentors and those with newfound community mentors (O.R.=1.74

$p<.05$). Those with newfound community mentors had 74% higher odds of experiencing

suicide ideation than those with permanent family mentors. There were significant

differences in self-esteem between youth with permanent family mentors and youth with

past school mentors (O.R.=1.30, $p<.05$). Those with permanent family mentors had 30%

higher odds of experiencing high self esteem than those with past school mentors.

Additionally, the current study found that those with distant family mentors had lower odds of having high self-esteem than those with permanent family mentors (O.R.=0.76, *p*<.05). Those with permanent family mentors also had 33% higher odds of life satisfaction than those with past school mentors (O.R.=1.33, *p*<.05).

Table 20
Logistic regression of substance abuse outcomes using maximum-probability assignment based on inclusive LCA posterior probabilities.

	Marijuana Use	Illicit Drug Use	Binge Drinking	Drinking-Related Problems
	O.R. (95% C.I.)			
Vs. Past School				
Recently-Engaged Family	0.92	1.35	0.95	0.99
	(0.67, 1.28)	(0.83, 2.18)	(0.73, 1.24)	(0.73, 1.36)
Permanent Family	1.01	1.37	1.01	0.95
	(0.80, 1.27)	(0.98, 1.90)	(0.84, 1.22)	(0.77, 1.19)
Distant Family	1.02	1.47	1.02	1.13
	(0.78, 1.32)	(0.97, 2.21)	(0.82, 1.28)	(0.90, 1.42)
Newfound Community	1.08	1.47	0.90	0.99
	(0.83, 1.42)	(0.89, 2.43)	(0.73, 1.11)	(0.78, 1.27)
Vs. Recently-Engaged Family				
Permanent Family	1.09	1.01	1.06	0.96
	(0.79, 1.59)	(0.59, 1.73)	(0.81, 1.40)	(0.70, 1.31)
Distant Family	1.10	1.09	1.08	1.14
	(0.76, 1.59)	(0.59, 2.00)	(0.80, 1.44)	(0.80, 1.61)
Newfound Community	1.17	1.09	0.95	1.00
	(0.82, 1.68)	(0.56, 2.12)	(0.70, 1.27)	(0.71, 1.41)
Vs. Permanent Family				
Distant Family	1.01	1.07	1.02	1.19
	(0.76, 1.33)	(0.70, 1.65)	(0.80, 1.28)	(0.94, 1.50)
Newfound Community	1.07	1.08	0.89	1.04
	(0.79, 1.46)	(0.62, 1.86)	(0.71, 1.11)	(0.79, 1.37)
Vs. Distant Family				
Newfound Community	1.07	1.00	0.88	0.88
	(0.77, 1.48)	(0.60, 1.68)	(0.69, 1.12)	(0.65, 1.18)

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design and controlling for sexual orientation, gender, age, race, education, and poverty.

The current study found significant sexual orientation-based differences in the relationship between latent class membership and two of the health outcomes: self-esteem and drinking-related problems (Tables 21 and 22, respectively). Specifically,

sexual orientation moderated the relationship between self-esteem and having a permanent family mentor versus a newfound community mentor (O.R.=2.40, *p*<.05). In post-hoc analyses, the current study found that heterosexual youth had 1.39 times the odds of having high self-esteem if they had a permanent family mentor in comparison to a newfound community mentor (*F*=5.09, *p*<.05). However, there was no significant difference for sexual minority youth (*F*=2.12, *p*=0.148). For ease of interpretation, Figure 11 provides the odds of having high self-esteem for each latent class stratified by sexual orientation.

Table 21

Interaction effects between sexual orientation and each latent class in separate logistic regressions for mental health outcome.

	Depression	Suicide Ideation	Self Esteem	Life Satisfaction
		O.R. (95% C.I.)		
Vs. Past School				
Recently-Engaged Family	0.65 (0.20, 2.17)	0.97 (0.28, 3.39)	1.25 (0.59, 2.67)	0.40 (0.16, 1.01)
Permanent Family	1.35 (0.69, 2.63)	0.97 (0.42, 2.25)	0.86 (0.47, 1.55)	0.57 (0.27, 1.21)
Distant Family	0.76 (0.31, 1.88)	0.88 (0.25, 3.14)	1.23 (0.58, 2.61)	0.59 (0.25, 1.37)
Newfound Community	0.85 (0.34, 2.14)	0.82 (0.29, 2.34)	2.06 (0.95, 4.50)	0.94 (0.32, 2.81)
Vs. Recently-Engaged Family				
Permanent Family	2.07 (0.53, 8.09)	0.99 (0.28, 3.51)	0.69 (0.30, 1.55)	0.35 (-0.63, 1.34)
Distant Family	1.17 (0.28, 4.92)	0.90 (0.17, 4.77)	0.99 (0.37, 2.63)	0.38 (-0.78, 1.54)
Newfound Community	1.31 (0.33, 5.18)	0.85 (0.20, 3.57)	1.65 (0.61, 4.46)	0.85 (-0.25, 1.95)
Vs. Permanent Family				
Distant Family	0.57 (0.20, 1.60)	0.91 (0.24, 3.37)	1.44 (0.63, 3.25)	1.03 (0.40, 2.62)
Newfound Community	0.63 (0.34, 1.67)	0.85 (0.28, 2.59)	**2.40 (1.08, 5.36)***	1.65 (0.59, 4.62)
Vs. Distant Family				
Newfound Community	1.12 (0.31, 4.04)	0.93 (0.26, 3.40)	1.67 (0.62, 4.54)	1.60 (0.44, 5.82)

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design and controlling for gender, age, race, education, and poverty.
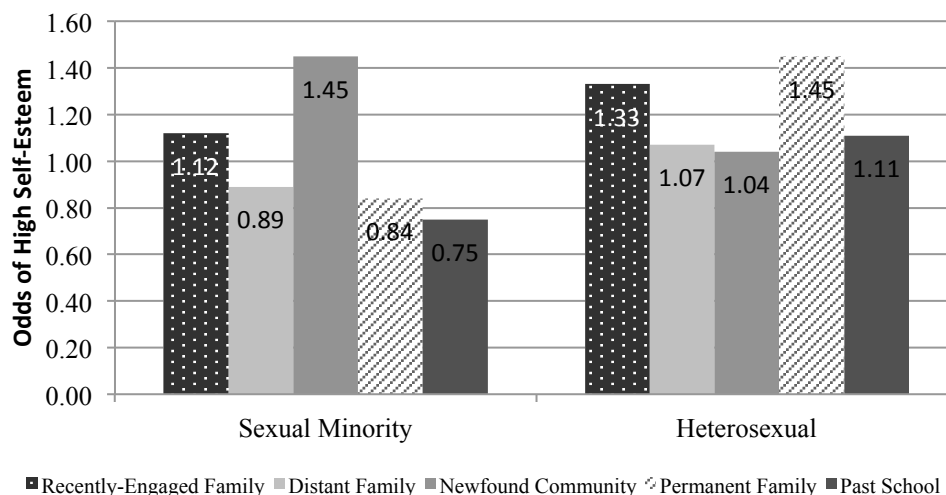
Figure 11: Odds of having high self-esteem for each latent class, stratified by sexual orientation.

