Published in final edited form as:

Arch Sex Behav. 2014 July ; 43(5): 901–916. doi:10.1007/s10508-013-0129-6.

Disparities in Depressive Distress by Sexual Orientation in Emerging Adults: The Roles of Attachment and Stress Paradigms

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Abstract

Lesbian, gay, and bisexual youth have elevated rates of depression compared to heterosexuals. We proposed and examined a theoretical model to understand whether attachment and stress paradigms explain disparities in depressive distress by sexual orientation, using the longitudinal Growing Up Today Study (GUTS) and Nurses' Health Study II (NHSII). GUTS participants eligible for this analysis reported sexual orientation, childhood gender nonconforming behaviors (GNBs), attachment to mother (all in 2005), and depressive symptoms (in 2007). Mothers of the GUTS participants who are the NHSII participants reported attitudes toward homosexuality (in 2004) and maternal affection (in 2006). The sample had 6,122 participants. Of GUTS youth ($M = 20.6$ years old in 2005; 64.4% female), 1.7% were lesbian/gay (LG), 1.7% bisexual (BI), 10.0% mostly heterosexual (MH), and 86.7% completely heterosexual (CH). After adjusting for demographic characteristics and sibling clustering, LGs, BIs, and MHs reported more depressive distress than CHs. This relation was partially mediated (i.e., explained) for LGs, BIs, and MHs relative to CHs by less secure attachment. A conditional relation (i.e., interaction) indicated that BIs reported more distress than CHs as GNBs increased for BIs; no comparable relation was found

for LGs vs. CHs. Sibling comparisons found that sexual minorities (LGs, BIs, and MHs) reported more depressive distress, less secure attachment, and more childhood GNBs than CH siblings; the mothers reported less affection for their sexual-minority than CH offspring. The findings suggest that attachment and childhood gender nonconformity differentially pattern depressive distress by sexual orientation. Attachment and related experiences are more problematic for sexual minorities than for their CH siblings.

Keywords

Sexual orientation; depression; attachment; stress; youth

INTRODUCTION

Lesbian, gay, and bisexual (LGB) youth report poorer mental health than heterosexual peers, including, for example, elevated rates of diagnosed depression and more depressive distress (D'Augelli, 2002; Fergusson, Horwood, & Beautrais, 1999; Fergusson, Horwood, Ridder, & Beautrais, 2005; Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008; Jorm, Korten, Rodgers, Jacomb, & Christensen, 2002; Marshal et al., 2011; Russell, 2006). We offer a theoretical model that considers how disparities in health by sexual orientation might be affected by attachment and stress paradigms. We compared different sexual-minority persons (lesbians/gays [LGs], bisexuals [BIs], and mostly heterosexuals [MHs]) to completely heterosexuals (CHs) because subgroups of sexual minorities may not differ to the same extent from CHs on health (Jorm et al., 2002; Russell, Driscoll, & Truong, 2002). We examined the model with respect to depressive distress with a large national cohort that has been followed over time, using child characteristics reported by the youth and maternal characteristics reported by the mother. Finally, we compared the sexual minorities to their CH siblings on the model's theoretical variables, allowing us to assess sexual-orientation disparities within families as we simultaneously controlled for potential confounders that are stable in but not across families.

Theoretical Model of Health Disparities by Sexual Orientation

Figure 1 depicts the theoretical model explaining sexual-orientation health disparities by attachment and stress paradigms. Although two of the factors theoretically inform one another (i.e., attachment and maternal affection), they are placed in the model by the year (in parentheses) in which the constructs were assessed. According to the model, the attachment paradigm is hypothesized to explain disparities in depressive distress by sexual orientation.

Intervening Paradigm of Attachment¹—Attachment begins early in life and affects the individual and her or his relationships throughout life. Attachment to caregivers represents an important foundation for developing a sense of emotional security and safety (Bowlby, 1969), underscoring the role of parental affection. Children's early experiences with primary caregivers are theorized to shape their internal working models (templates of thought,

¹We use the term "attachment paradigm" to encompass the two attachment factors of attachment and maternal affection. By so doing, we avoid the confusion of referring to the set of two factors by the same name as one of the factors.

emotion, and behavior) concerning expectations and beliefs about the availability and responsiveness of the attachment figure (i.e., the primary caregiver). The attachment figure (usually the mother) becomes the model of what is expected from others and proves critical for the individual's self-worthiness (the working model of the self) (Bowlby, 1969, 1988a, 1988b). The latter has implications for mental health throughout life. For example, insecure attachment has been related to internalizing problems, such as depression, in general samples of adolescence (for a review, see Brumariu & Kerns, 2010). Further, internal working models of the self and others are hypothesized to affect current relationships through ongoing interpretations of social experiences and through habitual behavioral and emotional responses in close relationships (Hazan & Shaver, 1987, 1994). Nevertheless, attachment is not a static construct that is fixed once it develops. It may change over time. Below, we discuss how perceiving or learning that one's child is a sexual minority may provoke negative reactions from the parent (e.g., rejection, abuse) that may have profound implications for the child's attachment.

The importance of attachment for subsequent development has been demonstrated in a number of long-term longitudinal studies (Grossmann, Grossmann, & Waters, 2005), as has attachment's relation to psychopathology, including depression, substance abuse/dependence, and eating disorders in the general population (for a review, see Dozier, Sovall-McClough, & Albus, 2008). However, only a handful of empirical studies have applied attachment theory to the study of sexual minorities. One study focused on LGB young people, finding that insecure attachment to "close others" was related to sex work and substance use (Gwadz, Clatts, Leonard, & Goldsamt, 2004). More studies are available on LGB adults, but they too have focused on attachment in current relationships (e.g., Carnelley, Hepper, Hicks, & Turner, 2011; Landolt, Bartholomew, Saffrey, Oram, & Perlman, 2004; Mohr & Fassinger, 2003; Zakalik & Wei, 2006). The poverty of research generally and on parental attachment of young LGB people specifically is surprising considering the importance of attachment for relationships and health and the likelihood that the attachment of some sexual minorities may be problematic, given the possibility of parental rejection and victimization (Corliss, Cochran, & Mays, 2002; D'Augelli, 2002; D'Augelli, Grossman, & Starks, 2005; Landolt et al., 2004; Ryan, Huebner, Diaz, & Sanchez, 2009; Wilson & Widom, 2010).

Based on the above, attachment was hypothesized to mediate health disparities by sexual orientation. Specifically, the elevated depressive distress expected among sexual minorities relative to heterosexuals would be explained by less secure attachment among the sexual minorities.

In addition to attachment, maternal reporting of affection for the child, as far as we know, has not been studied alongside youth's maternal attachment in understanding health disparities by sexual orientation. Mother's affection for the child affects and is affected by the child's attachment. We expected mothers to have less affection for offspring who are or might be a sexual minority because most mothers are heterosexual and have probably internalized society's stigmatization of homosexuality to some extent. If true, the anticipated sexual-orientation disparity in depressive distress was expected to be explained by less maternal affection for the sexual minorities.

