

# Emotion regulation and internalizing symptoms in a longitudinal study of sexual minority and heterosexual adolescents

Mark L. Hatzenbuehler, Katie A. McLaughlin, and Susan Nolen-Hoeksema

Yale University, USA

**Background:** Sexual minority adolescents appear to be at increased risk for internalizing disorders relative to their heterosexual peers, but there is a paucity of research explaining this elevated risk. Emotion regulation deficits are increasingly understood as important predictors of internalizing psychopathology among general samples of adolescents. The present study sought to examine whether deficits in emotion regulation could account for disparities in internalizing symptoms between sexual minority and heterosexual adolescents. **Methods:** The present study utilized longitudinal data from a racially/ethnically diverse (68% non-Hispanic Black and Hispanic/Latino) community sample of 1,071 middle school students (ages 11–14). **Results:** Adolescents who endorsed same-sex attraction evidenced higher rates of internalizing symptoms at both time points. Structural equation modeling indicated that sexual minority adolescents exhibited greater deficits in emotion regulation (rumination and poor emotional awareness) than their heterosexual peers. Emotion regulation deficits in turn mediated the relationship between sexual minority status and symptoms of depression and anxiety. **Conclusions:** The results demonstrate the importance of considering normative psychological processes in the development of internalizing symptomatology among sexual minority adolescents, and suggest emotion regulation deficits as specific targets of prevention and intervention efforts with this population. Future studies are needed to determine whether stigma-related stressors are responsible for emotion regulation deficits among sexual minority youth. **Keywords:** Depression, anxiety, emotion regulation, sexual minority youth.

Epidemiological research has indicated that sexual minority adults are at increased risk for internalizing disorders, including major depression (Cochran & Mays, 2000; Cochran, Mays, & Sullivan, 2003; Gilman, Cochran, Mays, Ostrow, & Kessler, 2001; Sandfort, de Graaf, Bijl, & Schnabel, 2001) and anxiety disorders (Cochran & Mays, 2000; Cochran et al., 2003; Gilman et al., 2001; Sandfort et al., 2001). A recent meta-analysis found that sexual minority individuals are twice as likely as heterosexuals to have a lifetime mood disorder, and 1.87 times more likely to have a lifetime anxiety disorder (Meyer, 2003). Similar findings exist for externalizing disorders (Burgard, Cochran, & Mays, 2005; Cochran, Keenan, Schober, & Mays, 2000; Drabble, Midanik, & Trocki, 2005).

Although research on the mental health of sexual minority youth is lacking relative to adults, sexual minority adolescents also appear to be at increased risk for both externalizing (Garofalo, Wolf, Kessel, Palfrey, & DuRant, 1998; Hatzenbuehler, Corbin, & Fromme, 2008; Russell, Driscoll, & Truong, 2002) and internalizing disorders. Indeed, recent studies with comparison groups and nationally representative or community samples have documented that sexual minority adolescents are at elevated risk for depressive symptoms compared with their hetero-

sexual peers (D'Augelli, 2002; Fergusson, Horwood, & Beautrais, 1999; Fergusson, Horwood, Ridder, & Beautrais, 2005; Russell & Joyner, 2001; Safren & Heimberg, 1999). The few studies that have examined anxiety symptoms have also found them to be elevated among sexual minority youth relative to heterosexuals (e.g., Fergusson et al., 1999; Lock & Steiner, 1999).

Despite the growing evidence that there is an increased risk of internalizing symptoms among sexual minority adolescents, the determinants of this elevated risk remain inadequately understood. Although gay-related stressors are likely to be contributors to internalizing symptoms among sexual minority adolescents (e.g., Rosario, Rotheram-Borus, & Reid, 1996), researchers are increasingly interested in understanding the role of normative psychological processes that have been shown to predict mental health problems in general samples of adolescents (Diamond, 2003; Savin-Williams, 2001). Such information will facilitate the development of evidence-based preventive interventions that seek to reduce the prevalence of psychiatric morbidity among sexual minority youth. With rare exception (e.g., Safren & Heimberg, 1999), however, established psychological processes have not been examined as mediators of the relationship between sexual orientation status and psychopathological outcomes among sexual minority adolescents.