The current study found that sexual orientation moderated the relationship between drinking-related problems and having a past school mentor in comparison to a newfound community (O.R.=2.27, *p*<.05) or distant family mentor (O.R.=2.41, *p*<.05). Additionally, there was an interaction effect with sexual orientation for those that had a permanent family mentor versus a newfound community (O.R.=3.08, *p*<.05) or distant family (O.R.=3.28, *p*<.01) mentor. In post-hoc analyses, the current study found that there were no significant differences in the relationship between latent class membership and drinking-related problems for heterosexual youth. On the other hand, sexual minority youth who had a newfound community (*F*=4.34, *p*<.05) or distant family mentor (*F*=4.72, *p*<.05) were more likely to have drinking related problems than those with a past school mentor (O.R.= 2.06 and 2.45, respectively). Similarly, when compared to those with a permanent family mentor, the odds of experiencing drinking-related problems increased by a factor of 2.89 if they had a newfound community mentor (*F*= 5.48, *p*<.05), and 3.44 if they had a distant family mentor (*F*= 9.01, *p*<.01). To help with

interpretation, Figure 12 presents the odds of experiencing drinking-related problems for

each latent class stratified by sexual orientation.

Table 22
Interaction effects between sexual orientation and each latent class in separate logistic regressions for substance abuse outcome.

	Marijuana Use	Other Illicit Drug Use	Binge Drinking	Drinking-Related Problems
	O.R. (95% C.I.)			
Vs. Past School				
Recently-Engaged Family	1.02 (0.40, 2.61)	0.75 (0.20, 2.87)	1.30 (0.51, 3.36)	1.34 (0.60, 2.99)
Permanent Family	1.03 (0.53, 1.98)	1.00 (0.38, 2.66)	0.71 (0.38, 1.33)	0.74 (0.40, 1.34)
Distant Family	0.60 (0.25, 1.44)	1.13 (0.39, 3.26)	1.05 (0.45, 2.48)	**2.41 (1.03, 5.64)***
Newfound Community	1.31 (0.55, 3.12)	0.97 (0.29, 3.24)	1.40 (0.62, 3.17)	**2.27 (1.06, 4.87)***
Vs. Recently-Engaged Family				
Permanent Family	1.02 (0.42, 2.45)	1.33 (0.29, 6.17)	0.54 (0.21, 1.40)	0.55 (0.22, 1.36)
Distant Family	0.59 (0.19, 1.80)	1.51 (0.32, 7.18)	0.81 (0.26, 2.56)	1.80 (0.55, 5.87)
Newfound Community	1.29 (0.40, 4.17)	1.29 (0.25, 6.79)	1.08 (0.33, 3.50)	1.70 (0.52, 5.56)
Vs. Permanent Family				
Distant Family	0.58 (0.22, 1.52)	1.13 (0.37, 3.40)	1.49 (0.58, 3.82)	**3.28 (1.41, 7.63)****
Newfound Community	1.27 (0.48, 3.38)	0.97 (0.26, 6.54)	1.98 (0.77, 5.10)	**3.08 (1.19, 8.00)***
Vs. Distant Family				
Newfound Community	2.19 (0.73, 6.55)	0.86 (0.20, 6.61)	1.33 (0.52, 3.41)	0.94 (0.28, 3.10)

*p<.05; **p<.01; ***p<.001; all analyses adjusted for complex survey design and controlling for gender, age, race, education, and poverty.

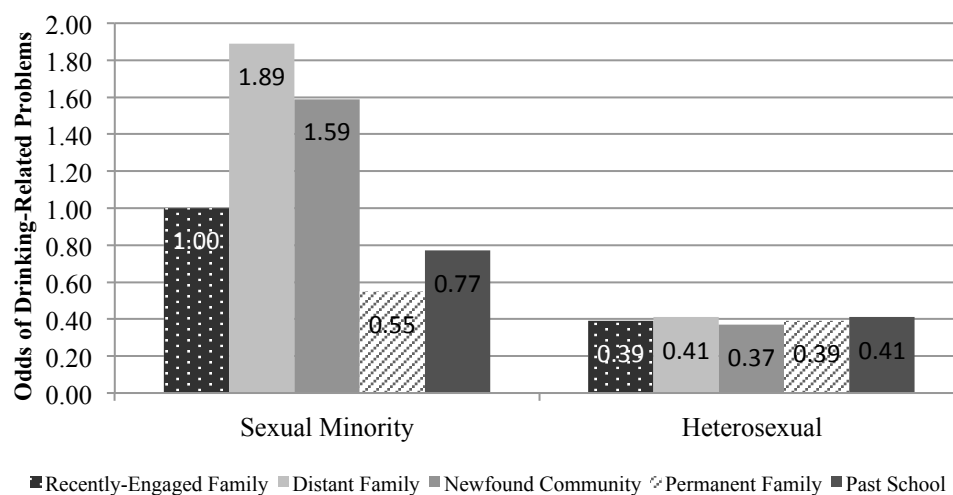*Figure 12:* Odds of experiencing drinking-related problems for each latent class, stratified by sexual orientation.

CHAPTER V: DISCUSSION

The current study examined the role of natural mentors in improving mental health and substance abuse outcomes for sexual minority youth using a large, nationally representative dataset. Both variable-centered and person-centered analyses were used to explore whether the relationship between sexual orientation and a range of mental health and substance abuse outcomes varied by the presence of a natural mentor and various dimensions of the natural mentoring relationship. This chapter provides a discussion of the major findings, policy and practice implications, as well as limitations and future research to consider.

Major Findings

Sexual Orientation Health Disparities Replicated

First, the current study replicated previous study findings that show significant disparities in all mental health and substance abuse outcomes for sexual minority youth (Saewyc, 2011). The largest disparity found in the current study is the difference in suicide ideation; sexual minority youth are 3.2 times more likely to have suicide ideation in the past year compared to heterosexual youth. Similarly, sexual minority youth are two times as likely to have drinking-related problems and depression, and *over* two times as likely to use marijuana or other illicit drugs. They also are more likely than heterosexual youth to binge drink, and less likely to have high self-esteem and life satisfaction. These sexual orientation disparities have been well established within the last decade of research. It is time for sexual minority youth research to turn their attention to the causes of these disparities and effective policy and practice changes to help overcome them.

The minority stress theory is one of the most prominent theories currently used

for explaining sexual orientation disparities. The minority stress theory posits that sexual minority youth are experiencing higher rates of mental health and substance abuse issues because of additive minority-specific stressors in their lives (Meyer, 2003). These stressors stem from the larger issues of discrimination and stigma in our society. For example, sexual minority youth have been found to experience physical and emotional violence (Burton et al., 2013), school bullying (Russell, Everett, Rosario, & Birkett, 2014), family rejection (Ryan et al., 2009), and stress from concealment of their identity, coming out, and internalized homophobia (Rosario et al., 2010; Shilo & Mor, 2014). These stressors may be especially pronounced during adolescence, when a sexual minority youth is forming an identity that is counter to societal norms of heterosexuality.

