CHAPTER 5

Sex, Sexual Orientation, and Depression

Mark L. Hatzenbuehler *and* Katie A. McLaughlin

AQ: In TOC the order of the authors is "Katie A. McLaughlin and Mark L. Hatzenbuehler" Please confirm which one is correct?

Abstract

Females and lesbian, gay, and bisexual (LGB) populations are twice as likely to develop depression as males and heterosexuals, respectively. This chapter reviews the descriptive epidemiology of sex and sexual orientation differences in depression, and discusses explanations for these group differences, including neurobiological (e.g., differences in limbic system reactivity), individual (e.g., cognitive and affective processes), and interpersonal processes (e.g., victimization experiences), as well as structural influences (e.g., state-level policies that differentially target gays and lesbians for social exclusion). The chapter summarizes common vulnerabilities to depression in females and sexual minorities and offers several directions for future research, including the need for multimethod, multilevel approaches that can increase our understanding of the emergence and persistence of differences in depression based on sex and sexual orientation.

Key Words: sex differences, sexual orientation, group differences, cognitive/affective processes, neurobiological processes, interpersonal processes, structural influences

According to the World Health Organization (2008), depression is the leading cause of disability among any disease or illness. Depression is not uniformly distributed in the general population, however. Females (Nolen-Hoeksema & Hilt, 2009) and sexual minorities[1] (Meyer, 2003) are twice as likely to suffer from depression as males and heterosexuals, respectively. In this chapter, we describe the epidemiology of differences in depression based on sex and sexual orientation, with a focus on differences in lifetime prevalence, age of onset, and persistence/chronicity. We also review explanations for these differences. We take a "cells-to-society" approach, describing factors that range from neurobiological influences (e.g., hormones, differences in limbic system reactivity) to structural influences (e.g., state-level policies that differentially target gays and lesbians for social exclusion). We conclude by summarizing common vulnerabilities to depression in females and sexual minorities and offer directions for future research.

Epidemiology of Major Depression by Sex and Sexual Orientation

A number of epidemiological studies of depression have been conducted in large, representative samples of the United States and other countries, including the National Comorbidity Survey (NCS) and Replication (NCS-R), the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), and the World Mental Health (WMH) Surveys. In this section, we review evidence concerning differences in depression based on sex and sexual orientation in three domains: (1) the lifetime prevalence of depression; (2) the age of onset/developmental trends of depression; (3) and the persistence/chronicity of depression.

Lifetime Prevalence

One of the most consistent findings in the psychiatric epidemiological literature is the 2:1 sex difference in the lifetime prevalence of depression;

women are diagnosed with depression at twice the rate of men in adulthood (Kessler et al., 2003). Although the lifetime prevalence of depression varies cross-culturally, women exhibit higher rates of depression compared to men across cultures as well as across sociodemographic groups within cultures (Weissman et al., 1996). Epidemiological studies in the United States suggest that major depression will affect one out of four women and one out of eight men in their lifetimes. For example, the NCS-R reported a lifetime prevalence of major depressive disorder as 21.3% for women and 12.7% for men (Kessler et al., 2003). The NESARC reported slightly lower, but similar lifetime prevalence rates: 17.1% for women and 9.0% for men (Hasin, Goodwin, Stinson, & Grant, 2005). Although the 2:1 sex difference in depression has remained constant over many years, the lifetime prevalence of major depression has increased in both men and women in more recent cohorts (Kessler et al., 2003).

Recent epidemiological research has also indicated that sexual minorities are at increased risk for psychiatric morbidity across a wide spectrum of outcomes, including major depression (for a meta-analysis, see King et al., 2008). These disparities in depression appear to be most pronounced among gay men, who have been found across numerous studies to have a higher lifetime prevalence of *DSM*-diagnosed major depression (Cochran & Mays, 2000; Cochran, Mays, & Sullivan, 2003; Gilman, Cochran, Mays, Ostrow, & Kessler, 2001) than heterosexual men. Although some studies have shown higher rates of depression in sexual minority women compared to heterosexual women (e.g., Gilman et al., 2001), others have shown no statistically significant group differences (e.g., Cochran et al., 2003), which may in part be due to low statistical power given the small sample sizes of sexual minorities in most population-based studies.

Age of Onset/Developmental Trends

The prevalence of major depression varies markedly across the life-course. A meta-analysis of depression in youth reported that the prevalence of depression is only 2.8% in children under the age of 13 years and increases to 5.6% in adolescents aged 13–18 years (Costello, Erkanli, & Angold, 2006). By adulthood, the lifetime prevalence of depression is 16.2% with 6.6% of adults experiencing a major depressive episode in a given 1-year period (Kessler et al., 2003). The incidence of depression remains relatively low until about 11 years of age and rises most dramatically between ages 15 and 18 years (Hankin et al., 1998; Kessler et al., 2003). Although the prevalence of childhood depression is similar for boys and girls, females are more likely than males to develop depression beginning at age 13 years (Hankin et al., 1998; Nolen-Hoeksema & Girgus, 1994). The risk for depression then remains elevated among females relative to males throughout adolescence and adulthood (Kessler et al., 2003; Kim-Cohen et al., 2003). By age 18 years, the 2:1 sex difference is apparent; it remains stable throughout adulthood (Eaton et al., 1997). (For a further discussion of the emergence of sex differences in depression during adolescence, see Hilt & Nolen-Hoeksema, 2009.)