Conflict of interest statement: No conflicts declared.

© 2008 The Authors

Journal compilation © 2008 Association for Child and Adolescent Mental Health.

Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA

The present study sought to address this gap in the literature. Specifically, we focused on emotion regulation deficits as predictors of elevated internalizing symptoms in sexual minority adolescents. Emotion regulation refers to the processes involved in monitoring, evaluating, and modifying emotional reactions in the pursuit of one's goals (Thompson, 1994). The adaptive regulation of emotions is a principal developmental task during adolescence (Steinberg et al., 2006; Zeman, Cassano, Perry-Parrish, & Stegall, 2006), and considerable individual variability exists in the extent to which youth acquire adaptive strategies for managing their emotions (Saarni, 1999). Emotion regulation deficits are increasingly understood as important predictors of internalizing psychopathology among general samples of adolescents. For example, children and adolescents with anxiety disorders have been found to have poorer emotional understanding, to experience negative emotions with greater intensity, to have more difficulty managing negative emotions, and to have lower confidence in their ability to manage their emotions than non-anxious youth (Southam-Gerow & Kendall, 2000; Suveg & Zeman, 2004). Adolescent depression has also been linked to poor emotion regulation skills (Abela, Brozina, & Haigh, 2002; Garber, Braafladt, & Weiss, 1995; Silk, Steinberg, & Morris, 2003).

Taken together, prior research therefore suggests that emotion regulation deficits might account for increased levels of internalizing symptomatology among sexual minority adolescents. However, no study has examined maladaptive emotion regulation as a predictor of the development of depression and anxiety symptoms in this population. The current investigation therefore had three primary aims. First, given the paucity of community-based samples of sexual minority adolescents including a heterosexual comparison group, the study sought to determine whether mental health disparities emerged in internalizing symptomatology between sexual minority adolescents and their heterosexual peers. We hypothesized that the sexual minority adolescents would report increased levels of depressive and anxiety symptoms. Second, we aimed to evaluate emotion regulation deficits as longitudinal predictors of these internalizing symptoms. Third, we examined emotion regulation deficits as mediators of the relationship between sexual minority status and internalizing symptomatology. We hypothesized that deficits in emotion regulation would account for disparities in the development of internalizing symptoms between sexual minority and heterosexual adolescents.

## Method

### Participants

The sample was recruited from the total enrollment (approximately 1,500 students) of two middle schools

(Grades 6–8) from one school district in central Connecticut. The community in which the schools are located is a small urban community (metropolitan population of 71,538). Schools were chosen for the study based on the demographic characteristics of the school district and their willingness to participate in the study. The overall participation rate in the study was 72.0%.

The sample included 51.2% ( $N = 545$ ) males and 48.8% ( $N = 520$ ) females. Participants were evenly distributed across grade level with 31.8% ( $N = 337$ ) of participants in the sixth grade, 33.9% ( $N = 360$ ) in the seventh grade, and 34.3% ( $N = 364$ ) in the eighth grade at the time of the study. The race/ethnicity composition of the sample was as follows: 13.2% ( $N = 141$ ) non-Hispanic White, 11.8% ( $N = 126$ ) non-Hispanic Black, 56.9% ( $N = 610$ ) Hispanic/Latino, 2.2% ( $N = 24$ ) Asian/Pacific Islander, .2% ( $N = 2$ ) Native American, .8% ( $N = 9$ ) Middle Eastern, 9.3% ( $N = 100$ ) Biracial or Multiracial, and 4.2% ( $N = 45$ ) reported being members of other racial/ethnic groups. A small percentage of participants, 1.3% ( $N = 14$ ), declined to provide information on their racial/ethnic background. The majority of adolescents within the Hispanic group were of Puerto Rican, Mexican, and Cuban descent. Approximately 14% of the Hispanic group reported ethnic backgrounds from elsewhere in Central and South America, and 5.7% of participants in this group were born outside of the United States. Participants who reported living in single-parent households accounted for 27.4% ( $N = 293$ ).

We did not ask the students to report on their family income because the validity of their reports was unlikely to be high. However, the community in which the participating middle schools reside is a uniformly lower SES community, with a per capita income of \$18,404 (Connecticut Department of Education, 2006 based on data from 2001). School records indicated that 62.3% of students qualified for free or reduced lunch in the 2004–2005 school year.