While addressing the larger societal issues that ultimately lead to sexual orientation disparities is essential, we must also find sources of resilience for sexual minority youth to help them cope with the stigma and discrimination they face. Resiliency theory provides specific models of resilience that explain how individual and environmental factors work to reduce the adverse effects of risk (Garmezy et al., 1984). The current study tested two of these models when exploring natural mentors as a resilience resource for sexual minority youth: the compensatory and protective factor models.

Natural Mentors Act as a Compensatory Resiliency Resource

As explained in the discussion of resiliency theory in chapter two, the two models of resilience can be directly tested within multiple regression equations. In the compensatory model the resilience factor has a direct and independent relationship with the outcome when accounting for the risk factor. It simply works to reduce, or

compensate for, the effect of the risk on the outcome. On the other hand, in the protective factor model, the resilience factor actually interacts with the risk factor to reduce the probability of a negative outcome (Fergus & Zimmerman, 2005).

The current study found that natural mentors act as a compensatory, but not necessarily a protective resiliency resource. This means that natural mentors have a direct association with mental health and substance abuse outcomes for both sexual minority and heterosexual youth. Given that the relationship between natural mentors and health outcomes is current even when accounting for the risk factor (i.e., sexual orientation), one can conclude that natural mentors counteract the negative effect of sexual orientation. However, the associations between sexual orientation and health outcomes are the same regardless of natural mentor presence. This indicates that natural mentors do not actually modify the relationship between sexual orientation and mental health and substance abuse outcomes.

The current findings support two recent studies that directly tested the compensatory and protective factor models when exploring social support as a resilience resource for sexual minority youth (Mustanski et al., 2011; Reisner et al., 2014). Mustanski and colleagues (2011), in a sample of sexual minority youth, found that peer and family support had an independent effect on psychological distress, even when controlling for victimization. However, a test of the protective factor model found that the effect of victimization did not vary based on social support. Similarly, Reisner and colleagues (2014) found that family support had an independent effect on non-suicidal self-injury and suicide attempts while controlling for sexual orientation identity, supporting a compensatory model.

In the current study, both the presence and the characteristics of the natural mentoring relationship show compensatory, but not protective, effects on mental health and substance abuse outcomes. While natural mentors may not ameliorate sexual orientation disparities, it is still important to note that natural mentors have the same impact on sexual minority and heterosexual youth. Taken together with the fact that sexual minority youth suffer from higher rates of poor mental health and substance abuse outcomes, this finding argues for an increase in the number of natural mentors among sexual minority youth in order to help compensate for these risks. Specifically, close natural mentoring relationships have the greatest impact on positive mental health outcomes, such as self-esteem and life satisfaction. These findings, assessed in light of the current literature on natural mentors, are discussed in greater detail below.

Natural Mentors have the Strongest Relationship with Positive Mental Health Outcomes

The current study found that the presence of a natural mentor has a significant positive association with self-esteem and life satisfaction for all youth. However, there is no significant relationship between natural mentor presence and depression, suicide ideation or drug use, and actually has a negative association with alcohol use and abuse. In other words, those with natural mentors have higher odds of binge drinking and experiencing drinking-related problems. The empirical evidence regarding the impact of natural mentors on these mental health and substance abuse outcomes is inconclusive. While several studies have found a significant relationship between natural mentor presence and depression and suicide (Hurd & Zimmerman, 2010b; Sterrett, Jones, McKee, & Kincaid, 2011; Whitney et al., 2011), others have found that natural mentors

only have an effect on positive mental health outcomes (DuBois & Silverthorn, 2005b; Hurd & Zimmerman, 2013). Similarly, some studies have found a positive effect of natural mentors on substance abuse outcomes (Black et al., 2010; Darwich et al., 2012; Zimmerman et al., 2002), others have found a negative effect (Hurd et al., 2014), and still others have found no effect at all (DuBois & Silverthorn, 2005b; Munson & McMillen, 2009).

In first considering the finding that natural mentors increase alcohol use and abuse, it could be that youth actually see alcohol use as an effective coping strategy during emerging adulthood. In support of this hypothesis, Hurd and colleagues (2014) found an indirect effect of natural mentors on increased alcohol use via greater perceived coping ability. The current study also found that the provision of tangible support could be partly driving the negative relationship between natural mentors and alcohol use and abuse. Having a mentor who provides more tangible support, such as financial help, may actually increase access and use of substances. It is important to keep in mind that most natural mentors provide multiple types of support. It is conceivable that a natural mentor benefits a youth emotionally by providing a close relationship and buffering against some minority-specific stressors, but also provides tangible support that increases access and use of substances.

On the other hand, the current study also found that friendship support acts as a protective factor against alcohol use and abuse. Having peers and natural mentors who disapprove of misconduct (including substance use) has a large impact on problem behaviors among youth (Beam et al., 2002). This suggests that the combined effect of having a natural mentor who provides similar support as a peer (i.e., friendship support)

and does not see alcohol use as a positive coping strategy may be a significant buffer against binge drinking and experiencing drinking-related problems. It is important to note that because this is a cross-sectional study, it is also possible that youth who are already struggling with alcohol use may be more likely to attract, seek out, or be encouraged by others to develop natural mentoring relationships. The limitations of this single-time-point study are discussed in more detail below (see section on limitations and future research).

While the type of support matters for alcohol use and abuse, simply having a natural mentor consistently has a positive association with self-esteem and life satisfaction. This suggests that natural mentors are best positioned to increase positive outcomes, rather than reduce risks. In fact, Rhodes' (2005) developmental model of youth mentoring focuses on the promotion of positive developmental outcomes, rather than the reduction of risk (Hurd & Zimmerman, 2013). For example, Rhodes and DuBois (2008) note that mentors may help youth to build a positive sense of self and others through affirmative interactions and access to resources and social opportunities. Natural mentors alone may not have the potential to decrease more persistent and deeply rooted issues, such as depression, suicide ideation, and drug use. Therefore, it may be best to utilize natural mentors alongside other evidence-based programs and strategies. For example, the ability of mentors to increase self-esteem and life satisfaction may enhance mental health interventions that have been effective in decreasing these risks, such as support groups and individual counseling.

It is possible that the current study did not find a relationship between natural mentor presence and depression, suicide ideation, or illicit drug use because of the small

sample of total youth that reported these outcomes: 18.7%, 6.7% and 7.3% respectively. Additionally, as other studies have suggested, a complex relationship exists between factors such as self-esteem and life satisfaction and mental health and substance abuse (Gutierrez, Freedenthal, Wong, Osman, & Norizuki, 2012; Langhinrichsen-Rohling et al., 2010; Rutter, 2008). Given this, it may be more valuable to conduct a latent class analysis to empirically derive underlying sub-groups of inter-related mental health and substance abuse outcomes. It would then be possible to explore whether natural mentor presence impacts latent class membership that is based on a variety of mental health and substance abuse outcomes.