Stress Paradigm—Stress, which is hypothesized to affect mental health, refers to acute events or chronic conditions that disrupt the individual's homeostasis or allostasis and that make demands that tax or exceed the individual's resources (e.g., Grant et al., 2003; Lazarus & Folkman, 1984; McEwen, 1998, 2002; Monroe, 2008). Sexual minorities are particularly vulnerable to experiencing stress, given society's stigmatization of homosexuality or of anyone perceived to be LGB. The literature on this "gay-related" (Rosario, Schrimshaw, Hunter, & Gwadz, 2002) or "minority" (Meyer, 2003) stress has primarily focused on direct experiences of victimization (Katz-Wise & Hyde, 2012) or internalized homonegativity (Newcomb & Mustanski, 2010). Other experiences that may generate stress for the individual have been less well examined. Here, we focus on two such experiences that are likely to vary with sexual orientation and are expected to have negative implications for mental health.

Maternal discomfort with homosexuality. Little is known about the influence of maternal attitudes (e.g., discomfort with homosexuality) on children's mental health, particularly for sexual-minority youth. Maternal negative attitudes for the LGB child represent a "distal stressor" in that they occur independently of the child, require adaptation, and represent prejudice (Meyer, 2003). Prejudice is communicated verbally or nonverbally and subtly or blatantly. Prejudice's subtle verbal and nonverbal expressions and their stressful impact on the victim have been the focus of theoretical and empirical work on microaggressions (Sue, 2010; Sue et al., 2007). Thus, it is not surprising that maternal negative attitudes toward an LGB child have been found to be related to the young person's depressive symptoms (Floyd, Stein, Harter, Allison, & Nye, 1999). Other research has shown that parental rejection (i.e., a potential behavioral manifestation of parental negative attitudes) is related to poorer mental health among young LGBs (D'Augelli, 2002; Ryan et al., 2009). Whether a parent actually knows of a child's minority sexual orientation may not be required. All that may be necessary is for the parent to suspect, whether consciously (e.g., the child's gender nonconforming behaviors) or unconsciously, that the child may be a sexual minority for the negative attitudes to be activated and affect the sexual-minority individual's mental health. However, the attitudes are often less relevant for heterosexuals.

Maternal attitudes toward homosexuality (e.g., maternal discomfort with homosexuality) may represent a gay-related stressor for sexual minorities that operates at the family-level, influences parent-child attachment systems, and accounts for poorer health among sexual-minority than heterosexual youth. A dimension of maternal discomfort with homosexuality that remains under-examined is parental evaluation of how important it is that offspring be heterosexual. In addition, all extant assessments of maternal attitudes and reactions to the child, as far as we know, have been based on reports from the sexual-minority individual and not, as will be the case here, on the parent's own report.

Childhood gender nonconforming behaviors (GNBs). GNBs--the expression of characteristics that are socially and culturally associated with the other sex (Bell, Weinberg, & Hammersmith, 1981)--have been associated with sexual-minority orientation (for a review, see Zucker, 2008). GNBs also have been related to internalizing and externalizing symptoms among young sexual minorities, including depressive symptoms and suicide attempts (D'Augelli et al., 2005; D'Augelli, Grossman, & Starks, 2006; Friedman, Koeske,

Silvestre, Korr, & Sites, 2006; Rosario, Schrimshaw, & Hunter, 2008), and to higher rates of experiencing stress, such as discrimination, violence, and family-related stressors directly or by failing to protect the child, regardless of sexual orientation (D'Augelli et al., 2006; Smith & Leaper, 2006). The reason for such relations is that GNBs are known to provoke negative reactions from those who find such behaviors an unacceptable violation of gender or heterosexual norms, as a qualitative study of adults found (Gordon & Meyer, 2007). Nevertheless, there is variability on GNBs among sexual minorities (Rosario, Schrimshaw, Hunter, & Levy-Warren, 2009) and heterosexuals (Egan & Perry, 2001). Given the above literature, this variability suggests that more GNBs should be related to poorer mental health.

Summary—We propose a theoretical model (Fig. 1) to understand depressive distress, our indicator of poor health. We offer the following major hypotheses: Sexual orientation disparities exist in depressive distress and all other theoretical variables. Less secure attachment, less maternal affection, more maternal discomfort with homosexuality, and more childhood GNBs are related to more depressive distress. Sexual-orientation disparities in depressive distress are mediated by attachment and maternal affection. Finally, we expect to support the theoretical model by the following alternative study design that examines the health and related factors of sexual minorities relative to heterosexual siblings within the same families. This design offers an alternative way by which to highlight the theoretical model and draw out additional implications of the model for the mental health of sexual minorities.

Comparison of Sexual-Minority Young People to Their Heterosexual Siblings

—To begin to control for potential confounders of the relations between sexual orientation and other constructs in the theoretical model, we used a sibling-comparison design (Lahey & D'Onofrio, 2010), comparing sexual-minority young people to their CH siblings. Thus, we controlled to some extent for shared genetic factors and for environmental factors that vary across but not within families (e.g., depressed mother, socioeconomic status, neighborhood), as we examined whether sexual minorities were treated differently from or have characteristics that differ from those of their heterosexual siblings. Based on our earlier arguments, we hypothesized that sexual-minority young people, as compared with CH siblings, will report more depressive distress, less secure attachment to their mothers, and more childhood GNBs; their mothers, in turn, will report less affection for their sexual-minority than for their CH offspring.

METHOD

Participants

Participants in the Growing Up Today Study (GUTS) were included in the current analysis if they reported data specific to the theoretical model and sociodemographic characteristics. Their mothers, participants in the Nurses' Health Study II (NHSII), also had to provide data specific to the model. In the 2005 wave, 10,420 young people (61.7% of the original sample) contributed data and in 2007 a total of 9,409 (55.7%) provided data. Of the mothers, 12,784 contributed data in 2004 and 11,580 in 2006. For 194 participants, randomly missing data on

individual items were imputed to compute the scale score. The combination of these conditions resulted in a final analytic sample of 6,122 participants.

In 2005, the GUTS participants in the final analytic sample ranged in age from 17 to 25 years ($M = 20.6$, $SD = 1.7$). The majority were young women (64.4%) and White (93.9%). In 2005, participants reported their sexual orientation as being lesbian/gay (LG, 1.7%), bisexual (BI, 1.7%), mostly heterosexual (MH, 10.0%), and completely heterosexual (CH, 86.7%).

We compared the analytic sample to the original GUTS sample ($N = 16,882$) on sociodemographic characteristics. The samples did not differ significantly on age at the initial assessment in 1996 or race/ethnicity. However, we had more female young people in the analytic sample (64%) than the original sample (53%).

Procedure

GUTS is a longitudinal cohort study of the children of women participating in NHSII, a prospective cohort study of over 116,000 female registered nurses across the United States. Invitations were sent to mothers in NHSII to enroll their 9- to 14-year-old children in GUTS. Names of over 26,000 boys and girls were supplied by the mothers. The eligible children were sent a questionnaire addressing a broad range of health topics in 1996, which they were asked to return if they wanted to participate in the study. Youth participating in GUTS at the beginning of the study included 7,843 boys and 9,039 girls. Of the youth, 93.3% were White and 6.7% of ethnic/racial minority backgrounds. A complete description of GUTS is available elsewhere (Field et al., 1999). The institutional review board at Brigham and Women's Hospital approved the study.