### Measures

*Same-sex attraction.* Our measure of sexual minority status consisted of endorsing same-sex attraction. Students were asked, 'Have you ever had a romantic attraction to a boy?' and 'Have you ever had a romantic attraction to a girl?' This question was chosen because it was used in the National Longitudinal Study of Adolescent Health (Add Health Study), a large epidemiologic study utilizing a national sample of students in grades 7–12 (Bearman, Jones, & Udry, 1997; Russell & Joyner, 2001). In addition, this question was considered developmentally appropriate given the young age of our sample in which many (if not most) youth do not yet identify themselves as lesbian, gay, or bisexual (Savin-Williams & Diamond, 2001). Importantly, same-sex attraction is highly correlated with other common indicators of sexual orientation, including sexual behavior and self-identification (Laumann, Gagnon, Michael, & Michaels, 1994; Weinrich et al., 1993).

Twenty-nine students (9 boys, 20 girls; 2.3% of the sample) endorsed having same- or both-sex attractions, and will be referred to as the sexual minority group. Consistent with results from the Add Health Study (Russell, Franz, & Driscoll, 2001), more youth reported

attraction to both sexes ( $N = 23$ ) than to the same sex exclusively ( $N = 6$ ). The race/ethnicity composition of the sexual minority sample was as follows: 6.9% ( $N = 2$ ) non-Hispanic White, 6.9% ( $N = 2$ ) non-Hispanic Black, 65.5% ( $N = 19$ ) Hispanic/Latino, 10.3% ( $N = 2$ ) Biracial or Multiracial, and 10.3% ( $N = 3$ ) reported being members of other racial/ethnic groups.

### Psychopathology outcomes

**Depression.** The Children's Depression Inventory (CDI; Kovacs, 1992) is the most widely used self-report measure of depressive symptoms in children and adolescents. The CDI is a 27-item self-report measure of depressive symptoms that has been standardized on children and adolescents aged 7 to 17 years. The CDI has sound psychometric properties, including internal consistency (Reynolds, 1994), test-retest reliability, and discriminant validity (Kovacs, 1992). The CDI has also been demonstrated to reliably identify children and adolescents with major depression and to differentiate children with major depression from those with an anxiety disorder or disruptive behavior disorder (Timbremont, Braet, & Dreessen, 2004). The item pertaining to suicidal ideation was removed from the measure at the request of school officials and the human subjects committee. The CDI demonstrated good reliability in the sample as a whole ( $\alpha = .82$ ) and within both heterosexuals ( $\alpha = .82$ ) and sexual minorities ( $\alpha = .83$ ).

**Anxiety.** The Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997) is a 39-item measure which is the most widely used measure of anxiety in children. The MASC assesses physical symptoms of anxiety, harm avoidance, social anxiety, and separation anxiety and is appropriate for children ages 8 to 19. The MASC has high internal consistency and test-retest reliability across 3-month intervals, good convergent validity with other measures of child and adolescent anxiety, and divergent validity with measures of unrelated psychopathology (Muris, Merckelbach, Ollendick, King, & Bogie, 2002). The MASC correlates more strongly with other anxiety measures than measures of depression, and it differentiates between anxious children, control children, and children with other types of psychopathology (March, Sullivan, & Parker, 1999). The MASC demonstrated good reliability in the sample as a whole ( $\alpha = .88$ ) and within both heterosexuals ( $\alpha = .88$ ) and sexual minorities ( $\alpha = .86$ ).

### Emotion regulation mediators

**Emotional awareness.** Accurate recognition of one's own emotions is a prerequisite for effective management of emotional reactions and must occur before emotional information can be used to guide behavior. Poor emotional awareness and understanding have been linked to internalizing symptoms in children and adolescents (Silk et al., 2003; Southam-Gerow & Kendall, 2000).

We used the emotional awareness subscale of the Emotion Expression Scale for Children (EESC; Penza-Clyve & Zeman, 2002), a 16-item measure designed to assess extrinsic processes of emotion regulation.