Perceived Closeness is a Key Characteristic in Natural Mentoring Relationships

Several studies have found that the magnitude of the effect of a natural mentor is dependent on specific characteristics of the relationship, such as the social role of the mentor, the length of the relationship, and the frequency of contact and closeness (DuBois & Silverthorn, 2005a; Hurd & Zimmerman, 2013; Whitney et al., 2011). Therefore, we might expect that specific characteristics of the natural mentoring relationship are important to reducing the sexual orientation disparities in mental health and substance abuse outcomes. The current study found that only perceived closeness consistently had significant associations with mental health and substance abuse outcomes. Specifically, perceived closeness is related to lower depression, suicide ideation, and binge drinking, and higher self-esteem and life satisfaction.

This finding supports both theory and a growing body of empirical evidence that emphasizes closeness as a critical element in mentoring relationships. Several studies have found that closeness has a significant effect on mental health and substance abuse

outcomes (Bayer, Grossman, & DuBois, 2015; DuBois et al., 2011; DuBois & Silverthorn, 2005a; Hurd & Zimmerman, 2013; Parra, DuBois, Neville, Pugh Lilly, & Povinelli, 2002; Rhodes et al., 2006; Spencer, 2006; Whitney et al., 2011). For example, Hurd and Zimmerman (2013) found that having increased closeness in a mentoring relationship increased life satisfaction and decreased depressive symptoms. Similarly, Whitney et al. (2011) found that high quality mentoring relationships, based on length and level of closeness, were significantly related to higher self-esteem, fewer alcohol problems, and less depressive affect when compared to low quality mentors.

Theoretically, the current study's finding supports Rhodes' (2005) developmental model of youth mentoring relationships, in which she notes that an essential prerequisite for the accrual of benefits is a strong and meaningful connection. In other words, a close relationship is critical for mentors to help youth with such tasks as building interpersonal skills, revising working models of relationships, enhancing coping skills, increasing social capital, and developing positive identities. It makes sense that when a strong bond is present, a youth may receive more emotional support from their mentor and may be more open to advice and tangible assistance. A close emotional tie may also enhance a youth's trust and relatedness towards others, facilitating social development (Parra et al., 2002).

These findings shed light on the fact that simply having a mentor may only affect positive mental health outcomes; however, having a close mentor is consistently a key resilience resource against mental health and substance abuse risks. Notably, the current study found that sexual minority youth, when compared to heterosexual youth, perceive significantly less closeness in their relationships with natural mentors. In other words,

although a similar percentage of sexual minority and heterosexual youth identify at least one non-parental supportive adult in their lives since they were 14 years old, in their transition to adulthood they may not equally be benefiting from a close relationship with their natural mentor.

As mentioned earlier, because sexual minority youth have a greater risk for substance abuse and mental health issues, increasing the percentage of sexual minority youth that have natural mentors could be beneficial in reducing these negative health outcomes. The current study findings help us in understanding that it will also be critical to increase closeness in either existing or newly developed natural mentoring relationships. The key question then becomes: how can we increase the number of close natural mentors in the lives of sexual minority youth?

Rhodes (2005) notes that a strong and meaningful connection is built on mutuality, empathy, and trust. However, a close connection is often the result, not necessarily the focus, of effective mentoring relationships (Hamilton & Hamilton, 2010). In fact, some studies have found that it could be counterproductive to just focus on developing emotional connections and providing unconditional support without structure (Langhout, Rhodes, & Osborne, 2004). As Brady, Dolan and Canavan (2015) found, some types of mentorship support, such as concrete and companionship support (e.g., participating in community social activities or working on goal-oriented tasks), can be offered without a close relationship. Regularly participating in activities such as these offers a foundation for building closeness over time (Brady et al., 2015).

The other key factors in building relational closeness are frequency of contact and duration of the relationship (Bayer et al., 2015; Grossman & Rhodes, 2002; Hurd &

Zimmerman, 2013; Parra et al., 2002). As in all relationships, mentoring relationships develop gradually and their effects grow stronger with time. Bayer et al. (2015) studied youth in a formal mentoring program and found that frequency of contact, punctuality of the mentor to scheduled meetings, and mentor training significantly increased youth's perceived closeness in the mentoring relationship. Interestingly, while they found that perceived closeness had a benefit for academic outcomes, they found that match duration did not have an impact above that of perceived closeness.

Similarly, the current study did not find a significant association between health outcomes and frequency of contact or length of relationship when included in a model with perceived closeness. One reason for this may be that the length of time, on average, was of relatively long duration (i.e., 9-10 years) in the current study. This longevity may limit the effect that this variable has on the outcomes. Additionally, given that this study was not focused on strategies for developing closeness in a relationship, the current study did not test for an indirect effect of length of relationship or frequency of contact on outcomes via perceived closeness, which has been found in other studies (Parra et al., 2002).

Latent Classes of Natural Mentoring Relationships Impact Outcomes

It is difficult to characterize the most important part of a relationship. Instead, relationships are inherently multi-dimensional with interdependent characteristics. Therefore, using a person-centered approach to better understand underlying subgroups of natural mentoring relationships based on multiple characteristics seems both intuitive and beneficial. Given that only one study to the author's knowledge has used a person-centered approach to analyze dimensions of natural mentoring relationships (Hurd &

Zimmerman, 2013), a key finding of the current study was in identifying and describing the five latent classes of natural mentoring relationships.

As might be expected, there is a group of young adults with school mentors from the past, but who are not necessarily a strong mentor in their current lives. There is also a group of youth with newfound community mentors, which may be expected given their stage of development as they transition into adulthood. Interestingly, there are three distinct classes of family mentors. The largest group is comprised of family members who have been in the youth's life for a long time and with whom they are currently very close (i.e., permanent family). The youths' stage of development may also explain the presence of the two remaining types of family mentors: those who are newly-engaged and those with whom the youth no longer has a strong relationship (i.e., distant family).

The findings from the current study extend the empirical findings from Hurd and Zimmerman's (2013) latent profile analysis. They used relationship longevity, contact, and closeness to identify latent profiles of natural mentoring relationships. They found three distinct classes: long-standing mentors, frequent contact mentors, and less engaged mentors. Hurd and Zimmerman (Hurd & Zimmerman, 2013) note that over half of the long-standing mentors, which were marked by long relationships with high perceived closeness, were family mentors. This is similar to the current study, which found a significant class of mentors to be permanent family who have longer than average relationships with frequent contact and high levels of perceived closeness.

The current study found that when controlling for age, gender, race/ethnicity, sexual orientation, educational attainment and childhood poverty, latent class membership had a significant association with mental health outcomes for youth,

including suicide ideation, self-esteem, and life satisfaction. Permanent family mentors provided the most benefit to youth. Youth with permanent family mentors were more likely to have high self-esteem when compared to distant family mentors, and had lower odds of suicide ideation when compared with those with newfound community mentors. Compared to past school mentors, those with permanent family mentors had higher self-esteem and life satisfaction.