In recent studies using nationally representative or community-based samples, sexual minority adolescents have been found to be at elevated risk for depressive symptoms and major depression compared to their heterosexual peers (e.g., Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008; Russell & Joyner, 2001). Depressive symptoms may also emerge earlier in the life-course among sexual minorities relative to heterosexuals. For instance, two studies from general population samples have shown that sexual minority men had an earlier age of onset of major depression than heterosexual men (Cochran & Mays, 2000; Gilman et al., 2001).

Persistence/Chronicity

Sex differences in major depression episodes could reflect the fact that women are more likely to experience first onsets, longer depressive episodes, a greater risk of recurrence of depression, or all of these. Data from several studies of adults (e.g., Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993) and children or adolescents (e.g., Hankin et al., 1998), however, indicate that the sex difference in depression is explained by a greater proportion of first onsets in girls and women compared to boys and men, and not to longer durations or greater recurrence.

As previously mentioned, sexual minorities are already at higher risk for depression than their heterosexual peers during adolescence. In turn, adolescents who have experienced a major depressive episode are at a pronounced risk for recurrent problems with depression and for relapse in adulthood (e.g., Lewinsohn, Rhode, Klein, & Seeley, 1999). Using data from the National Health and Nutrition Examination Survey-III (NHANES III), Cochran and Mays (2000) found that sexual minority men

experienced greater recurrent depression than heterosexual men. Moreover, data from the NCS indicated that sexual minorities had numerically elevated odds (ORs = 1.6 for men and 3.1 for women) for persistence of major depression relative to heterosexuals, although the differences did not reach statistical significance. Thus, the extent to which sexual minorities are at elevated risk for disorder severity, including persistence, warrants greater attention in future research.

Explanations of Group Differences in Depression

Many different explanations of these group differences in depression have been proposed. In this section, we adopt a multilevel approach to examining potential explanations for these differences, reviewing evidence for risk factors for depression, including biological (e.g., hormones, differences in limbic system reactivity), cognitive/affective (e.g., rumination), interpersonal (e.g., rejection sensitivity, victimization/abuse), and structural (e.g., social conditions and institutional policies) levels. Although a comprehensive review of each of these potential explanatory factors is beyond the scope of this chapter, we refer the reader to more comprehensive reviews of the literature on depression in women and men (Hyde, Mezulis, & Abramson, 2008; Nolen-Hoeksema & Hilt, 2009) and on mental health in sexual minorities and heterosexuals (Hatzenbuehler, 2009; Meyer, 2003) for more thorough discussions of different explanations.

Neurobiological Explanations

A variety of neurobiological factors might underlie sex differences in the emergence of depression during adolescence. Early pubertal onset has been associated with an elevated risk for adolescent depression among females in multiple studies (Graber et al., 2007; Graber, Nichols, & Brooks-Gunn, 2010). Determining whether the biological factors that lead to early pubertal onset play a role in explaining the sex difference in depression incidence during adolescence represents an important goal for future research. Moreover, although the consistently documented association between early pubertal timing and depression risk in females might reflect underlying neurobiological vulnerability, the pathways linking pubertal onset and depression also involve a variety of psychosocial factors. For example, poor-quality family, peer, and romantic relationships are both a predictor and consequence of early pubertal onset. Stressors in the family environment, such as low-quality family interactions or father absence, are thought to contribute to early pubertal onset; conversely, early maturing girls have lower-quality relationships with family and peers and are at a higher risk for physical and verbal abuse from romantic partners (Graber et al., 2010). The combination of early pubertal timing and subsequent stressful life events, particularly peer stressors, is associated with an elevated risk for depression (Conley & Rudolph, 2009; Ge, Conger, & Elder, 2001). The relationship between early puberty and depression in females may also be mediated by self-esteem and body dissatisfaction (Negriff & Susman, 2011; Stice, Presnell, & Bearman, 2001).

Adolescence is characterized by marked increases in physiological reactivity to stress, both in the hypothalamic–pituitary–adrenal (HPA) axis and in the autonomic nervous system (Stroud et al., 2009). This increase in stress reactivity occurs to a greater degree for female adolescents as compared to males (Stroud, Papandonatos, Williamson, & Dahl, 2004). Stressful life events, particularly chronic stressors occurring in interpersonal domains, can lead to dysregulation in physiological stress response systems (Gunnar & Quevedo, 2007). Evidence suggests that female adolescents experience higher levels of interpersonal stressors than males, particularly in peer and family domains (Rudolph & Hammen, 1999). As these systems become more attuned to the social environment in adolescence, interpersonal stressors might be particularly likely to alter stress response system functioning in females, elevating the risk for major depression. Dysregulated cortisol regulation has been observed in depressed youths, with the most commonly reported pattern involving elevated evening cortisol levels (Goodyer, Park, & Herbert, 2001; Lopez-Duran, Kovacs, & George, 2009). The degree to which this dysregulation is a precursor to or consequence of depression itself remains unclear, although in a prospective study elevated cortisol-to-dehydroepiandrosterone (DHEA) ratio (a measure of anabolic balance) predicted major depression onset in a high-risk adolescent sample (Goodyer, Herbert, & Tamplin, 2003).

By adulthood, few neurobiological factors have been identified that might contribute to sex differences in the risk for major depression. Women exhibit greater limbic system reactivity to stress as compared to men, who exhibit greater activation in regions of the prefrontal cortex following stressors (Wang et al., 2007). Sex differences in serotonin synthesis in the brain have also been documented (Nishizawa et al., 1997), but their role in underlying

differences in depression is unknown. Finally, it has been suggested that genetic vulnerabilities to depression operate differently for males and females, such that certain genetic polymorphisms are associated with depression among females but not among males (Eley et al., 2004), although evidence for such differences is inconsistent across studies. Taken together, evidence for neurobiological factors underlying sex differences in depression is stronger during adolescence than adulthood.