Representative items from this scale include 'I have feelings that I can't figure out,' and 'I often do not know how I am feeling.' The EESC has high internal consistency and moderate test-retest reliability, and the construct validity of the measure has been established (Penza-Clyve & Zeman, 2002). The EESC demonstrated good reliability in the sample as a whole ( $\alpha = .88$ ), as well as within heterosexual ( $\alpha = .87$ ) and sexual minority ( $\alpha = .91$ ) subgroups.

**Rumination.** One way in which some individuals typically respond to their sad mood is through rumination, which is defined as a passive and repetitive focus on one's symptoms of distress and the circumstances surrounding these symptoms (Nolen-Hoeksema, 2000). There is a large body of literature linking maladaptive responses to dysphoric mood, such as rumination, to the development of depressive and anxiety symptoms in both adolescent and adult samples (Abela et al., 2002; Nolen-Hoeksema, 2000; Nolen-Hoeksema & Morrow, 1991).

We used the Children's Response Styles Questionnaire (CRSQ; Abela et al., 2002), a 25-item measure that assesses children's responses to depressed mood. The measure is modeled after the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991) that was developed for adults. The present study focused specifically on the rumination subscale, which assesses the extent to which children respond to sad feelings with rumination (i.e., self-focused thought concerning the causes and consequences of depressed mood). The reliability and validity of the CRSQ, as well as each of the subscales, have been demonstrated in several studies (Abela et al., 2002). The CRSQ demonstrated good reliability in the sample as a whole ( $\alpha = .86$ ), as well as within both of the sexual orientation groups: heterosexual ( $\alpha = .86$ ) and sexual minority ( $\alpha = .81$ ).

### Procedure

Data were collected during the homeroom and first period of the school day on two consecutive days. Participants were given 90 minutes on each day to complete the assessments. Seven months elapsed between the baseline (November 2005) and follow-up assessments (May 2006). The assessments were administered to students in their homeroom classrooms, and homeroom teachers along with one study personnel were present in the classroom during the assessment period. Questionnaires were read aloud to students for whom English was a second language. The parents of all eligible children in the participating middle schools were asked to provide active consent for their children to participate in the study. In addition, before completing the assessments, the children signed consent forms which assured them of the confidentiality of their responses and the voluntary nature of their participation. The study was conducted in compliance with the Yale Institutional Review Board.

### Data analysis

Data were excluded for 4 heterosexual students (.7% of the sample) whose patterns of responding indicated



that they were not answering the questions truthfully (e.g., indicating that two mutually exclusive events had occurred) or that they were not reading the questions before responding (e.g., marking consecutive numbers repeatedly throughout the assessment, such as 1, 2, 3, 4, etc.). A sample of 1,071 adolescents participated in the baseline assessment and was included in the cross-sectional analyses of differences in symptomatology between sexual minority and heterosexual adolescents at baseline; 854 (79.74%) of these students participated in the follow-up assessment and were included in all longitudinal and mediational analyses. All sexual minority participants were present for the baseline and follow-up assessments and were therefore included in both the cross-sectional and longitudinal analyses.

Structural equation modeling (SEM) was used to test the mediation analyses. These analyses were conducted using AMOS 6.0 software (Arbuckle, 2005). Analyses were conducted using the full information maximum likelihood estimation method in AMOS, which estimates means and intercepts to handle missing data.

Procedures outlined by Baron and Kenny (1986) were utilized to evaluate the hypothesis that emotion regulation deficits mediate the relationship between same-sex attraction and symptoms of depression and anxiety over time. The mediation analyses proceeded as follows: (1) Same-sex attraction was assessed as a predictor of time 2 depression and anxiety symptoms, controlling for initial symptom levels; (2) Same-sex attraction was assessed as a predictor of emotion regulation deficits, which was a latent variable comprised of rumination and poor emotional awareness; (3) Emotion regulation deficits were evaluated as predictors of depressive and anxiety symptoms at the follow-up assessment, after controlling for initial symptom levels; (4) The full mediation model was tested in order to evaluate the hypothesis that emotion regulation deficits mediated the relationship between sexual minority status and depressive and anxious symptomatology. Sobel's *z*-test (Sobel, 1982) determined whether there were significant mediation effects.