These findings are also similar to Hurd and Zimmerman (Hurd & Zimmerman, 2013), who found that natural mentoring relationships with high levels of closeness and either extended duration or frequent contact significantly improve life satisfaction and depression. On the other hand, this finding is contrary to several natural mentoring studies that found non-familial mentors to be more beneficial for youth than familial mentors (Darling et al., 2003; DuBois & Silverthorn, 2005a; Hurd et al., 2014). These studies propose that having a mentor outside of the family may expose the mentee to alternative perspectives, behaviors, experiences, and resources (DuBois & Silverthorn, 2005a). By going beyond the social role of the mentor and using several relationship characteristics to empirically derive underlying classes of natural mentors, the current study highlights the fact that permanent family mentors may be the most beneficial because they are also those with the longest relationship, most frequent contact, and high levels of closeness.

Impact of Latent Class Membership Differs by Sexual Orientation

The current study found sexual orientation-based differences in the associations between latent class membership and two outcomes: self-esteem and drinking-related problems. In addition to the positive relationship between high self-esteem and

permanent family mentors versus past school or distant family mentors, heterosexual youth are also more likely to have high self-esteem if they have a permanent family mentor compared to a newfound community mentor. This relationship was not significant for sexual minority youth. This may be a result of the small sample of sexual minority youth with natural mentors. Still, it is interesting to note that sexual minority youth actually have higher odds of having high self-esteem if they have a newfound community mentor than a permanent family mentor. This opposing association might explain why, when looking at all youth together, this relationship was only approaching significance.

Although these data do not allow for examining differences based on the sexual orientation identity of the mentor, it is possible that newfound community mentors for sexual minority youth are part of the LGBT community and are able to help guide them and offer advice that increases their self-confidence as a sexual minority. Alternatively, given that this is a cross-sectional study, it is also conceivable that sexual minority youth who have higher self-esteem are more likely to be involved in events and activities that connect them to newfound community mentors. Given the inconsistent findings and lack of statistical significance, future research is needed to better understand these relationships.

The current study also found that, for sexual minority youth only, having a permanent family or school mentor, compared to having a newfound community or distant family mentor, decreases the odds of having drinking-related problems. There were no significant relationships found for heterosexual youth. While a newfound community mentor may increase a sexual minority youth's self-esteem, they may also provide access to resources or activities that increase alcohol use and abuse. Likewise,

distant family mentors most likely do not provide the guidance and advice that permanent family or school mentors offer. As discussed below, school-related mentors may be especially important and influential for sexual minority youth during adolescence. Although they no longer have a close relationship, these supportive adults may have a strong effect on youth's choices and actions related to drinking behaviors in young adulthood.

Sexual Minority Youth Lack Permanent Family Mentors

Sexual minority resiliency research has shown that family support is particularly critical to positive youth development (Bouris et al., 2010; Bregman et al., 2012; Eisenberg & Resnick, 2006; Padilla et al., 2010; Pearson & Wilkinson, 2012; Rosario et al., 2014; Ryan et al., 2010). However, most of these studies have concentrated on the role of parental/caregiver support (Bouris et al., 2010; Padilla et al., 2010; Ryan et al., 2010). The findings from the current study point to the importance of support from non-parental familial adults, especially family that has been in a youth's life for a long period of time and with whom they have frequent contact and feel emotionally close. Findings from the current study show, however, that sexual minority youth are less likely to have this type of mentor when compared to heterosexual youth. Sexual minority youth are instead more likely to have a past school mentor. In fact, when compared to heterosexual youth, they have significantly higher odds of having a past school mentor than a permanent family mentor, a newly-engaged family mentor, and a newfound community mentor. This adds to Johnson and Gastic's (2015) recent finding that sexual minority, versus heterosexual youth, are more likely to have school-related mentors and less likely to have family mentors.

As past school mentors have low item-response probabilities for current relationship quality – perceived closeness, contact, and longevity – this finding supports and deepens our understanding of the previous finding that sexual minority youth perceive less closeness in their relationships. Unfortunately, the current study cannot answer the question of *why* sexual minority youth are more likely to have past school mentors. We can form some initial hypotheses from our understanding of the minority stress theory, although future research is needed.

According to minority stress theory, the addition of minority-specific stressors to the general stressors of adolescence drives the significant health disparities between sexual minority and heterosexual youth. Empirical evidence shows the high rates of victimization that sexual minority youth experience, especially within the school environment (Russell et al., 2014). A recent study of pooled population-based data from across the United States showed that sexual minority youth reported more fighting, skipping school because they felt unsafe, and having property stolen or damaged at school than heterosexual youth (Russell et al., 2014). In the most recent Gay, Lesbian & Straight Education Network (GLSEN) bi-annual National School Climate Survey, 74% of LGBT students reported that they were verbally harassed in the past school year, 36% were physically harassed (e.g., pushed or shoved), and 16% were physically assaulted (e.g., punched, kicked, or injured with a weapon) (Kosciw et al., 2014). Given these high rates of victimization, school-related mentors may be especially important for sexual minority youth.

In fact, the 2013 National School Climate Survey also found that LGBT students with supportive school staff (in comparison to those with no supportive staff) were less

likely to feel unsafe (36% vs. 74%); less likely to miss school because they felt unsafe or uncomfortable (15% vs. 50%); and felt more connected to their school community (Kosciw et al., 2014). Additional research shows that school-related mentors help sexual minority youth by buffering the effects of bullying victimization (Darwich et al., 2012; Gastic & Johnson, 2009; Goodenow, Szalacha, & Westheimer, 2006; Seil et al., 2014). For example, Goodenow et al. (2006) found that sexual minority youth that perceived school staff support were less likely to have been threatened at school and to have made multiple suicide attempts in the past year than those who did not perceive school staff support. Furthermore, even when victimization was taken into account, perceived school staff support still acted as a significant protective factor against suicide attempts (Goodenow et al., 2006). Similarly, Darwich et al. (2012) found that school-related adult support directly, and indirectly via sexual orientation victimization, contributed to lower school avoidance and substance use. While this relationship was found for all youth, the impact of adult support on school avoidance and substance abuse varied across sexual orientation groups, with the largest effect for lesbian, gay, and questioning youth (Darwich et al., 2012).

During the adolescent years, positive and emotionally supportive relationships serve an important role in helping sexual minority youth to healthily develop and integrate their sexual orientation identities (Rosario, Schrimshaw, & Hunter, 2008). Rosario et al. (2008) define identity integration as comfort with one's sexual orientation, disclosure to others, positive attitudes towards sexual minorities, and involvement in LGB-related social activities. By helping them through what can be an internally and externally difficult process, school-related mentors may become more salient for sexual

minority youth as they develop their sexual orientation identities.