Measures

Sexual Orientation (2005)—An item adapted from the Minnesota Adolescent Health Survey (Remafedi, Resnick, Blum, & Harris, 1992) assessed sexual orientation in 2005: “Which of the following best describes your feelings? (mark one answer): 1 = completely heterosexual (attracted to persons of the opposite sex), 2 = mostly heterosexual, 3 = bisexual (equally attracted to men and women), 4 = mostly homosexual, 5 = completely homosexual (gay/lesbian, attracted to persons of the same sex), 6 = not sure.” Responses were categorized into four groups to obtain adequate statistical power for analyses: completely heterosexual (CH), mostly heterosexual (MH), bisexual (BI), and completely/mostly homosexual (lesbian/gay, LG). Three dummy coded variables were created for analyses, comparing each sexual-minority group to CH. The 29 participants who were “not sure” of their sexual orientation in 2005 were excluded from all analyses. The analytic sample of 6,122 participants did not include these 29 participants.

Attachment (2005)—Attachment was assessed in 2005 using a validated scale employed in research with youth (Jaccard & Dittus, 1991, 2000; Jaccard, Dittus, & Gordon, 1996). GUTS participants reported the degree of satisfaction with their relationship with their mother across 9 items (e.g., general communication, affection, emotional support, respect, shared time, and interests). Sample items include “I am satisfied with the respect my mother

shows me;” “I am satisfied with the way my mother and I communicate with each other.” The items were scored using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), which, if needed, were reverse coded so that higher scores indicated more secure attachment. Items were correlated, ranging from 0.54 to 0.86 ($p < .0001$). An exploratory factor analysis (EFA, using PROC FACTOR in SAS for this and all other factor analyses) indicated that the 9 items loaded on a single factor (eigenvalue = 6.20; proportion of explained variance = 69%). Response scores were summed and possible scores ranged from 9 to 45 (Cronbach’s $\alpha = 0.94$).

Our attachment measure assesses quality of relationship with the parent. The quality of that relationship is not a direct measure of attachment as traditionally defined: the behavioral or state-of-mind categories of security-insecurity revealed by patterns of exploration in times of safety and seeking of security from the attachment figure in the face of danger or elevated distress. However, our measure can be considered an indirect marker of attachment. Indeed, it has been found that satisfaction with social support from parents explained the relation between attachment as assessed by the Adult Attachment Interview (AAI) (George, Kaplan, & Main, 1984, 1996) and subsequent adjustment to the transition between high school and military service in Israel, where such service is mandatory (Scharf, Mayseless, & Kivenson-Baron, 2011). Our attachment measure was similar to other attachment measures that assess quality of relationship with the parent and that are commonly used in research with youth, in particular the Inventory of Parent and Peer Attachment (IPPA) (Armsden & Greenberg, 1987). The validity of the IPPA has been confirmed, given its relations with theoretically meaningful outcomes (e.g., Armsden & Greenberg, 1987; Emmanuelle, 2009; Ruijten, Roelofs, & Rood, 2011; Sternberg, Lamb, Guterman, Abbott, & Dawud-Noursi, 2005). In addition, the IPPA has been related to other attachment measures (Van Ryzin & Leve, 2012), including the AAI (Maier, Bernier, Pekrun, Zimmermann, & Grossmann, 2004). The AAI, an open-ended interview, is considered the “gold standard” for measuring attachment in adolescence and adulthood.

Maternal Affection (2006)—Mothers in 2006 reported their satisfaction with their relationship with their child (a proxy for affectional bond) across the same 9 items completed by their children (see Attachment measure above). The same 5-point Likert scale was used and items were reverse coded to ensure that higher scores indicated greater affection. Items were related ($r = 0.56$ to 0.87 ; $p < .0001$). An EFA found that items loaded on a single factor (eigenvalue = 6.22; proportion of variance explained = 69%). Possible scores ranged from 9 to 45 (Cronbach’s $\alpha = 0.94$). Mothers with multiple children in GUTS completed this measure for each child.²

Maternal Discomfort with Homosexuality (2004)—Mothers were asked in 2004 to indicate how much they agreed with two statements on a 5-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree: “I feel uneasy around people who are very open in

²Although attachment and maternal affection use the same items, the constructs are not identical. Attachment is not symmetrical; it flows from the child to the parent because attachment represents safety and security (Main, 1999). A child does not naturally provide safety and security to a parent, except perhaps during a parent’s old age. Otherwise, evidence of a parent seeking safety and security from a child represents parental psychopathology, which creates severe disruption of the child’s attachment.

public about being gay, lesbian, or bisexual” and “It is important to me that my child(ren) be heterosexual (attracted only to persons of the opposite sex).” The items were correlated ($r = 0.59$; $p < .0001$) and an EFA found the items loaded on a single factor (eigenvalue = 1.59; proportion of variance explained = 80%). The two items were reverse scored and summed to create a score ranging from 2 to 10. Higher scores indicated greater maternal discomfort or more negative attitudes toward homosexuality (Cronbach’s $\alpha = 0.74$).

Childhood Gender Nonconforming Behaviors (GNBs, 2005)—GUTS participants in 2005 completed four items taken from a questionnaire developed to assess “recalled gender-typed behavior” and validated with, for example, homosexual and heterosexual adults (Zucker et al., 2006). Each GUTS participant reported her or his gendered behavior as a child (up to age 11) with respect to sex of TV/movie characters imitated, sex of character assumed in pretend play, favorite toy/game, and gendered experience of self as child (e.g., “When I was a child, I felt...”). The response scales vary by item and sex of the participant, but use a 5-point scale ranging, for example, from only the same sex or always masculine (or feminine) to only the other sex or always feminine (or masculine), with a sixth option indicating no involvement in the activity assessed (i.e., systematic missing). The response scale for the item, “When I was a child, I felt...,” indicates that gender-typed behavior rather than gender identity (i.e., the sense of self as girl/woman or boy/man) was assessed, given the response scale ranges from “very masculine” to “very feminine.” For GUTS participants, item correlations ranged from 0.44 to 0.55 ($p < .0001$). An EFA found that the four items loaded on a single factor (eigenvalue = 2.16; proportion of variance explained = 54%). The items were summed to create a total score, ranging from 4 to 20. Higher scale scores indicated greater childhood GNBs (Cronbach’s $\alpha = 0.72$).

Depressive Distress (2007)—The health outcome was depressive distress assessed in 2007 using the reliable and validated 10-item Center for Epidemiologic Studies Depression (CES-D 10) Scale (Andresen, Malmgren, Carter, & Patrick, 1994), a screener used widely with youth (Bradley, Bagnell, & Brannen, 2010; Bradley, McGrath, Brannen, & Bagnell, 2010; Van Voorhees et al., 2009). GUTS participants were asked to indicate how often in the past week they felt or behaved in certain ways on a response scale ranging from 0 = rarely/never to 3 = all the time (e.g., “During the past week, I was bothered by things that usually don’t bother me”). After reverse coding two items, scores were summed to compose the indicator of depressive distress. Scores ranged from 0 to 30 and higher scores indicated more distress (Cronbach’s $\alpha = 0.82$).

Data Analysis

Descriptive statistics were computed and distributions of scales were assessed for normality. SAS 9.2 was used for all analyses.