## Results

### Descriptive statistics

Table 1 summarizes the group differences in depressive and anxiety symptoms, as well as in emotion regulation characteristics. Sexual minority

adolescents endorsed greater levels of anxiety and depression symptomatology than their heterosexual peers at both time points. In addition, sexual minority adolescents exhibited increased tendencies to ruminate and had poorer emotional awareness at both baseline and follow-up assessments.

Table 2 summarizes zero-order correlations between same-sex attraction, emotion regulation, and internalizing symptoms at baseline. These analyses reveal small-to-moderate relationships between all study variables. In particular, the large correlation between rumination and emotional awareness ( $r = .59$ ) supported the formation of a latent emotion regulation construct with these two variables.

### Structural equation modeling (SEM)

**Depression.** The data supported the first three conditions for demonstrating mediation: (1) Same-sex attraction predicted time 2 depressive symptoms, controlling for time 1 depression scores ( $\beta = .05$ ,  $p = .04$ ); (2) Same-sex attraction was associated with emotion regulation deficits at time 1 ( $\beta = .09$ ,  $p = .04$ ); and (3) Baseline values of emotion regulation predicted depressive symptoms at time 2, controlling for time 1 depressive symptoms ( $\beta = .19$ ,  $p < .001$ ).

In the full mediation model, same-sex attraction was no longer a significant predictor of depressive symptoms when emotion regulation deficits and time 1 depression scores were controlled for. The model (shown in Figure 1) fit the data very well: goodness-of-fit  $\chi^2$  (3,  $N = 854$ ) = 8.51,  $p = .04$ , normed fit index (NFI) = .989, comparative fit index (CFI) = .993, root-mean square error of approximation (RMSEA) = .038. A one-tailed Sobel test found a significant indirect effect of same-sex attraction through emotion regulation deficits,  $z = 2.23$ ,  $p = .01$ . The model accounted for 57% of the variance of depressive symptoms.

**Anxiety.** The data also supported the first three conditions for demonstrating mediation for anxiety symptoms: (1) Same-sex attraction predicted changes in total anxiety symptoms, controlling for time 1

**Table 1** Descriptive statistics for internalizing symptoms and emotion regulation

Measure	Baseline			Follow-up		
	Sexual orientation		Effect size ( $\eta^2$ )	Sexual orientation		Effect size ( $\eta^2$ )
SSA ( $N = 29$ )	Heterosexual ( $N = 1042$ )	SSA ( $N = 29$ )		Heterosexual ( $N = 825$ )		
CDI	13.14(6.62)	9.57(6.41)**	.01	18.10(3.35)	16.16(3.39)**	.01
MASC	46.0(14.42)	40.03(15.40)*	.01	44.97(14.25)	34.51(18.07)**	.01
CRSQ	14.0(7.85)	10.86(7.62)*	.01	16.31(10.11)	10.0(7.94)**	.02
EESC	21.92(8.62)	18.59(6.96)*	.01	23.0(7.19)	18.25(7.44)**	.01

Note. SSA = Same-sex attraction, CDI = Children's Depression Inventory, MASC = Multidimensional Anxiety Scale for Children, CRSQ = Children's Response Styles Questionnaire (Rumination Subscale), EESC = Emotion Expression Scale for Children (Poor Emotional Awareness Subscale). Higher scores indicate greater symptomatology and more emotion dysregulation. \* $p < .05$ , \*\* $p < .01$ .

**Table 2** Associations between study variables at baseline

	1	2	3	4	5
1. Same-sex attraction	–	–	–	–	–
2. Depression	.09**	–	–	–	–
3. Anxiety	.10**	.25**	–	–	–
4. Rumination	.13**	.29**	.69**	–	–
5. Emotion awareness	.11**	.25**	.50**	.59**	–

Note. \*\* $p < .01$ .

anxiety symptoms ( $\beta = .06, p = .03$ ); (2) Same-sex attraction was associated with emotion regulation deficits at time 1 ( $\beta = .09, p = .04$ ); and (3) Baseline values of emotion regulation predicted anxiety symptoms at time 2, controlling for time 1 anxiety symptoms ( $\beta = .13, p < .001$ ).