The minority stress theory points out that the formation and integration of one's sexual orientation identity can also lead to positive factors, such as individual and group coping resources (Meyer, 2003). It is possible that sexual minority youth who are involved with a school-based LGBT support group, such as a gay-straight alliance (GSA), may be more likely to form a close, mentorship relationship with a school-related adult. In fact, Walls, Kane and Wiseneski (2010) found that students in schools with a GSA, as compared to those in schools without a GSA, were more likely to report that school-related adults were supportive of LGB students (52% versus 37%).

Still, the current study findings show that while sexual minority youth receive the benefit from a strong mentor while they are in high school, many are left without a strong relationship with an adult after adolescence. Having a long-lasting and close relationship with a non-parental adult, especially a permanent family mentor can be critical to healthy outcomes during the transition to adulthood. Although not tested in the current study, we can hypothesize several reasons for why sexual minority youth may be less likely than heterosexual youth to have permanent family mentors.

First, it could be simply that the time youth spent developing a relationship with a school mentor during adolescence may have taken time away from developing a close relationship with a non-parental family member. Research has shown that the length of the relationship and frequency of contact are important factors in developing a close relationship (Grossman & Rhodes, 2002; Hurd & Zimmerman, 2013). Without this basic accumulation of hours spent together, sexual minority youth may have missed the opportunity to develop permanent family mentors from childhood and throughout

adolescence.

Another reason why sexual minority youth are less likely to have permanent family mentors is that many sexual minority youth fear, and experience, parental rejection after disclosure of their sexual orientation (Diamond et al., 2011; Ryan et al., 2009; Savin-Williams & Ream, 2003). Research indicates that as many as 52% of parents may initially react negatively to their child's same-sex attraction disclosure (D'Augelli, Grossman, & Starks, 2008). These initial negative reactions range from disbelief and denial to intolerance and rejection. Although many youth fear disclosure to parents because of negative reactions, disappointment, and loss of the relationship, Savin-Williams and Ream (2003) found that only 1 in 20 youth reported that their relationship with their parent decreased in quality after disclosure (Savin-Williams & Ream, 2003).

Unfortunately, there are still youth who do suffer from rejecting or physically aggressive parental reactions. These negative reactions can sometimes result in extreme outcomes such as suicide (Diamond et al., 2011) and homelessness (Corliss, Goodenow, Nichols, & Austin, 2011). Research has shown that sexual minority youth are 4 to 13 times more likely (dependent on sexual orientation category) to experience homelessness than their heterosexual peers (Corliss et al., 2011). A recent national study of homeless LGBT youth found that 46% of youth run away, and 43% are forced out of their home because of family rejection (Durso & Gates, 2012). Given their fear of, or actual, parental rejection, youth may also be hesitant to disclose their sexual orientation to other family members. This might be because the youth supposes that they have similar beliefs about sexual minorities, and therefore will have an equivalent reaction to disclosure. Additionally, they may fear that disclosing to a non-parental family member may

ultimately lead to indirect disclosure to their parents.

Regardless of disclosure reaction from these family members, those youth living out of the home because they ran away or were kicked out may experience distance and loss of relationship with these important adults. Even if youth are not kicked out or run away from home, many sexual minority youth experience strained parental relationships that lead to increased substance abuse and mental health issues (Diamond et al., 2011; Needham & Austin, 2010; Pearson & Wilkinson, 2012). This may result from the heteronormative assumptions and expectations often found within the family context (Pearson & Wilkinson, 2012). It is noteworthy that sexual minority youth grow up and form their sexual identities in families that often have a dissimilar sexual orientation. This is very different from the experiences of youth with other socially stigmatized identities, like racial/ethnic minorities, who can receive support and protection from family members who share their stigmatized status.

Stressed parental relationships may translate into less attachment and confidence in relationships with the entire family system. This can be an extremely isolating experience. During adolescence, school is another prominent system in which a youth interacts; so, even though they may withdraw from their family system, sexual minority youth can turn to school-related mentors for support. However, as they transition to adulthood, ties to these important adults weaken and they are left again with the isolation and lack of support from long-term, established relationships within their families. Given the saliency of permanent family mentors to mental health outcomes, attention in research, policy, and practice should be focused on strategies for increasing acceptance and support from non-parental familial adults in the lives of sexual minority youth.

Policy & Practice Implications

It is noteworthy that the current study found that sexual minority and heterosexual youth benefit similarly from the presence and specific characteristics of natural mentoring relationships. Because sexual minority youth often face significantly more mental health and substance abuse risks than heterosexual youth, we need a higher percentage of sexual minority youth with close natural mentors. Working to increase close relationships with natural mentors among sexual minority youth may be a valuable place to intervene. Furthermore, the results suggest that targeting non-parental adult family members might be most beneficial. Two ways that this can be accomplished include: 1) individual and family-based interventions led by social work clinicians; and 2) school-based interventions within already established sexual minority support groups.

Clinicians who are working with sexual minority youth are likely to initially evaluate the risks that the youth faces, both general and minority-specific. It is also important that a clinician assess those resilience resources that are already present, or have the possibility to be cultivated, to help buffer these risks. Natural mentoring relationships should be one of the resilience resources that are initially assessed when working with sexual minority youth. Additionally, the current study's findings point to the need not only to assess for the presence of a natural mentor, but also gain an understanding of specific characteristics of the relationship. In order to do this assessment most effectively, the importance of natural mentoring relationships for sexual minority youth must be included in social work training. This training should include not only acknowledging the benefit of the presence of a natural mentor, but also the characteristics of relationships, especially those that might best serve the youth.

Once a clinician assesses a youth's social network, they must then help in developing and strengthening those relationships that will be most beneficial. Assisting youth in building social capital can be critical to their future success in navigating emerging adulthood and adulthood. The current study suggests a larger call to bridge the binary emphasis on either individual or community social work practice. Rather, clinicians can work with a youth to not only identify those within their social network that have the potential to be natural mentors, but also assist in cultivating those relationships to ensure that they are close and enduring supports throughout adolescence and into their transition to adulthood.

In light of the current study, it is especially important for clinicians working with sexual minority youth to help them identify family members who might already act as a natural mentor, or those who might best be positioned to develop into a close mentoring relationship. If not already close, clinicians can address concerns a youth might have in reaching out to their family member, which might include the fear of rejection or parental disclosure. It could be helpful for clinicians to include these family members in the work they are doing with the individual youth to assist in building the relationship. Suggesting activities to do together and frequent contact may be additional strategies to increase closeness in the natural mentoring relationship.

As mentioned previously, the development of natural mentoring relationships might work best within already established programs that target sexual minority youth. Gay-Straight Alliances, or GSAs, may be an appropriate and particularly useful vehicle to deliver a program that helps to cultivate and strengthen permanent family mentoring relationships. GSAs are school-based clubs that aim to provide a safe environment for

sexual minority youth and their allies. Additionally, cultivating these natural mentoring relationships with family members during the school years will provide time for the dyad to develop a close bond that will continue through the transition to adulthood.