Bivariate Analyses and Path Analyses—Given sibling data in GUTS, the independence assumption does not hold. Generalized estimating equations (GEE), a method for analyzing correlated data (Liang & Zeger, 1986; Zeger, Liang, & Albert, 1988), were used for all analyses to adjust for sibling clusters. These regressions were computed using PROC GENMOD. The working variance-covariance structure was specified as

exchangeable (compound symmetry). No missing data were allowed by the statistical procedure.

All continuous variables were first transformed to z scores ($M = 0$, $SD = 1$) for the GEE analyses. The regression of a standardized variable (e.g., depression) on a standardized predictor (e.g., attachment) generates standardized slopes that range from -1.0 to 1.0 (beta weights). For a binary predictor (e.g., dummy coded sexual orientation comparing LG to CH), the standardized slope represents the difference between the means of the two groups on the outcome. Because the outcome variable is standardized (z score), the mean differences are in SD. Equivalently, the slope (β) or difference between the means equals Cohen's d (Cohen, 1988) using standard scores, given the denominator of d , the SD_{zy} , equals 1.0. Cohen (1988) recommended that a d of 0.20 (i.e., a fifth of a SD) is a small effect, 0.50 (i.e., half a SD) a medium effect, and 0.80 a large effect; medium and large effects are apparent to the naked eye (Cohen, 1988). The slope (β) coefficient for two groups on a standardized continuous variable is not bounded by -1.0 to 1.0 .

Regression models were computed, regressing each variable in the theoretical model on the others in a bivariate analysis that adjusted only for sibling clustering. All models were then re-fit with adjustments for age, sex, race/ethnicity, and sibling clustering. Path analysis (PA) was used to examine the theoretical model, although PA was modified such that the slopes for dichotomous groups were not standardized beta weights comparable to those of ordinary least squares, but standardized beta weights generated by GEE regressions. PA is a series of simultaneous linear regressions, in which each outcome is predicted by factors that are adjusted by the other factors in the analysis. We also adjusted the PA for sibling clustering and the covariates related to variables in the theoretical model. The PA tested all mediational hypotheses using the MacArthur rules (Kraemer, Kiernan, Essex, & Kupfer, 2008).

Sibling Analyses—Sexual minorities were compared to their CH siblings on the theoretical variables and childhood GNBs using the paired t -test. When more than one CH sibling existed, the mean of the scores of the CH siblings for each variable was used in the comparison. A similar algorithm was used if more than one sexual-minority sibling was present in the family. The sexual minorities and CH siblings were not compared on maternal discomfort with homosexuality, given the mothers' attitudes were not specific to any child.

Analyses of Missing Data—Given the merging of multiple waves of data from GUTS participants (2005, 2007) and their mothers (2004, 2006), missing data may be of concern. Analyses identified only one variable as systematically missing by sexual orientation. Compared to CHs, the mothers of LGs were more likely to have had missing data on maternal discomfort with homosexuality ($OR = 1.74$; 95% $CI = 1.11, 2.72$; $p < .05$). However, missing data on maternal attitudes did not affect the relations between any of the theoretical predictors and depression, including the comparison of LGs to CHs on depression. This was determined in two ways. First, a dummy coded variable for missing data on maternal discomfort (yes/no) did not predict depressive distress after all theoretical variables were included in the analyses and adjustments were made for demographic characteristics and sibling clustering. Moreover, the coefficients for the relations between the theoretical predictors and depressive distress in this analysis were similar to those

without the missing dichotomy. Second, these patterns of findings on the full sample were replicated when focusing just on the subsample of LGs relative to CHs

RESULTS

Table 1 shows descriptive data for the variables of the theoretical model stratified by sexual orientation and controlling for sibling clusters. Sexual minorities reported more depressive distress and less secure attachment than CHs. A graded relation was seen in childhood gender nonconforming behaviors (GNBs) by sexual orientation, with more GNBs successively reported by each sexual-orientation group: starting with CHs, who reported the lowest levels of childhood GNBs, followed by MHs, then BIs, and ending with LGs, who reported the highest levels of such behaviors. Age, sex, and ethnicity/race were related to sexual orientation; thus, we controlled for them in the path analyses. LGs and MHs were older than CHs. MHs and BIs were less likely to be male and LGs were more likely to be male than CHs. MHs and BIs were less likely to be White than CHs.

Bivariate Relations and Multivariable Models

Table 2 shows the bivariate relations among the theoretical and sociodemographic variables, all adjusted for sibling clustering. Given the study's power ($N = 6,122$), we decided that relations had to be at least small in magnitude (β approximately $|0.10|$ for relations among continuous variables, or, $\beta = \text{Cohen's } d$ approximately $|0.20|$ for relations of dichotomous and continuous variables) to be considered meaningful, although we report the actual significance level for the reader's information. Even by our strict rule, nearly all relations among the theoretical variables were significant and in the hypothesized directions. The non-significant relations primarily involved maternal discomfort with homosexuality. In addition, maternal discomfort was related to lower rather than higher depressive distress ($\beta = -0.06$). Moreover, its relation with distress was equally small for each sexual-orientation group although the direction varied: $\beta = 0.07$ (95% $CI = -0.16, 0.29$) for LGs, $\beta = 0.09$ (95% $CI = -0.10, 0.29$) for BIs, $\beta = -0.03$ (95% $CI = -0.12, 0.05$) for MHs, and similarly small for CHs, but statistically significant given their large sample size ($\beta = -0.04$; 95% $CI = -0.07, -0.01$; $p < .01$).

Given the known sex differences in depressive distress that emerge during puberty, we examined whether the relation between each theoretical predictor and distress varied by sex, after controlling for the main effects, demographic factors (age, sex, and ethnicity/race), and sibling clustering. As dictated by rules for assessing interactional effects (Cohen, Cohen, West, & Aiken, 2003), we controlled, for example, for the main effects of sex and attachment before hierarchically entering the product term of sex by attachment in order to examine whether the relationship between attachment and depressive distress differed significantly between the young men and women. Seven sex moderating relations were computed. Three involved sexual orientation as LG, BI, or MH relative to CH examined in a single analysis. For the remaining four relations, a single analysis was conducted for each sex interaction involving each of the following four predictors: attachment, maternal affection, maternal discomfort with homosexuality, and GNBs. Sex did not significantly moderate the relations between sexual orientation and depressive distress. The relation

between GNBs and depressive distress marginally varied by sex, but the effect was quite small ($\beta = .06$; 95% $CI = -0.004, 0.12$; $p = .06$). The interactions of sex by the remaining theoretical variables on distress were not significantly different. Thus, the relations between the predictors and depressive distress were not moderated by sex. Stratification by sex was not needed because the findings equally apply to the young men and women.

Table 3 shows the relations among the factors of the theoretical model, adjusted for demographic characteristics (age, sex, and race/ethnicity) and sibling clustering. All sexual-minority individuals reported more depressive distress than CHs. Less secure attachment and less maternal affection for the child were also related to more depressive distress. In addition, attachment and maternal affection were related to sexual orientation, such that sexual-minority young people reported less secure attachment and less maternal affection than CH peers. As hypothesized, attachment and maternal affection were potential mediators of the relations between sexual orientation and depressive distress because they were related to sexual orientation and depressive distress, even after adjusting for demographic characteristics and sibling clustering.