In the full mediation model, same-sex attraction was no longer a significant predictor of anxiety symptoms when emotion regulation deficits and time 1 anxiety scores were controlled for. The model (shown in Figure 2) fit the data very well: goodness-of-fit  $\chi^2 (3, N = 854) = 4.35, p = .23, NFI = .996, CFI = .999, RMSEA = .019$ . A one-tailed Sobel test found a significant indirect effect of same-sex attraction through emotion regulation deficits,  $z = 1.78, p = .04$ . The model accounted for 67% of the variance of anxiety symptoms.

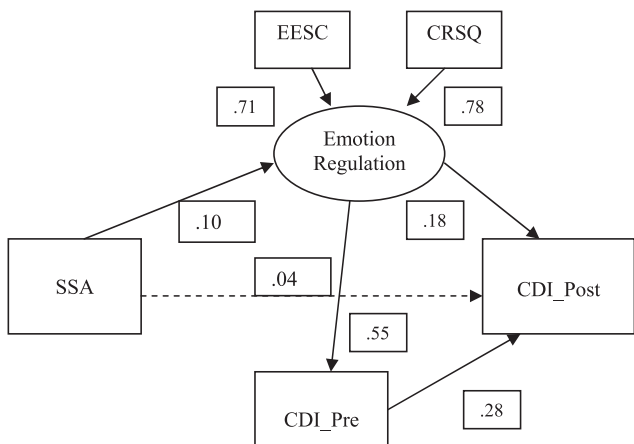
**Discussion**

As hypothesized, sexual minority adolescents reported greater levels of depressive and anxious symptomatology than their heterosexual peers. These mental health disparities existed at baseline, and persisted at the follow-up assessment seven months later. These results confirm prior research documenting increased rates of depression and

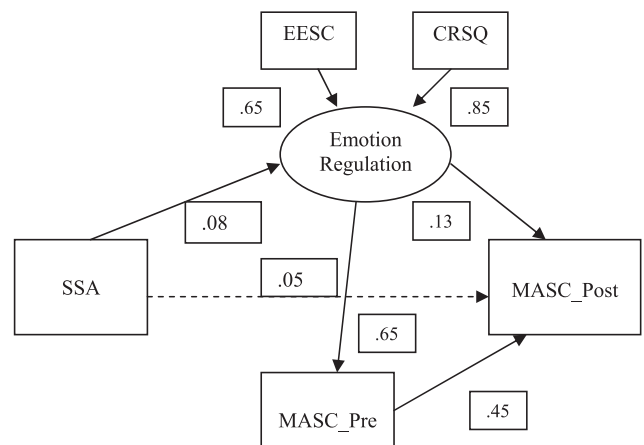
anxiety among sexual minority adolescents (D’Augelli, 2002; Fergusson et al., 1999; 2005; Lock & Steiner, 1999; Russell & Joyner, 2001; Safren & Heimberg, 1999). Most studies with representative samples and heterosexual comparison groups have examined older sexual minority adolescents. Given the younger age cohort assessed in this study (grades 6–8), our results document mental health disparities at increasingly earlier ages for those who endorse same- or both-sex attraction.

The results also indicated that deficits in emotion regulation, which have been consistently associated with internalizing psychopathology among heterosexual adolescents (Abela et al., 2002; Garber et al., 1995; Silk et al., 2003; Southam-Gerow & Kendall, 2000; Suveg & Zeman, 2004), were important predictors of the development of depressive and anxiety symptoms over time among the sexual minority adolescents in this study. In addition, the latent construct of emotion regulation in the SEM analyses, which was comprised of rumination and poor emotional awareness, mediated the relationship between sexual minority status and internalizing symptoms.