Just as biological explanations of sex differences have focused on putatively immutable characteristics between men and women, so too have biological explanations of sexual orientation addressed differences between heterosexual and minority populations (for a history of these arguments, see Fausto-Sterling, 2000). Researchers have used multiple methods to pursue these putative biological differences, such as electroencephalography (EEG) and assessments of circulating androgen levels (for a comprehensive review, see Mustanski, Chivers, & Bailey, 1999). For instance, several studies have reported that gay men exhibit female-typical patterns in EEGs during spatial and verbal tasks (e.g., Wegesin 1998). Similarly, some studies of finger length ratio (e.g., Williams et al., 2000) have reported that the right hand 2D(index finger):4D(ring finger) ratio for lesbians is not significantly different from that of heterosexual men (but is significantly smaller than heterosexual women). However, these results have not always been consistent (Mustanski et al., 1999). Furthermore, in cases in which group differences have been found, researchers have rarely considered how and whether these differences may contribute to sexual orientation disparities in depression. There are some notable exceptions, including recent studies exploring sexual orientation differences in HPA axis reactivity (e.g., Juster, Smith, Ouellet, Sindi, & Lupien, 2013; Hatzenbuehler & McLaughlin, 2014), which represents an important area for future study on neurobiological risk factors that may explain group differences in depression based on sexual orientation.

Cognitive and Affective Explanations

Rumination

Rumination is defined as the tendency to think passively and brood about negative thoughts and feelings in a repetitive manner (Nolen-Hoeksema, 1991). Individual differences in people's tendency to ruminate are associated with a risk for major depression, such that higher levels of rumination predict the onset, persistence, and severity of major depressive episodes (for a review, see Nolen-Hoeksema, Wisco, & Lybomirsky, 2008). Consistent evidence indicates that beginning in adolescence females engage in rumination significantly more than males (Hankin, 2008), and this sex difference in rumination has been shown to account statistically for the sex difference in depression in multiple studies (e.g., Nolen-Hoeksema, Larson, & Grayson, 1999).

There are many possible reasons for why females have a greater tendency to ruminate than males. One is that girls are socialized to use emotion-focused coping strategies, whereas boys are socialized to cope in a more direct manner (e.g., problem solving). There is some evidence for this in observational ~~and empirical~~ work with child–parent interactions (e.g., Adams, Kuebli, Boyle, & Fivush, 1995). Another possibility is that females are more likely to experience environmental stressors that promote rumination. Indeed, conceptualizations of the sex difference in depression have often noted that women are more likely than men to experience the kinds of uncontrollable interpersonal stressors that might be especially likely to lead to rumination (e.g., sexual abuse, harassment at work) (Nolen-Hoeksema, 2001; Nolen-Hoeksema et al., 1999). It is also possible that sex differences in rumination are not the result of environmental experiences, but rather reflect innate differences in processing style or a propensity for self-reflection.

Research has also indicated that rumination is an important mechanism explaining sexual orientation disparities in depressive symptoms. In a longitudinal study of adolescents, Hatzenbuehler, McLaughlin, and Nolen-Hoeksema (2008) found that sexual minority youth were more likely than their heterosexual peers to ruminate, and group differences in rumination accounted for the higher levels of depressive symptoms among sexual minority youth. Furthermore, a daily diary study found that sexual minority young adults were more likely to ruminate on days in which stigma-related stressors (e.g., perceived discrimination) occurred; in turn, rumination statistically accounted for the relationship between these stigma-related stressors and psychological distress (Hatzenbuehler, Nolen-Hoeksema, & Dovidio, 2009).

Negative Attributional Style and Hopelessness

Negative attribution style—defined as the tendency to attribute negative events to stable

and global causes, to assume that negative events invariably lead to negative consequences, and to assume that negative events reflect internal deficits or failings (see Chapter 13)—is a cognitive factor that may contribute to the sex differences in depression (Hyde et al., 2008). Negative attributional style is strongly associated with depressive symptoms and interacts with stressful life events to predict increases in depression over time (e.g., Alloy et al., 2000). There is some evidence that adolescent girls are more likely to have a negative attributional style than boys (Hankin & Abramson, 2002). Furthermore, the relationship between a negative attributional style and depressive symptoms is stronger for adolescent girls than for boys (Gladstone, Kaslow, Seeley, & Lewinsohn, 1997), which may contribute to sex differences in depression. The degree to which cognitive vulnerability predicts depressive symptoms following interpersonal stressors, specifically peer rejection experiences, has also been found to be stronger among adolescent females as compared to males (Prinstein & Aikins, 2004). The degree to which sex differences in the associations of negative attributional style and depression persist into adulthood is unknown. In addition to rumination and negative attributional style, Hyde and colleagues (2008) suggested that women's greater tendency to attend to their bodies and to have lower body esteem as compared to men may represent an important cognitive factor in risk for female depression. Sex differences in body image and satisfaction that emerge during adolescence may therefore play a role in explaining sex differences in depression.

Although there is no research on negative attribution style as it relates to sexual orientation differences in depression, there is some research on hopelessness, a related construct. Hopelessness is defined as the belief that negative events will occur (or, conversely, that desired events will not occur) and that there is nothing the individual can do to change the situation (Abramson, Metalsky, & Alloy, 1989). Hopelessness is a potent risk factor for the onset of major depression that may contribute specifically to sexual orientation differences in depression. Studies have indicated that sexual minority adolescents are more likely to feel hopeless than their heterosexual peers (e.g., Russell & Joyner, 2001); group differences in hopelessness predicted higher rates of depressive symptoms among sexual minority adolescents relative to their heterosexual peers (Safren & Heimberg, 1999).