GSAs are often student-led with a teacher or school-related adult advisor. Fifty percent of students have a GSA, or related student club, available at their school and two-thirds report participating (Kosciw et al., 2014). Although they have a similar mission, GSAs are not uniform across schools; they provide various types of support ranging from socializing to advocacy (Poteat, Scheer, Marx, Calzo, & Yoshikawa, 2015). GSAs may be particularly useful for promoting permanent family mentors because youth may already have a trusting relationship with a school-related mentor who is involved with the GSA. Additionally, this is a space in which they feel comfortable and supported by both adults and peers. This can help youth to feel more at ease when first developing their relationship with a family member.

An example of a way that a GSA might promote these mentoring relationships would be to host family-nights at the school where a youth can invite a non-parental adult family member, or coordinate group social activities in the community. In this way, these would be informal activities of the GSA. Another approach could be to develop a more formal youth-initiated mentoring program that is embedded within the GSA. Youth-initiated mentoring is an emerging approach to mentoring that offers a hybrid of program-based mentoring and natural mentoring (Schwartz, Rhodes, Spencer, & Grossman, 2013). In youth-initiated mentoring, the youth nominates a non-parental, adult mentor from within their existing social network. A program-based model then provides support in developing the mentoring relationship, especially support for the adult mentor.

Developing a youth-initiated mentoring program within a GSA may be a particularly effective intervention for sexual minority youth, as it provides an avenue for school-related staff or clinicians to work with important adults in the youth's life that they may otherwise risk loosing, or be fearful of the risk, after disclosure of their sexual orientation. As this is a new strategy for promoting healthy development and increasing resilience among sexual minority youth, it will be critical that school, state, or federal policies provide funding for the completion of a rigorous evaluation to determine the program's effectiveness and establish evidence-based practice.

While practice implications are critical to helping sexual minority youth experience healthy development in the face of societal oppression and discrimination, it is these broader issues that we will ultimately have to address in order to eradicate sexual orientation disparities. Numerous studies have shown that policies at the school level, as well as in the broader society, have an impact on several health and educational outcomes (Hatzenbuehler, 2011; Hatzenbuehler, Birkett, Van Wagenen, & Meyer, 2014; Heck et al., 2011; Poteat et al., 2012). Federal, state, and school policies that help to create a more welcoming and just environment for sexual minorities are critical to prevention and societal change efforts. These include hate crime protections, anti-bullying policies, employment nondiscrimination, and marriage equality. As Mustanski et al (2014a) note, only helping sexual minority youth to cope and adapt to adversity does not equate to health equality.

Limitations & Future Research

Although the current study adds to our knowledge of social support as a protective factor for sexual minority youth against poor mental health and substance

abuse outcomes, as well as natural mentorship among diverse populations, there are a few limitations to keep in mind. The current study is cross sectional; causality cannot be inferred. In other words, the questions about natural mentors are retrospective, and we are not able to determine temporal sequencing of the initiation of the mentoring relationship and mental health and substance abuse outcomes. Sexual orientation identity was only asked at Wave III; we do not know exactly when the youth first identified as a sexual minority, nor do we know their level of disclosure. Also, we do not know whether the mentoring relationship happened prior to, or after a youth first identified their sexual minority status. Finally, given that these are self-report, retrospective responses, they are subject to recall bias.

Prospective studies that follow sexual minority youth and their mentors in adolescence and through the transition to adulthood would provide a more rigorous design in which to begin to understand causal relationships. A longitudinal study would also provide an opportunity to explore pathways through which natural mentors have an effect on sexual minority youth, and how this might compare with heterosexual youth. For example, several recent studies found that natural mentors have an effect on educational attainment for African American adolescents via increased positive racial identity, increased social skills, and emotional development (Hurd et al., 2012; Hurd & Sellers, 2013). Additional studies found that support from important others, including peers, and increases in coping skills and life purpose mediated the effect of natural mentors on mental health and substance abuse outcomes (Hurd et al., 2014; Hurd & Zimmerman, 2013). These studies, along with Rhodes (2005) developmental model of

youth mentoring relationships provide a framework in which to begin comparing the pathways of influence of natural mentors for sexual minority and heterosexual youth.

Another limitation of the current study is that the data do not provide specific information about the youths' experiences with either proximal or distal discrimination and victimization. While the minority stress theory (Meyer, 2003) informs the current study, sexual minority status was used as a proxy for these minority-specific stressors. However the current study recognizes that sexual minority youth confront varying levels of minority specific stressors, and sexual minority status alone is not the cause of mental health and substance abuse disparities. Interestingly, Schwartz and Meyer (2010) note that there is an advantage to using social status as a proxy for social stress: it allows one to measure structural constraints that may not necessarily be experienced or recognized by an individual as stressful. Still, they emphasize the importance of testing the full mediation model implied in the basic social stress theory to avoid arriving at flawed inferences (Schwartz & Meyer, 2010). Future research about the impact of natural mentors for sexual minority youth must measure and control for experiences of specific stressors, both minority specific and general stressors of adolescence.

Unfortunately, the data also do not provide much demographic information for the mentors, most importantly, their sexual orientation. Therefore, we cannot identify these matched characteristics, which preliminary research has found to have conflicting effects for sexual minority youth (Bird, Kuhns, & Garofalo, 2012; Russell & Horne, 2009; Torres et al., 2012). Additionally, the questions were only asked of the youth, with no information provided from the mentee's perspective. There are currently no studies to the author's knowledge that consider both the mentee and mentor's perspectives when

exploring the role of natural mentoring relationships for sexual minority youth. In this way, the research would benefit not only from examining matched demographic characteristics of the mentor and mentee, but also whether the mentor and mentee's perception of the relationship is similar.

There is one other particularly fertile area for future research to deepen our understanding of natural mentors among sexual minority youth, which the current study was not able to address: the intersection of sexual orientation and racial/ethnic identities that youth must navigate in adolescence and their transition to adulthood. Recent research has shown that there is a protective effect for sexual minorities who identify as African American (Bostwick et al., 2014; Burns, Ryan, Garofalo, Newcomb, & Mustanski, 2015; Russell et al., 2014). Bostwick and colleagues (2014) hypothesize that salient racial identities and experiences of racism may help buffer negative health outcomes related to sexual orientation identities.

The current study did find that Black youth (in comparison to White youth) are significantly more likely to have a permanent family mentor than a school mentor. This means that White sexual minorities have the lowest probability of having a permanent family mentor in the transition to adulthood. It could be that for Black sexual minority youth, a greater number of strong and stable permanent family mentors are an additional protective aspect of their racial identity. Although this is an important and emerging area of interest within the sexual minority research field, further analysis was outside the scope of the current study. Additionally, given the substantial number of tests of significance already in the current study, adding higher-level interactions would further increase the possibility of Type I errors. Future research should examine differences in

natural mentoring relationships and outcomes based on race/ethnicity, both within sexual minority populations and between sexual minority and heterosexual youth.