Path Analyses

Figure 2 depicts the path analytic results. Table 4 shows the fitted linear models that investigated mediation. Every path analysis controlled for all other theoretical variables in the analysis, demographic characteristics, and sibling clustering.

Disparities in Depressive Distress by Sexual Orientation—We hypothesized that disparities in depressive symptoms by sexual orientation would be mediated. Given that the relation between being LG vs. CH and depressive distress ($\beta = 0.27$) was explained (i.e., rendered small in magnitude and non-significant: $\beta = 0.09$) by the other theoretical variables (compare Models 1 and 4 in Table 4), this provided evidence of mediation. Given that the relations between being BI vs. CH and depressive distress decreased (from $\beta = 0.48$ to 0.31), as did the comparable relations between being MH vs. CH (from $\beta = 0.41$ to 0.29), this too provided evidence of mediation. However, the mediation for BIs and MHs was “partial” because the relationship, although attenuated, remained significant after considering the other theoretical variables. Below, we examine our more nuanced hypotheses that the attachment paradigm mediates sexual-orientation disparities in depressive distress.

Mediators of Disparities in Depressive Distress by Sexual Orientation—The relation between sexual orientation and depressive symptoms ($\beta = 0.27$) was partially mediated for the LGs by less secure attachment. When just attachment was added to Model 1 in Table 4, the relation for LGs compared to CHs was attenuated to a small effect ($\beta = 0.19$; 95% $CI = 0.006, 0.37$; $p < .05$). Maternal affection by itself had little mediational effect on the relation (β decreased from 0.27 to 0.23 ; 95% $CI = 0.05, 0.42$; $p < .05$). When both attachment and maternal affection were included, attenuation was not much improved from what it had been when just attachment was in the model ($\beta = 0.18$; 95% $CI = 0.002, 0.37$; $p < .05$).

Partial mediation of the relation between sexual orientation and depressive distress was found for BIs (from $\beta = 0.48$ to 0.31) relative to CH (compare Models 1 and 4 in Table 4).

Less secure attachment was partly responsible. When just attachment was added to Model 1, the path coefficient for BIs was attenuated in magnitude ($\beta = 0.37$; 95% $CI = 0.16, 0.58$; $p < .01$). Only adding maternal affection resulted in a minor reduction in the coefficient for BIs ($\beta = 0.44$; 95% $CI = 0.22, 0.65$; $p < .0001$). Including attachment and maternal affection simultaneously offered no additional attenuation relative to that obtained when only attachment was included ($\beta = 0.37$; 95% $CI = 0.16, 0.58$; $p < .01$).

Similarly, the estimated path coefficient for MHs compared to CHs on depressive distress was partially mediated (from $\beta = 0.41$ to 0.29). The coefficient was rendered smaller in magnitude after adding only attachment to Model 1 ($\beta = 0.33$; 95% $CI = 0.24, 0.42$; $p < .0001$); maternal affection by itself had little effect ($\beta = 0.38$; 95% $CI = 0.29, 0.47$; $p < .0001$). Adding both attachment and maternal affection simultaneously did not improve on the attenuation provided just by attachment ($\beta = 0.33$; 95% $CI = 0.24, 0.42$; $p < .0001$).

Other Hypotheses of the Theoretical Model—All sexual-minority young people reported significantly less secure attachment than CHs (Fig. 2 or Table 4, Model 2). In addition, less secure attachment predicted more depressive distress in the final adjusted model (Fig. 2 or Table 4, Model 4).

We hypothesized that childhood GNBs would be related to depressive distress, even after adjusting for all other predictors and covariates (Fig. 1). Although the relation was statistically significant (Fig. 2), the magnitude ($\beta = 0.05$; $p < .01$) was below our stipulated floor ($\beta \approx .10$), possibly because of the significant interaction found between sexual orientation and childhood GNBs on depressive distress. A stronger relation was found between GNBs and depressive distress for BIs than for CHs ($\beta_{BI*GNBs} = 0.19$; 95% $CI = -0.004, 0.39$; $p = .055$). A similar interaction effect was not observed for LGs ($\beta_{LG*GNBs} = -0.02$; 95% $CI = -0.17, 0.13$) and MHs ($\beta_{MH*GNBs} = -0.04$; 95% $CI = -0.12, 0.04$) compared to CHs.

Maternal discomfort with homosexuality had little to do with depressive distress directly (Fig. 2 or Table 4, Model 4) or as a potential moderator of the relations between sexual orientation and depressive distress. The latter effects were modest and non-significant (β 's were 0.09 for LG vs. CH, 0.11 for BIs vs. CH, and -0.01 for MH vs. CH).

Sibling Analyses—The young sexual minorities ($n = 205$) were compared to their CH siblings ($n = 942$) on the variables in the theoretical model (Table 5). In the 183 families with sexual-minority and CH siblings, the former experienced more depressive distress, less secure attachment, less maternal affection, and more childhood GNBs than CH siblings. The medium to large effect sizes indicate that the differences would be apparent to the average person.

Sibling analyses by sex (Table 5) indicated that the aforementioned differences were equally strong and significant for the female sexual minorities relative to their female CH siblings. Findings for the young men were non-significant between sexual minorities and CH siblings for attachment and maternal affection, although strong differences were found for depressive distress and childhood GNBs.

DISCUSSION

The current study found disparities in depressive distress by sexual orientation in a large cohort of emerging adults. Sexual minorities reported significantly more depressive distress than completely heterosexuals (CHs), adjusting for demographic factors (age, sex, and race/ethnicity) and sibling clustering. Anticipating these disparities, we offered and empirically tested a model grounded in the theoretical literature on attachment and stress paradigms to understand disparities in depressive distress by sexual orientation.

The Theoretical Model of Health Disparities by Sexual Orientation

Attachment Paradigm—Four findings confirmed the importance of attachment. First, less secure attachment was related to more depressive distress, even after adjusting for covariates and other potential confounders. Second, sexual minorities reported less secure attachment than CHs. This relation was also found for within-family comparisons when sexual minorities were compared to their CH siblings. Third, attachment partially mediated the relation between sexual orientation and depressive distress for lesbians/gays (LGs), bisexual (BIs), and mostly heterosexuals (MHs). Fourth, child reports of attachment and maternal reports of affection were related, supporting a transactional model (Cicchetti & Lynch, 1993; Cicchetti & Toth, 1998) of child and parent affecting one another. However, the relation between maternal affection and depressive distress was rendered quite modest once controls were imposed for other theoretical variables, most particularly attachment.

Our findings on the influential role of attachment in psychological distress were consistent with previous research on general samples (Grossmann et al., 2005) and suggest that psychological mechanisms explain disparities in depressive distress by sexual orientation. Furthermore, attachment may explain other processes found among sexual minorities, such as the relation between parental rejection and psychological distress, given (1) the mediating role of attachment in the relation between child abuse and internalizing symptoms (Hankin, 2005) and (2) the elevated rates of child abuse among sexual minorities relative to heterosexuals (Corliss et al., 2002; Wilson & Widom, 2010). Attachment may offer insights into the personal relationships of sexual minorities, given the transference of attachment processes that occurs from primary caregivers to others, such as love objects (for a review of findings on the general population, see Berlin, Cassidy, & Appleyard, 2008). The ways that friends or romantic couples cope with disagreements, for example, are a function of individuals' attachment styles and this has been found among sexual minorities (Gaines & Henderson, 2002).