Interpersonal Factors

Interpersonal theories of depression highlight a variety of social behaviors that contribute to and maintain depressive symptoms, including excessive reassurance seeking, negative feedback seeking, and basing your self-worth on the opinions of others (see Chapter 51; Joiner & Coyne, 1999). In this section, we review several interpersonal factors that may contribute to differences in depression based on sex and sexual orientation. We focus in particular on those factors that are common across women and sexual minorities, including rejection sensitivity and interpersonal stressors. This necessarily selective approach will not address factors that have not yet been adequately studied with one or both groups (e.g., interpersonal orientation; Feingold, 1994).

Interpersonal Stressors

Exposure to stress is common in the lives of depressed people (Hammen, 2005). Although there is a great debate about the operationalization and measurement of stress, even studies that focused only on "independent" or fateful events that could not have been due to the individual's depression or other characteristics have shown a link between stressful life events and an elevated risk of experiencing depression (see Hammen, 2005; Monroe, 2008). Both the differences in depression between women and men, and between sexual minorities and heterosexuals, have been attributed in part to differences in exposure to stressors. Below, we discuss interpersonal stressors that may contribute to sex and sexual orientation differences in depression, with a particular focus on victimization and violence.

Females are more likely to be exposed to multiple forms of interpersonal violence than males, including rape, sexual assault, and stalking (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Tolin & Foa, 2006). Having been the victim of rape more than doubles your chances of developing depression (Burnam et al., 1988), and it is estimated that 10–15% of women have been victims of rape during their lifetime (Kessler et al., 1995). In addition to rape, other types of interpersonal victimization, such as intimate partner violence and sexual abuse, also confer a risk for developing depression (Weiss, Longhurst, &Mazure, 1999). Although boys and men are also victims of childhood maltreatment, females are more likely to experience sexual abuse than males (Finkelhor, Hotaling, Lewis, & Smith, 1990), and this may partially explain the higher rates of depression in women. For example, one review

estimated that about one-third of the sex difference in adult depression could be attributed to the higher rates of childhood sexual abuse in girls (Cutler & Nolen-Hoeksema, 1991). Other work suggests that exposure to other forms of victimization, such as intimate partner violence, might also contribute to sex differences in depression (Campbell, 2002).

Sexual minorities are also disproportionately exposed to victimization and violence relative to heterosexuals. Balsam, Rothblum, and Beauchaine (2005) found that LGB individuals experienced more forms of victimization over the life course than their heterosexual siblings. In particular, LGB participants reported more childhood psychological and physical abuse by parents and caretakers, more childhood sexual abuse, more partner psychological and physical abuse in adulthood, and more sexual assault experiences in adulthood than their heterosexual siblings. Previous studies also suggest that disproportionate exposure to physical and sexual abuse is associated with elevations in depressive symptoms among sexual minorities as compared to heterosexuals (McLaughlin, Hatzenbuehler, Xuan, & Conron, 2012).

LGB adolescents are also more likely than their heterosexual peers to be victims of peer violence (e.g., Russell, Seif, & Truong, 2001). Studies with representative samples of youth have demonstrated that these group differences in peer victimization partially account for the association between sexual orientation and risk of suicide (Russell & Joyner, 2001). It is important that future researchers determine whether peer victimization can account for disparities in depressive symptoms based on sexual orientation.

Rejection Sensitivity

Rejection sensitivity is defined as the tendency to "anxiously expect, readily perceive, and overreact to rejection" (Downey, Freitas, Michaelis, & Khouri, 1998, p. 545), and is associated with depression, particularly in the context of interpersonal stressors and relationship loss. For example, rejection sensitivity is associated prospectively with increases in depression among women who experienced a partner-initiated break-up, but not among those who initiated a break-up or experienced noninterpersonal stressors (Ayduk, Downey, & Kim, 2001). In a daily diary study, the romantic partners of women high in rejection sensitivity were more likely to experience relationship dissatisfaction when conflict arose; these rejection-sensitive women also considered their partners to be more withdrawn (Downey et al., 1998). This finding was not true of romantic partners of men high on rejection sensitivity, which suggests that the fulfillment of women's rejection expectations may have a greater impact on their interpersonal relationships than is the case for men. This study did not examine depression, but points to a potential mechanism that may contribute to higher rates of depression in women.

This research on rejection sensitivity in interpersonal contexts has been extended to examine sensitivity to status-based rejection. For example, expectations of rejection based on race impairs the functioning of African-American students across a variety of domains, including affiliation and trust within institutional settings (Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002). At least one study has linked high levels of rejection sensitivity to depressive symptoms among sexual minority men (Hatzenbuehler, Nolen-Hoeksema, & Erickson, 2008).

Structural Explanations

Social Conditions and Institutional Policies/Practices

There is a body of literature that considers gendered social structure and interactions as factors that can explain sex differences in mental disorders, including depression (e.g., Lennon, 1995; Simon, 1995). One focus of this line of work has been on chronic strain related to gender roles. Evidence from multiple epidemiological studies indicates that the benefits of marriage are greater for males than for females, and that females experience greater stress related to marriage than males (Bebbington, 1998). Women report more chronic strain related to the family, finances, parenting, and workload inequalities within marriages (Nolen-Hoeksema et al., 1999). These chronic strains partially explained the sex differences in depression in multiple studies (e.g., Nolen-Hoeksema et al., 1999). Similarly, Rosenfield (1989) documented that sex differences in depressive symptoms were no longer observed when familial demands between men and women were equal (i.e., sex differences in depressive symptoms are reduced to nonsignificance), indicating that demands are a mediator of the relationship between sex and depressive symptoms. Women are also more likely to be single parents than men, and the prevalence of depression has been found to be particularly high among unmarried women raising young children and in the postpartum period for women without a cohabiting partner (Brown &

Moran, 1997; Hobfoll, Ritter, Lavin, Hulsizer, & Cameron, 1995).