These results raise important questions regarding the determinants of emotion regulation deficits among sexual minority adolescents. One possibility is that stress contributes to the development of emotion regulation deficits in sexual minority youth. Chronic stress leads to dysregulated emotions (for reviews, see Cicchetti & Toth, 2005; see also Repetti, Taylor, & Seeman, 2002), and sexual minorities face myriad stressors during adolescence, including peer victimization, physical assault, and rejection from family (for reviews, see Anhalt & Morris, 1998; see also Radkowski & Siegel, 1997). These stressors may occur for a variety of reasons, including rejection following disclosure of a minority sexual



**Figure 1** Final mediation model for depressive symptoms. Note. SSA = Same-sex attraction; EESC = Emotion Expression Scale for Children; CRSQ = Children’s Response Styles Questionnaire; CDI = Children’s Depression Inventory. Numbers represent standardized path coefficients ( $\beta$ ). All paths shown are significant ( $p < .05$ ), except those drawn with broken lines



**Figure 2** Final mediation model for anxiety symptoms. Note. SSA = Same-sex attraction; EESC = Emotion Expression Scale for Children; CRSQ = Children’s Response Styles Questionnaire; MASC = Multidimensional Anxiety Scale for Children. Numbers represent standardized path coefficients ( $\beta$ ). All paths shown are significant ( $p < .05$ ), except those drawn with broken lines

orientation, or behavioral displays of gender non-conformity (e.g., Cohen-Kettenis, Owen, Kaijser, Bradley, & Zucker, 2003). Managing these experiences, in addition to the normative stressors of adolescence, might prevent sexual minorities from developing more adaptive emotional regulation skills relative to their heterosexual peers. Although stressors unique to sexual minority status might result in emotion regulation deficits, none were measured in the current study. Determining the extent to which specific stigma-related stressors are implicated in the development of emotion regulation deficits within sexual minority adolescents remains an important area for future study.

If stigma-related stress is, in fact, responsible for the emotion regulation deficits among sexual minority youths, social-structural-level interventions that decrease prejudice and stigma of these youths should preserve normative, healthy development of emotion regulation in this population. Given that efforts to improve attitudes towards stigmatized groups involve protracted changes over time (Dovidio, Kawakami, & Gaertner, 2000; Link & Phelan, 2001), however, it is essential that the field provides clinical interventions for individuals currently experiencing psychological distress related to stigma. The present study suggests that augmenting emotion regulation skills should be a specific target for preventive interventions with sexual minority youth. This might be accomplished through existing evidence-based protocols, such as emotion-focused therapies, which have shown promise in facilitating more adaptive regulation of emotions (Greenberg, 2002). Resent work has demonstrated that some forms of therapy, in particular cognitive-behavioral therapy, can be flexibly applied to the unique situations confronted by sexual minority individuals (e.g., Safren & Rogers, 2001). Such studies therefore provide an important template for how future interventions can employ evidence-based techniques to address emotion regulation deficits among sexual minority adolescents, which are probable sequelae of the unique stressors that they face.

Although the results of the current study further our understanding of the factors that contribute to disparities in internalizing symptoms among sexual minority adolescents, a number of limitations must be considered in interpreting the findings. First, our use of self-report measures of emotion regulation represents a limitation of the study. Increasingly, measures that do not rely on self-report, such as psychophysiological measures, are being used to assess emotion and emotion regulation (e.g., Gross, 1998). Such measures are useful in experimental settings to examine state changes in emotion and physiological responses, but they are unfeasible for use with large community samples. Moreover, a plethora of prior studies examining emotion regulation and youth psychopathology have relied on self-report measures of emotion regulation

(e.g., Southam-Gerow & Kendall, 2000; Suveg & Zeman, 2004). Second, some of the effects we obtained were small, but reliable. This is likely due to our measurement of sexual minority status. As previously mentioned, the stressors that sexual minority adolescents confront are probable determinants of their emotion regulation deficits. Although same-sex attraction is a reasonable proxy for the experience of these stressors, it is a less reliable indicator than actual measures of stress. Improved measurement of specific stigma-related stressors should therefore increase the magnitude of the associations observed in the current study.