Attachment may also affect the sexual identity development of sexual minorities, that is, the individual's formation and integration of a sexual-minority identity. An internal working model of the self based on parents encouraging age-appropriate autonomy and exploration and on parents having open and honest conversations with the child, as compared with parents who, for example, pressure the child to serve the parents' needs (Bowlby, 1973), should have implications for sexual identity development. The process of exploring, accepting, and integrating an unfolding sexual-minority identity (for detailed discussion of this developmental process, see Rosario, Schrimshaw, & Hunter, 2011) should be facilitated by parents who provide a secure base from which the child may explore and who value

honest discussions with the child about her or his experiences. On the other hand, a child who exists to meet the parents' needs is likely to experience difficulties undergoing a minority sexual identity developmental process, especially if the parents' attitudes toward homosexuality are negative. Although little work has been done in this area, some preliminary or indirect data confirm this hypothesis (Mohr & Fassinger, 2003; Ridge & Feeney, 1998; Shilo & Savaya, 2011).

Given our findings and the broad implications of attachment, we recommend a vigorous program of research focused on attachment among sexual minorities. Although some work has been done on attachment among sexual minorities, most of it has focused on "adult" attachment, meaning examination of attachment in the current relationships of adults (e.g., Elizur & Mintzer, 2001; Jellison & McConnell, 2003; Zakalik & Wei, 2006). Given adult attachment is premised on attachment to primary caregivers and given the importance of the latter attachment for a broad range of life outcomes, as detailed above, more research is needed on attachment to primary caregivers. Such research should use the strongest available measures, such as the AAI (George et al., 1984, 1996), whenever study procedures and samples allow for such a guided and relatively open-ended interview. Nevertheless, a self-administered and close-ended inventory, such as used here, is invaluable with large samples. Potential candidate inventories for future research with youth include the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) and the Adolescent Attachment Questionnaire (West, Rose, Spreng, Sheldon-Keller, & Adam, 1998) because both are correlated with the AAI (Maier et al., 2004; West et al., 1998).

Stress Paradigm—Although stress was hypothesized to disrupt homeostasis or allostasis and, consequently, negatively affect health, we found little support for this hypothesis. Three possible explanations may account for lack of significant findings between stress and depressive distress.

First, intervening processes between stress and distress may change the strength of the relation between these two dimensions. Indeed, the link between stress and health is complicated because moderating processes, such as coping, are possible (Lazarus & Folkman, 1984). Depending on the coping strategy deployed against stress, several outcomes are possible: (1) health is unaffected if the individual masters stress, (2) health may deteriorate if stress is unaffected, and (3) health may be compromised if the coping strategy amplifies stress or generates additional stressors (side-effects) that have their own negative impact on health. Although we did not assess coping, perhaps it is the case that the more time that elapses between the measurement of stress and health, the greater the likelihood of moderating processes intervening in the stress-health relation. We assessed health in 2007, maternal discomfort with homosexuality in 2004, and gender nonconforming behaviors (GNBs) in 2005. Moreover, GNBs were recalled from childhood although such behaviors are relatively stable over time (Rieger, Linsenmeier, Gygax, & Bailey, 2008). Timing between stress and health may explain why we found little support for relations between stress and depressive distress.

Nevertheless, we did find a conditional relation between sexual orientation (for BIs vs. CHs) and distress by childhood GNBs. This finding takes on added meaning when considering

that BIs have been found to report poorer health than LGs (e.g., Jorm et al., 2002; Russell et al., 2002) because, according to Jorm et al., BIs may experience more hardships than LGs. As compared with CHs, our relation between GNBs and distress was much stronger for BIs than for other sexual minorities. BIs may be under greater pressure to monitor and control their GNBs than LGs. A study of adults found that BIs were more likely to have heterosexual friends whereas LGs were more likely to have LG friends (Galupo, 2007). To the extent the study generalizes to young people, it suggests that the increasing monitoring and control linked to increasing GNBs among BIs should be related to more distress directly or, as suggested by others (Pachankis, 2007), through indirect pathways. Although the LGs reported the highest levels of GNBs of all sexual-orientation groups, the relation between childhood GNBs and current distress was weak, perhaps because of the relative freedom of gender nonconforming expression in LG communities.

This argument, that BIs may be at greater risk for distress than LGs because of their childhood GNBs and greater likelihood of having heterosexual friends than (as is the case for LGs) LG friends, presumes two things. First, it presumes that childhood GNBs have implications for subsequent GNBs. Indeed, a behavioral examination of GNBs based on home videos taped during childhood found that the observed childhood GNBs were related to self-reports and observations by others of the individuals' GNBs during adulthood (Rieger et al., 2008). The consistency of GNBs over time was also found in a study of high school students in which self-reports of childhood and adolescent GNBs were assessed (Rieger & Savin-William, 2012). Lastly, the argument presumes that many of our LG young people had access to LG communities. This seems plausible because they were, on average, in their early 20s.

Second, methodological considerations and naturally occurring changes over time may account for the attenuated relations found between stress and distress, particularly with respect to maternal discomfort with homosexuality. Although mothers' discomfort with homosexuality was related to lower levels of depressive distress in their children, suggesting that more accepting maternal attitudes were related to more distress, the finding was quite small and attributed to CHs. For the sexual minorities, the relations between maternal attitudes and depressive distress were non-significant. The moderating effects of maternal attitudes in depressive disparities by sexual orientation also were non-significant. We cannot determine whether these null findings either were due to mothers' misrepresentation (e.g., providing socially desirable responses), especially as we did not ask the children about their mothers' attitudes, or to mothers differing on the extent to which they may have adjusted to the minority sexual identity of their children by the time they were queried about their attitudes. Unfortunately, we did not assess whether the mother was aware of the young individual's sexual-minority orientation.

Third, our measures of stress may be too indirect and it is their indirectness that accounts for the null findings. Neither maternal discomfort with homosexuality nor GNBs are direct indicators of more common notions of stress, such as discrimination or abuse. Consequently, future studies may want to include and compare more direct and indirect measures, when examining the relations between stress and depressive symptoms.

Sibling (Within-Family) Comparisons

Our hypotheses were confirmed in that sexual minorities as compared with CH siblings reported more depressive distress, less secure attachment, and more childhood GNBs; and, the mothers reported less affection for their sexual-minority than CH offspring. The findings have additional significance when considering the samples: The mothers were nurses. Nevertheless, society's stigmatization of homosexuality seeps even into families with health professionals. Families seem in need of therapeutic or intervention efforts to address the discrimination and psychological deprivation potentially experienced by a sexual-minority member. Such efforts might begin during childhood when GNBs, perhaps the first external markers of a possible sexual-minority orientation, appear (Rieger et al., 2008). The efforts may diminish the distress that leads some sexual-minority individuals to seek treatment later in life.

The within-family comparisons also have implications for future research. They suggest the need for more research to investigate within-family dynamics alongside sexual orientation differences, including but not limited to the role of sex differences, birth order, and number of siblings.

Limitations and Conclusions

In addition to the limitations identified above, the generalizability of our findings requires other studies because the GUTS and NHSII samples were not representative of the population. However, the findings confirmed a theoretical model with a relatively privileged set of individuals.