In addition to chronic strains related to gender roles, research has also focused on ways in which women's lower social status may contribute to sex differences in depression. For instance, a cross-national comparison of psychiatric disorders in 15 countries from the WMH surveys showed a significant narrowing of sex differences in major depression resulting from changes in gender ideology, including women's labor force experience, education levels, median age of marriage, and contraception use (Seedat et al., 2009). Within the United States, state-level policies related to reproductive rights have also been linked to the prevalence of major depression among women; specifically, the odds of depression are lower among women living in states with legal and policy protections of women's reproductive health rights (McLaughlin, Xuan, Subramanian, & Koenen, 2011). This association could reflect either the fact that women in these states are denied access to services they need or that these policies reflect a climate that is hostile to women's rights.

Social/structural factors are also related to depression among sexual minorities. Several studies have documented that social policies that differentially target gays and lesbians for social exclusion are strongly related to mental health outcomes in LGB populations (for a review, see Hatzenbuehler, 2010). In one study, Hatzenbuehler, Keyes, and Hasin (2009) coded states for the presence or absence of policies that confer protection to gays and lesbians—namely, hate crime statutes and employment nondiscrimination policies that include sexual orientation as a protected class. This policy information was linked to individual-level data on mental health and sexual orientation from a nationally representative survey of U.S. adults. The prevalence of psychiatric disorders was significantly higher among LGB adults living in states with policies that did not confer protection to gays and lesbians, compared to LGB individuals living in states with protective policies. For instance, sexual orientation disparities in dysthymia were not evident in states with protective policies; however, LGB adults who lived in states with no protective policies were nearly 2.5 times more likely to have dysthymia than were heterosexuals in those same states.

In a follow-up study, Hatzenbuehler, McLaughlin, Keyes, and Hasin (2010) used longitudinal data to evaluate the impact of social policies on LGB mental health. During 2004, 16 states passed constitutional amendments banning same-sex marriage. These events occurred between two waves of data collection in a nationally representative, prospective study of U.S. adults. Respondents were first interviewed in 2001 and then the same respondents were reinterviewed in 2005 following the passage of the same-sex marriage bans. This provided a natural experiment that provided researchers with the opportunity to examine changes in the prevalence of psychiatric disorders among LGB respondents who were assessed before and after the same-sex marriage bans were passed. Of relevance to the current chapter, LGB adults who lived in states that passed same-sex marriage bans experienced a 35% increase in major depression between the two waves (Hatzenbuehler et al., 2010). In contrast, LGB respondents in states without these bans experienced a 14% *decrease* in major depression during the study period. Furthermore, rates of depression among heterosexuals were largely unchanged during this period, providing evidence for the specificity of these policies to LGB populations.

Future Directions and Conclusions

Although depression is a debilitating disorder, its consequences are disproportionately experienced by certain segments of the population, including women and sexual minorities. Beginning in mid-adolescence and continuing throughout the rest of the life-course, females are more likely than males to develop major depression, with elevated risk observed specifically for first onsets of depression but not for episode persistence. Similarly, members of sexual minority groups are at an increased risk for depression compared to heterosexuals, and this disparity begins in adolescence.

We highlighted correlates and determinants of group differences in depression related to sex and sexual orientation. In particular, research has identified numerous biological, intrapersonal (i.e., cognitive/affective), interpersonal, and social/structural factors that may contribute to sex and sexual orientation disparities in the lifetime prevalence of major depression. Although this literature has provided significant insights, there is a dearth of research that examines the ways in which these multilevel factors operate together to increase the vulnerability to depression among women and sexual minorities. This lack of multilevel research may be due to the fact that depression researchers tend to focus on risk factors in isolation from their respective disciplines. Psychologists, for instance, tend to focus on neurobiological and intrapersonal factors, whereas medical sociologists and social

epidemiologists typically focus on social-structural factors. Progress in understanding the determinants of disparities in depression based on sex and sexual orientation will be advanced by developing and testing theoretical models that span the entire range of neurobiological, cognitive/affective, interpersonal, and social/structural factors that contribute to these disparities.

To address these gaps in the literature, we believe that the field would benefit from increased interdisciplinary research that applies a cells-to-society approach to investigating sex and sexual orientation differences in major depression. It is likely that social-structural factors give rise to intrapersonal and interpersonal factors that in turn contribute to depression. For instance, intrapersonal factors, such as rumination, may mediate the relationship between social-structural factors (e.g., repressive policies) and depression. Furthermore, it is possible that risk factors across levels interact synergistically to create elevations in depression. For example, gays and lesbians with greater rejection sensitivity are likely to be at a heightened risk for depression if they reside in areas with more negative social policies surrounding homosexuality. Examining these cross-level interactions raises new opportunities for interdisciplinary research on disparities in major depression. Such research will not only contribute to a more comprehensive understanding of the etiology of sex and sexual orientation differences in depression, but will also lead to the development of more effective preventive interventions that target the multilevel influences of depression.

Acknowledgments

This chapter was supposed to be written by Dr. Susan Nolen-Hoeksema, who invited us to write the chapter with her. We are deeply saddened that Susan passed away before we could begin working on the chapter. Although Susan was not able to take part in writing the chapter, her seminal ideas and scholarship on these topics inspired much of the content that is reviewed. In addition to being an outstanding scholar and leader in the field, Susan was an inspiring, generous, and insightful mentor and collaborator. We miss her terribly.