Finally, the current study did not control for individual characteristics that might contribute to a youth's ability to form a relationship with a natural mentor. Rhodes' (2005) developmental model of youth mentoring points to multiple youth characteristics that may influence the development and effect of mentoring relationships, such as social competencies and interpersonal histories. For example, the level of past social support received from parents and peers may impact youth's social skills and ability to ask for help, thus affecting the likelihood of forming a close relationship with a non-parental adult. In fact, Zand and colleagues (2009) found that stronger family and school bonds were positively associated with high quality relationships with mentors.

Keller (2005) expanded Rhodes' (2005) model by stressing the complex network of interdependent relationships, including the youth, mentor, parent/guardian, and program caseworker, that have an effect on outcomes in formal mentoring relationships. When considering natural mentoring relationships, certain combinations of support from parents, friends, and natural mentors could have a significant effect on mental health and substance abuse outcomes for sexual minority youth. Findings from the current study demonstrate the utility of using latent class analysis to understand the multi-dimensional nature of natural mentoring relationships. This may also be true when considering the multiple people who provide support in a youth's life. Rather than examining the unique effect of each supportive person, future research should conduct a latent class analysis to identify underlying classes based on levels of parental, peer, and natural mentor support.

This will provide a much richer understanding of social support as a resilience resource for sexual minority youth.

Conclusion

The current study is one of only a handful of studies to examine the role of natural mentors for sexual minority youth. As discussed in chapter two, natural mentors are an important form of social support for youth during adolescence and the transition to adulthood. With the large body of evidence showing significant and persistent sexual orientation disparities among youth, it is time for the overall field of mentoring research to turn their attention to this vulnerable and marginalized population.

The current study accomplishes this by using a large, nationally representative sample to explore whether natural mentors differentially impact mental health and substance abuse outcomes for sexual minority and heterosexual youth. Rigorous variable and person-centered analytic methods were utilized to examine the effect of the presence and characteristics of natural mentoring relationships on a range of outcomes, including depression, suicide ideation, self-esteem, life satisfaction, marijuana and illicit drug use, binge drinking, and drinking-related problems.

Findings show that simply having a natural mentor is only associated with positive mental health outcomes. However, having a *close* natural mentoring relationship has a significant relationship with several outcomes, including decreased depression, suicide ideation, and binge drinking, and increased self-esteem and life satisfaction. This relationship is similar regardless of sexual orientation identity. It is not surprising therefore, that permanent family mentors – relationships high in perceived closeness, contact, and longevity – are the empirically derived class of natural mentoring

relationships that have the greatest impact on outcomes for all youth. What is troubling is that sexual minority youth, when compared to heterosexual youth, are less likely to have the benefit of permanent family mentors. Rather, they are more likely to have mentors from high school. While past school mentors protect against drinking-related problems for sexual minority youth, they lack closeness with adult support as they transition into adulthood.

This finding makes an important contribution to the social work field, as it provides a starting point for developing interventions that may help to reduce sexual orientation disparities in mental health and substance abuse outcomes. Chapter five provides several suggestions for both individual and school-based interventions that focus on developing and maintaining long-term relationships with familial, non-parental adults for sexual minority youth. At the same time, the current study cautions against using the current results as a basis for devoting fewer resources to fostering mentoring relationships between youth and school-related adults. In fact, the school may be an especially fruitful place for intervention work because one can capitalize on the already-established school-related mentoring relationships and evidence-based programs, such as GSAs.

Results from the current study also extend our knowledge regarding resiliency among sexual minority youth, as well as filling a gap in the broader adolescent literature on mentorship among vulnerable populations. Although the current study did not find that natural mentoring relationships differentially impact sexual minority and heterosexual youth, there are significant distinctions in the types of mentors that they experience. Future research is needed to understand these relationships in more depth.

In particular, while the current study tried to draw conclusions about classes of natural mentoring relationships, we do not know if latent class membership significantly mediates the relationship between sexual orientation and mental health and substance abuse outcomes. Latent class analysis with mediation is an emerging area of research, without a current statistical model for accurately testing for an indirect effect within the latent class model. Still, knowing that all relationships are dynamic and multidimensional, mentoring research using person-centered techniques is an especially appropriate and possibly more accurate analytic method. It will be important to continue to use these person-centered techniques as more rigorous ways of testing latent class analysis with mediation develop.

While the current study makes a significant contribution to social work research and clinical practice, it would be imprudent to end without stressing the importance of larger societal change that this study evokes. The results of the current study show that although close natural mentors have a significant association with decreased mental health and substance abuse outcomes, substantial sexual orientation disparities persist. Learning to cope with social support from natural mentors is not enough; it is critical to address the minority stressors in our society that actually lead to sexual orientation disparities in order to thoroughly address the issue. The current study emphasizes the important role that social workers play in the lives of sexual minority youth. They can assist youth in developing natural mentors as a resilience resource that can help them thrive in spite of the oppression and discrimination they face. At the same time, they must also advocate and support change in federal, state, and school policies to create a more welcoming and just environment for all sexual minority youth.

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APPENDIX A: Minority Stress Theory (Meyer, 2003)
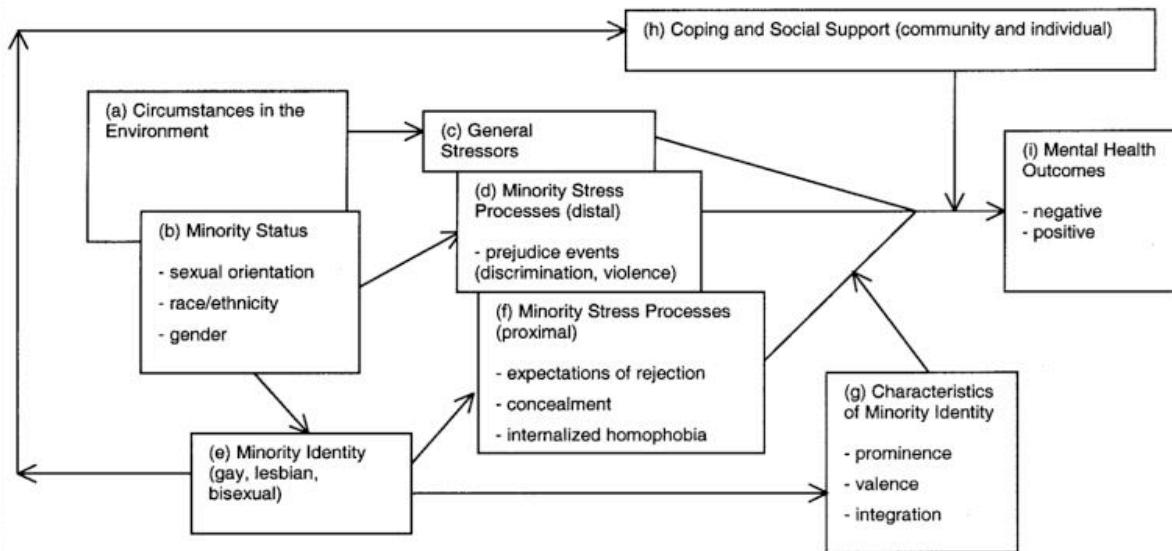
APPENDIX B: Developmental Model of Youth Mentoring (Rhodes, 2005)