We proposed and tested a theoretical model to account for health disparities by sexual orientation. The model was generally supported with respect to depressive distress, our marker of health. Attachment explained depressive disparities between sexual minorities and CHs. In addition, some differences from CHs were more pronounced for some than for other sexual-minority groups; potential reasons for such differences were offered for future research to test. Also, the model should be examined with other health outcomes. Ultimately, treatment and intervention trials focusing on attachment processes can be designed to confirm the causal directions implied in the model and reduce the elevated distress experienced by some sexual-minority young people.

Acknowledgments

The GUTS cohort has been funded by the Robert Wood Johnson Foundation and grants HD45763 and HD57368 from the National Institutes of Health. Dr. Corliss is supported by a career development award from National Institute on Drug Abuse (DA23610). Drs. Corliss and Austin are also supported by the Leadership Education in Adolescent Health Project, Maternal and Child Health Bureau, Health Resources and Services Administration grant 6T71-MC00009.

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Figure 1.

Proposed theoretical model of health by sexual orientation and related factors. *Note.* Dotted paths, such as between sexual orientation and health outcome, indicate hypothesized mediated relations. The year construct was assessed appears in parentheses.

Figure 2.

Path analysis ($N = 6,122$). All estimated parameters adjusted for age, sex, race/ethnicity, and sibling clustering. Completely heterosexual is the referent group for the sexual minorities.

Non-significant findings appear in parentheses.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 1

Theoretical Variables and Demographic Characteristics of Female and Male Young People Stratified by Sexual Orientation.

	Lesbian/Gay	Bisexual	Mostly Heterosexual	Completely Heterosexual	Total Sample
Variable (year assessed)	<i>n</i> = 101	<i>n</i> = 101	<i>n</i> = 611	<i>n</i> = 5309	<i>N</i> = 6122
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Female	46 (45.5)**	86 (85.2)***	451 (73.8)***	3360 (63.3)	3943 (64.4)
Male	55 (54.5)	15 (14.8)	160 (26.2)	1949 (36.7)	2179 (35.6)
White	92 (91.1)	85 (84.2)***	551 (90.2)***	5018 (94.5)	5746 (93.9)
Racial/ethnic minority	9 (8.9)	16 (15.8)	60 (9.8)	291 (5.5)	376 (6.1)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Age in years (2005) ^a	21.1 (1.6)**	20.6 (1.5)	20.7 (1.6)*	20.5 (1.7)	20.6 (1.7)
Maternal discomfort with homosexuality (2004) ^a	4.9 (2.1)***	5.0 (2.3)*	5.3 (2.2)***	6.2 (2.1)	6.1 (2.2)
Childhood gender nonconforming behaviors (2005) ^a	10.3 (3.9)***	9.6 (3.0)***	8.5 (2.9)***	7.1 (2.6)	7.4 (2.8)
Attachment (2005) ^a	35.2 (7.9)***	33.9 (8.9)***	35.3 (8.3)***	38.2 (6.8)	37.8 (7.1)
Maternal affection (2006) ^a	37.0 (7.0)**	36.6 (7.0)**	37.6 (6.8)***	38.9 (6.3)	38.7 (6.4)
Depressive distress (2007) ^a	8.8 (4.6)*	10.2 (5.2)***	9.7 (5.3)***	7.7 (4.8)	8.0 (4.9)

Note. Sexual orientation reported in 2005. Sibling-adjusted linear models were used to estimate mean differences by sexual orientation. Sibling-adjusted logit models were used to estimate proportional differences across sex and race/ethnicity by sexual orientation. Completely heterosexual is the referent category for all comparisons.

^aThe variables' scores ranged from: 17 to 25 years for age, 2 to 10 for maternal discomfort with homosexuality, 4 to 20 for childhood gender nonconforming behaviors, 9 to 45 for attachment, 9 to 45 for maternal affection, and, 0 to 30 for depressive distress.

*
 $p < .05$

**
 $p < .01$

 $p < .0001$

Table 2Bivariate Relations: z-scored Beta Coefficients and 95% Confidence Intervals ($N = 6,122$).

	Maternal discomfort with homosexuality (2004)	Childhood gender nonconforming behaviors (2005)	Attachment (2005)	Maternal affection (2006)	Depressive distress (2007)
Lesbian/gay	-0.14 (-0.20, -0.08) ***	1.15 (0.88, 1.42) ***	-0.43 (-0.64, -0.22) **	-0.30 (-0.52, -0.09) **	0.23 (0.05, 0.42) *
Bisexual	-0.11 (-0.20, -0.01) *	0.88 (0.66, 1.09) ***	-0.61 (-0.86, -0.37) ***	-0.35 (-0.57, -0.13) **	0.51 (0.30, 0.72) ***
Mostly heterosexual	-0.09 (-0.11, -0.07) ***	0.51 (0.42, 0.60) ***	-0.41 (-0.50, -0.31) ***	-0.21 (-0.29, -0.12) ***	0.41 (0.32, 0.50) ***
Maternal discomfort with homosexuality	--	-0.06 (-0.08, -0.03) ***	-0.03 (-0.06, -0.005) *	-0.06 (-0.09, -0.03) ***	-0.06 (-0.08, -0.03) ***
Childhood gender Nonconforming behaviors	--	--	-0.06 (-0.08, -0.03) ***	0.02 (-0.004, 0.05)	0.09 (0.07, 0.12) ***
Attachment	--	--	--	0.47 (0.44, 0.49) ***	-0.20 (-0.23, -0.18) ***
Maternal affection	--	--	--	--	-0.13 (-0.16, -0.11) ***
Demographic Characteristics:					
Age in years (2005)	-0.006 (-0.01, 0.001)	0.02 (-0.009, 0.04)	0.001 (-0.02, 0.03)	0.05 (0.03, 0.07) ***	-0.05 (-0.07, -0.02) **
Sex (male vs. female)	-0.006 (-0.02, 0.009)	-0.89 (-0.93, -0.84) ***	0.02 (-0.03, 0.07)	-0.17 (-0.22, -0.12) ***	-0.13 (-0.18, -0.07) ***
Race/ethnicity (White vs. minority)	0.04 (-0.003, 0.09)	-0.05 (-0.16, 0.06)	0.16 (0.06, 0.27) **	0.18 (0.07, 0.29) **	-0.07 (-0.18, 0.04)

Note. Each estimated beta coefficient was adjusted for sibling clustering. Sexual orientation was reported in 2005. The referent for each sexual orientation category is completely heterosexual (CH), such that the CH group is coded zero and each sexual-minority group is coded one. For continuous variables, the name of each variable identifies the direction of high scores. Relations involving binary variables (sexual orientation, sex, and race/ethnicity) can be interpreted as Cohen's d , the standard deviation difference between one group and another (e.g., lesbians/gays to CHs) on each continuous variable. Relations among continuous variables are interpretable as traditional beta weights, ranging from -1.0 to 1.0. For dichotomous covariates (coded 0 and 1), young men and Whites were coded 1.

*
 $p < .05$

**
 $p < .01$

 $p < .0001$

Table 3

Adjusted Relations among Variables in the Theoretical Model: Z-scored Beta Coefficients and 95% Confidence Intervals ($N = 6,122$).