Note

1. We will use the commonly accepted term "sexual minority" to refer to lesbian, gay, and bisexual (LGB) individuals in recognition of the various ways that sexual orientation has been operationalized in the existing literature (e.g., sexual identity, sexual behavior, sexual attraction). The term "LGB" is used in those instances in which specific studies have used measures of self-identification.

References

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, *96*, 358–372.

Adams, S., Kuebli, J., Boyle, P. A., & Fivush, R. (1995). Gender differences in parent-child conversations about past emotions: A longitudinal investigation. *Sex Roles*, *33*, 309–323.

Alloy, L., Abramson, L., Hogan, M., Whitehouse, W., Rose, D., Robinson, M., . . . Lapkin, J. B. (2000). The Temple-Wisconsin Cognitive Vulnerability to Depression (CVD) Project: Lifetime history of Axis I psychopathology in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology*, *109*, 403–418.

Ayduk, O., Downey, G., & Kim, M. (2001). Rejection sensitivity and depressive symptoms in women. *Personality and Social Psychology Bulletin*, *27*, 868–877.

Balsam, K. F., Rothblum, E. D., & Beauchaine, T. P. (2005). Victimization over the life span: A comparison of lesbian, gay, bisexual, and heterosexual siblings. *Journal of Consulting and Clinical Psychology*, *73*, 477–487.

Bebbington, P. E. (1998). Sex and depression. *Psychological Medicine*, *28*, 1–8.

Brown, G. W., & Moran, P. (1997). Single mothers, poverty and depression. *Psychological Medicine*, *27*, 21–33.

Burnam, M. A., Stein, J. A., Golding, J. M., Siegel, J. M., Sorensen, S. B., Forsythe, A. B., & Telles, C. A. (1988). Sexual assault and mental disorders in a community population. *Journal of Consulting and Clinical Psychology*, *56*, 843–850.

Campbell, J. C. (2002). Health consequences of intimate partner violence. *Lancet*, *359*(9314), 1331–1336.

Cochran, S. D., & Mays, V. M. (2000). Lifetime prevalence of suicide symptoms and affective disorders among men reporting same-sex sexual partners: Results from NHANES III. *American Journal of Public Health*, *90*, 573–578.

Cochran, S. D., Mays, V. M., & Sullivan, J. G. (2003). Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. *Journal of Consulting and Clinical Psychology*, *71*, 53–61.

Conley, C. S., & Rudolph, K. D. (2009). The emerging sex difference in adolescent depression: Interacting contributions of puberty and peer stress. *Development and Psychopathology*, *21*, 593–620.

Costello, E. J., Erkanli, A., & Angold, A. (2006). Is there an epidemic of child or adolescent depression? *Journal of Child Psychology and Psychiatry*, *47*(12), 1263–1271.

Cutler, S. E., & Nolen-Hoeksema, S. (1991). Accounting for sex differences in depression through female victimization: Childhood sexual abuse. *Sex Roles*, *24*, 425–438.

Downey, G., Freitas, A. L., Michaelis, B., & Khouri, H. (1998). The self-fulfilling prophecy in close relationship: Rejection sensitivity and rejection by romantic partners. *Journal of Personality and Social Psychology*, *75*, 545–560.

Eaton, W., Anthony, J., Gallo, J., Cai, G., Tien, A., Romanoski, A., . . . Chen, L. (1997). Natural history of diagnostic interview schedule/DSM-IV major depression. *Archives of General Psychiatry*, *54*, 993–999.

Eley, T. C., Sugden, K., Corsico, A., Gregory, A. M., Sham, P., McGuffin, P., Plomin, R., & Craig, I. W. (2004).

Gene-environment interaction analysis of serotonin system markers with adolescent depression. *Molecular Psychiatry*, *9*, 908–915.

Fausto-Sterling, A. (2000). *Sexing the body: Gender politics and the construction of sexuality*. New York, NY: Basic Books.

Feingold, A. (1994). Gender differences in personality: A meta-analysis. *Psychological Bulletin*, *116*, 429–456.

Finkelhor, D., Hotaling, G., Lewis, I. A., & Smith, C. (1990). Sexual abuse in a national survey of adult men and women: Prevalence, characteristics, and risk factors. *Child Abuse and Neglect*, *14*, 19–28.

Ge, X., Conger, R. D., & Elder, G. H. (2001). Pubertal transition, stressful life events, and the emergence of gender differences in adolescent depressive symptoms. *Developmental Psychology*, *37*, 404–417.

Gilman, S. E., Cochran, S. D., Mays, V. M., Ostrow, D., & Kessler, R. C. (2001). Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey. *American Journal of Public Health*, *91*, 933–939.

Gladstone, T., Kaslow, N., Seeley, J., & Lewinsohn, P. (1997). Sex differences, attributional style, and depressive symptoms among adolescents. *Journal of Abnormal Child Psychology*, *25*, 297–305.

Goodyer, I., Herbert, J., & Tamplin, A. (2003). Psychoendocrine antecedents of persistent first-episode major depression in adolescents: A community-based longitudinal enquiry. *Psychological Medicine*, *33*, 601–610.

Goodyer, I., Park, R. J., & Herbert, J. (2001). Psychosocial and endocrine features of chronic first-episode major depression in 8-16 year olds. *Biological Psychiatry*, *50*, 351–357.

Graber, S., Hyde, J. S., & Lindberg, S. M. (2007). Body objectification and depression in adolescents: The role of gender, shame, and rumination. *Psychology of Women Quarterly*, *31*, 164–175.

Graber, J. A., Nichols, T. R., & Brooks-Gunn, J. (2010). Putting pubertal timing in developmental context: Implications for prevention. *Developmental Psychobiology*, *52*, 254–262.

Gunnar, M., & Quevedo, K. (2007). The neurobiology of stress and development. *Annual Review of Psychology*, *58*, 145–173.

Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology*, *1*, 293–319.

Hankin, B. L. (2008). Rumination and depression in adolescence: Investigating symptom specificity in a multiwave prospective study. *Journal of Clinical Child and Adolescent Psychology*, *37*, 701–713.

Hankin, B. L., & Abramson, L. Y. (2002). Measuring cognitive vulnerability to depression in adolescence: Reliability, validity, and gender differences. *Journal of Clinical Child and Adolescent Psychology*, *31*, 491–504.

Hankin, B. L., Abramson, L. Y., Moffitt, T. E., McGee, R., Silva, P., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology*, *107*, 128–140.

Hasin, D. S., Goodwin, R. D., Stinson, F. S., & Grant, B. F. (2005). Epidemiology of major depressive disorder: Results from the National Epidemiologic Survey on Alcoholism and Related Conditions. *Archives of General Psychiatry*, *62*(10), 1097–1106.

Hatzenbuehler, M. L. (2009). How does sexual minority stigma "get under the skin?" A psychological mediation framework. *Psychological Bulletin*, *135*, 707–730.

Hatzenbuehler, M. L. (2010). Social factors as determinants of mental health disparities in LGBT populations: Implications for public policy. *Social Issues and Policy Review*, *4*, 31–62.

Hatzenbuehler, M. L., Keyes, K. M., & Hasin, D. S. (2009). State-level policies and psychiatric morbidity in lesbian, gay, and bisexual populations. *American Journal of Public Health*, *99*, 2275–2281.

Hatzenbuehler, M. L., & McLaughlin, K. A. (2014). Structural stigma and hypothalamic-pituitary-adrenocortical axis reactivity in lesbian, gay, and bisexual young adults. *Annals of Behavioral Medicine*, *47*, 39–47.

Hatzenbuehler, M. L., McLaughlin, K. A., Keyes, K. M., & Hasin, D. S. (2010). The impact of institutional discrimination on psychiatric disorders in lesbian, gay, and bisexual populations: A prospective study. *American Journal of Public Health*, *100*, 452–459.

Hatzenbuehler, M. L., McLaughlin, K. A., & Nolen-Hoeksema, S. (2008). Emotion regulation and internalizing symptoms in a longitudinal study of sexual minority and heterosexual adolescents. *Journal of Child Psychology and Psychiatry*, *49*, 1270–1278.

Hatzenbuehler, M. L., Nolen-Hoeksema, S., & Dovidio, J. F. (2009). How does stigma "get under the skin?" The mediating role of emotion regulation. *Psychological Science*, *20*, 1282–1289.

Hatzenbuehler, M. L., Nolen-Hoeksema, S., & Erickson, S. J. (2008). Minority stress predictors of HIV risk behavior, substance use, and depressive symptoms: Results from a prospective study of bereaved gay men. *Health Psychology*, *27*, 455–462.

Hilt, L. M., & Nolen-Hoeksema, S. (2009). The emergence of gender differences in depression in adolescence. In S. Nolen-Hoeksema & L. Hilt (Eds.), *Handbook of depression in adolescents* (pp. 111–136). London, England: Taylor & Francis.

Hobfoll, S. E., Ritter, C., Lavin, J., Hulsizer, M. R., & Cameron, R. P. (1995). Depression prevalence and incidence among inner-city pregnant and postpartum women. *Journal of Consulting and Clinical Psychology*, *63*, 445–453.

Hyde, J. S., Mezulis, A. H., & Abramson, L. Y. (2008). The ABCs of depression: Integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. *Psychological Review*, *115*, 291–313.

Joiner, T., & Coyne, J. C. (1999). *The interactional nature of depression: Advances in interpersonal approaches*. Washington, DC: American Psychological Association.

Juster, R. P., Smith, N. G., Ouellet, E., Sindi, S., & Lupien, S. J. (2013). Sexual orientation and disclosure in relation to psychiatric symptoms, diurnal cortisol, and allostatic load. *Psychosomatic Medicine, 75*, 103–116.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., . . . Wang, P. S. (2003). The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association*, *289*, 3095–3105.

Kessler, R. C., McGonagle, K. A., Swartz, M., Blazer, D. G., & Nelson, C. B. (1993). Sex and depression in the National Comorbidity Survey I: Lifetime prevalence, chronicity, and recurrence. *Journal of Affective Disorders*, *29*, 85–96.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, *52*, 1048–1060.

Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: Developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry*, *60*(7), 709–717.

King, M., Semlyen, J., Tai, S. S., Killaspy, H., Osborn, D., Popelyuk, D., … Nazareth, I. A. (2008). Systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry*, *8*(1), 70.

Lennon, M. C. (1995). Work conditions as explanations for the relations between socioeconomic status, gender, and psychological disorders. *Epidemiologic Reviews*, *17*, 120–127.

Lewinsohn, P. M., Rhode. P., Klein, D. N., & Seeley, J. R. (1999). Natural course of adolescent major depressive disorder: I. Continuity into young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, *38*, 56–63.

Lopez-Duran, N., Kovacs, M., & George, C. J. (2009). Hypothalamic-pituitary-adrenal axis dysfunction in depressed children and adolescents: A meta-analysis. *Psychoneuroendocrinology*, *34*, 1272–1283.