	Maternal discomfort with homosexuality (2004)	Childhood gender nonconforming behaviors (2005)	Attachment (2005)	Maternal affection (2006)	Depressive distress (2007)
Lesbian/gay	−0.13 (−0.19, −0.07) ***	1.31 (1.05, 1.58) ***	−0.43 (−0.64, −0.21) ***	−0.28 (−0.50, −0.07) *	0.27 (0.08, 0.45) **
Bisexual	−0.10 (−0.19, −0.01) *	0.68 (0.47, 0.90) ***	−0.60 (−0.84, −0.36) ***	−0.38 (−0.59, −0.16) **	0.48 (0.27, 0.69) ***
Mostly heterosexual	−0.09 (−0.11, −0.06) ***	0.42 (0.33, 0.50) ***	−0.40 (−0.50, −0.31) ***	−0.22 (−0.31, −0.14) ***	0.41 (0.32, 0.50) ***
Maternal discomfort with homosexuality	--	−0.06 (−0.08, −0.03) ***	−0.03 (−0.06, −0.007) *	−0.06 (−0.09, −0.03) ***	−0.06 (−0.08, −0.03) ***
Childhood gender Nonconforming behaviors	--	--	−0.06 (−0.09, −0.03) ***	−0.02 (−0.04, 0.01)	0.08 (0.06, 0.11) ***
Attachment	--	--	--	0.47 (0.44, 0.49) ***	−0.20 (−0.23, −0.17) ***
Maternal affection	--	--	--	--	−0.14 (−0.16, −0.11) ***

Note. Each estimated beta coefficient was adjusted for age, sex, race/ethnicity, and sibling clustering. Sexual orientation was reported in 2005. The referent for each sexual orientation category is completely heterosexual (CH), such that the CH group is coded zero and each sexual-minority group is coded one. For continuous variables, the name of each variable identifies the direction of high scores. Relations involving sexual orientation can be interpreted as Cohen's d , the standard deviation difference between a sexual-minority group and CH on each continuous variable. Relations among continuous variables are interpretable as traditional beta weights, ranging from −1.0 to 1.0.

*
 $p < .05$

**
 $p < .01$

 $p < .0001$

Table 4

Path Analytic Findings for Major Outcomes: Z-scored Beta Coefficients and 95% Confidence Intervals ($N = 6,122$).

	Model 1 Depressive distress	Model 2 Attachment	Model 3 Maternal affection	Model 4 Depressive distress
Lesbian/gay	0.27 (0.08, 0.45) **	-0.42 (-0.63, -0.20) **	-0.14 (-0.33, 0.05)	0.09 (-0.10, 0.27)
Bisexual	0.48 (0.27, 0.69) ***	-0.61 (-0.85, -0.36) ***	-0.14 (-0.32, 0.05)	0.31 (0.10, 0.52) **
Mostly heterosexual	0.41 (0.32, 0.50) ***	-0.41 (-0.51, -0.31) ***	-0.06 (-0.14, 0.02)	0.29 (0.20, 0.40) ***
Maternal discomfort with homosexuality	--	-0.06 (-0.08, -0.03) ***	-0.05 (-0.07, -0.02) ***	-0.05 (-0.07, -0.02) **
Childhood gender nonconforming behaviors	--	-0.03 (-0.06, -0.003) *	0.02 (-0.008, 0.04)	0.05 (0.02, 0.08) **
Attachment	--	--	0.46 (0.43, 0.49) ***	-0.16 (-0.19, -0.13) ***
Maternal affection	--	--	--	-0.06 (-0.09, -0.03) **
Demographic covariates:				
Age in years (2005)	-0.05 (-0.08, -0.03) ***	0.007 (-0.02, 0.03)	0.05 (0.03, 0.07) ***	-0.05 (-0.07, -0.03) ***
Sex (male vs. female)	-0.11 (-0.16, -0.06) ***	-0.03 (-0.08, 0.03)	-0.17 (-0.22, -0.11) ***	-0.07 (-0.13, -0.02) *
Race/ethnicity (White vs. minority)	-0.03 (-0.14, 0.08)	0.12 (0.02, 0.23) *	0.10 (-0.004, 0.20)	0.001 (-0.11, 0.11)

Note. Beta coefficients adjusted for all other variables in the equation and sibling clusters. Completely heterosexual is the referent group, as such they are coded as zero and each sexual-minority group is coded as one. For dichotomous covariates (coded 0 and 1), young men and Whites were coded one.

*
 $p < .05$

**
 $p < .01$

 $p < .0001$

Table 5Mean Comparisons of Sexual Minorities and Completely Heterosexual Siblings ($n = 183$ families).

	Lesbian/gay, bisexual, mostly heterosexual <i>M</i> (<i>SD</i>)	Completely heterosexual <i>M</i> (<i>SD</i>)	Mean difference (95% CL mean)	<i>df</i>	paired <i>t</i> - test	Cohen's <i>d</i>
Total Sibling Sample						
Depressive distress ^a	9.69 (4.94)	7.61 (3.81)	2.55 (1.75, 3.34)	182	6.30***	0.47
Attachment	34.61 (8.55)	38.20 (5.70)	-2.92 (-1.52, -4.33)	182	-4.10***	-0.49
Maternal affection	36.75 (6.76)	38.95 (5.24)	-1.89 (-0.72, -3.05)	182	-3.19**	-0.36
Childhood gender nonconforming behaviors	8.91 (3.02)	6.95 (2.01)	1.87 (1.31, 2.42)	182	6.66***	0.76
Females and Same-Sex Siblings						
Depressive distress	10.27 (5.17)	7.95 (4.02)	2.14 (0.86, 3.42)	75	3.33**	0.50
Attachment	32.85 (9.15)	38.17 (6.13)	-4.92 (-7.19, -2.65)	75	-4.31***	-0.68
Maternal affection	36.37 (6.97)	39.36 (5.31)	-2.36 (-4.32, -0.40)	75	-2.40*	-0.48
Childhood gender nonconforming behaviors	9.37 (3.18)	7.85 (2.02)	1.43 (0.61, 2.24)	75	3.49**	0.57
Males and Same-Sex Siblings						
Depressive distress	9.27 (4.76)	7.15 (3.57)	3.50 (1.64, 5.36)	29	3.85**	0.50
Attachment	35.99 (6.47)	37.92 (5.18)	-0.42 (-3.43, 2.59)	29	-0.29	-0.33
Maternal affection	37.70 (5.79)	38.01 (5.21)	0.55 (-2.08, 3.18)	29	0.42	-0.06
Childhood gender nonconforming behaviors	7.33 (2.22)	5.37 (1.39)	1.53 (0.56, 2.51)	29	3.21**	1.06

Note. In the 183 families, 77 families did not have a same-sex sibling. In the families with a same-sex sibling, there were 205 sexual-minority and 942 completely heterosexual (CH) siblings. In the 76 families with female sexual-minority and same-sex siblings, there were 90 sexual minorities and 390 CH siblings. In the 30 families with male sexual-minority and same-sex siblings, there were 32 sexual minorities and 184 CH siblings.

^aThe variables' scores ranged from: 0 to 30 for depressive distress; 9 to 45 for attachment; 9 to 45 for maternal affection; and 0 to 20 for childhood gender nonconforming behaviors.

*
 $p < 0.05$

**
 $p < .005$

 $p < .0001$