McLaughlin, K. A., Hatzenbuehler, M. L., Xuan, Z., & Conron, K. J. (2012). Disproportionate exposure to early-life adversity and sexual orientation disparities in psychiatric morbidity. *Child Abuse and Neglect*, *36*, 645–655.

McLaughlin, K. A., Xuan, Z., Subramanian, S. V., & Koenen, K. C. (2011). State-level women's status and psychiatric disorders among U.S. women. *Social Psychiatry and Psychiatric Epidemiology*, *46*, 1161–1171.

Mendoza-Denton, R., Downey, G., Purdie, V., Davis, A., & Pietrzak, J. (2002). Sensitivity to status-based rejection: Implications for African-American students' college experience. *Journal of Personality and Social Psychology*, *83*, 896–918.

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, *129*, 674–697.

Monroe, S. M. (2008). Modern approaches to conceptualizing and measuring human life stress. *Annual Review of Clinical Psychology*, *4*, 33–52.

Mustanski, B. S., Chivers, M. L., & Bailey, J. M. (1999). A critical review of recent biological research on human sexual orientation. *Annual Review of Sex Research*, *13*, 89–104.

Negriff, S., & Susman, E. J. (2011). Pubertal timing, depression, and externalizing problems: A framework, review, and examination of gender differences. *Journal of Research on Adolescence*, *21*, 717–746.

Nishizawa, S., Benkelfat, C., Young, S. N., Leyton, M., Mzengeza, S., de Montigny, C., Blier, P., & Dikisic, M. (1997). Differences between males and females in rates of serotonin synthesis in human brain. *Proceedings of the National Academy of Sciences*, *94*, 5308–5313.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*, 569–582.

Nolen-Hoeksema, S. (2001). Gender differences in depression. *Current Directions in Psychological Science*, *10*(5), 173–176.

Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin*, *115*(3), 424–443.

Nolen-Hoeksema, S., & Hilt, L. M. (2009). Gender differences in depression. In C. Hammen & I. Gotlib (Eds.), *Handbook of depression* (pp. 386–404). New York, NY: Guilford.

Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality and Social Psychology*, *77*, 1061–1072.

Nolen-Hoeksema, S., Wisco, B. E., & Lybomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, *3*, 400–424.

Prinstein, M. J., & Aikins, J. W. (2004). Cognitive mediators of the longitudinal association between peer rejection and adolescent depressive symptoms. *Journal of Abnormal Child Psychology*, *32*, 147–158.

Rosenfield, S. (1989). The effects of women's employment, personal control and sex differences in mental health. *Journal of Health and Social Behavior, 30*, 77–91.

Rudolph, K. D., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development*, *70*, 660–677.

Russell, S. T., & Joyner, K. (2001). Adolescent sexual orientation and suicide risk: Evidence from a national study. *American Journal of Public Health*, *91*, 1276–1281.

Russell, S. T., Seif, H., & Truong, N. L. (2001). School outcomes of sexual minority youth in the United States: Evidence from a national study. *Journal of Adolescence*, *24*, 111–127.

Seedat, S., Scott, K. M., Angermeyer, M. C., Berglund, P., Bromet E. J., Brugha, T. S., … Kessler, R. C. (2009). Cross-national associations between gender and mental disorders in the World Mental Health Organization World Mental Health Surveys. *Archives of General Psychiatry*, *66*, 785–795.

Simon, R. W. (1995). Gender, multiple roles, role meaning, and mental health. *Journal of Health and Social Behavior*, *36*, 182–194.

Stice, E., Presnell, K., & Bearman, S. K. (2001). Relation of early menarche to depression, eating disorders, substance abuse, and comorbid psychopathology among adolescent girls. *Development and Psychopathology*, *37*, 608–619.

Stroud, L. R., Foster, E., Papandonatos, G. D., Handwerger, K., Granger, D. A., Kivlighan, K. T., & Niaura, R. (2009). Stress response and the adolescent transition: Performance versus peer rejection stressors. *Development and Psychopathology*, *21*, 47–68.

Stroud, L. R., Papandonatos, G. D., Williamson, D., & Dahl, R. (2004). Sex differences in the effects of pubertal development on responses to corticotrophin-releasing hormone challenge. *Annals of the New York Academy of Sciences*, *1021*, 348–351.

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research *Psychological Bulletin*, *132*, 959–992.

Wang, J., Korczykowski, M., Rao, H., Fan, Y., Pluta, J., Gur, R. C., … Detre, J. A. (2007). Gender differences in neural response to psychological stress. *Social Cognitive and Affective Neuroscience*, *2*, 227–239.

Wegesin, D. J. (1998). Event-related potentials in homosexual and heterosexual men and women: Sex-dimorphic patterns in verbal asymmetries and mental rotation. *Brain and Cognition*, *36*, 73–92.

Weiss, E. L., Longhurst, J. G., & Mazure, C. M. (1999). Childhood sexual abuse as a risk factor for depression

in women: Psychosocial and neurobiological correlates. *American Journal of Psychiatry, 156*, 816–828.

Weissman, M. M., Bland, R. C., Canino, G. J., Faravelli, C., Greenwald, S., Hwu, H. G., . . . Yeh, E. K. (1996). Cross-national epidemiology of major depression and bipolar disorder. *Journal of the American Medical Association, 276*, 293–299.

Williams, T. J., Pepitone, M. E., Christensen, S. E., Cooke, B. M., Huberman, A. D., Breedlove, N. J., . . . Breedlove, S. M. (2000). Finger-length ratios and sexual orientation. *Nature*, *404*, 455–456.

World Health Organization. (2008). Depression. Downloaded on May 12, 2008 from http://www.who.int/mental_health/management/depression/definition/en/.