Additional limitations include the relatively small sample size of sexual minority adolescents. Although this did not preclude our ability to detect significant effects, the sample size potentially restricts the generalizability of our findings. Our rate of same-sex attraction was lower than that in the Add Health Study (7.3%; Russell & Joyner, 2001); however, it is important to note that our sample was much younger (grades 6–8) than most of the participants in the Add Health sample, which included adolescents in grades 7–12. Given that self-identification increases among older-age cohorts (Savin-Williams & Diamond, 2001), it is not surprising that a smaller number of participants endorsed same-sex attraction in the present study. In addition, our sample was from a racially/ethnically diverse school district. Some research has indicated that there is greater stigma regarding disclosing same-sex attraction among racial/ethnic minority communities (e.g., Rosario, Schrimshaw, & Hunter, 2004), another factor that might have accounted for the lower rates of same-sex attraction in this study. Finally, the measure of sexual orientation is based on one dimension, that of romantic attraction. Although additional dimensions would be an improvement, this measure captures an important component of adolescent sexuality (Russell & Joyner, 2001), and was appropriate given the age and racial/ethnic diversity of our sample. Nevertheless, it is important to emphasize that 'ever having had a same-sex attraction' is not synonymous with a 'homosexual orientation,' making it difficult to generalize our results to adolescents who are categorized as homosexually oriented. Consequently, future studies would benefit from multiple assessments of sexual orientation, including behavioral and self-identification.

These limitations notwithstanding, there are several methodological advantages to the present study over existing studies of sexual minority adolescents. First, data were drawn from a sample of sexual minority adolescents that is representative of the population from which it was drawn, rather than a convenience sample, which characterizes most sexual minority studies (Anhalt & Morris, 1998; Savin-Williams, 1994). Second, the sexual minority and heterosexual samples were recruited using



identical sampling methods, another rarity in sexual minority research (Diamond, 2003). Third, there is a dearth of longitudinal studies on sexual minority adolescents, especially those with age-matched heterosexual comparison groups, which represents an additional advantage of the present study. Fourth, in contrast to previous studies (e.g., Lock & Steiner, 1999), this study utilized well-validated measures of depressive and anxious symptomatology, which is currently understudied relative to depression.

In addition to these methodological strengths, this study extends the literature on mental health disparities among sexual minority adolescents in several important ways. Multiple studies have documented elevated rates of psychopathology and symptoms of psychological distress within this age group, but there is a paucity of studies examining the mechanisms that can explain this risk, especially those that are not focused on gay-related stressors. To our knowledge, this study was the first to provide longitudinal data on emotion regulation determinants of internalizing symptomatology among sexual minority adolescents. The focus on established affective mechanisms (i.e., emotion regulation deficits) as predictors of the development of internalizing symptomatology over time therefore represents an important advancement in the literature on the pathogenesis of depression and anxiety in this vulnerable population, and suggests future targets for preventive interventions with this group.

## Correspondence to

Mark L. Hatzenbuehler, PO Box 208205, New Haven, CT 06520, USA; Tel: 917-748-7230; Fax: 203-432-7172; Email: mark.hatzenbuehler@yale.edu

## References

- Abela, J.R.Z., Brozina, K., & Haigh, E.P. (2002). An examination of the response styles theory of depression in third- and seventh-grade children: A short-term longitudinal study. *Journal of Abnormal Child Psychology*, *30*, 515–527.
- Anhalt, K., & Morris, T.L. (1998). Developmental and adjustment issues of gay, lesbian and bisexual adolescents: A review of the empirical literature. *Clinical Child and Family Psychology Review*, *1*, 215–230.
- Arbuckle, J.L. (2005). *AMOS 6.0 User's Guide*. Chicago, IL: SPSS, Inc.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Bearman, P.S., Jones, J., & Udry, J.R. (1997). *The national longitudinal study of adolescent health: Research design*. Available at <http://www.cpc.unc.edu/projects/addhealth/design.html>.
- Burgard, S.A., Cochran, S.D., & Mays, V.M. (2005). Alcohol and tobacco use patterns among heterosexually and homosexually experienced women in California. *Drug and Alcohol Dependence*, *77*, 61–70.
- Cicchetti, D., & Toth, T.L. (2005). Child maltreatment. *Annual Review of Clinical Psychology*, *1*, 409–438.
- Cochran, S.D., Keenan, C., Schober, C., & Mays, V.M. (2000). Estimates of alcohol use and clinical treatment needs among homosexually active men and women in the U.S. population. *Journal of Consulting and Clinical Psychology*, *68*, 1062–1071.
- Cochran, S.D., & Mays, V.M. (2000). Relation between psychiatric syndromes and behaviorally defined sexual orientation in a sample of the U.S. population. *American Journal of Epidemiology*, *151*, 516–523.
- 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.
- Cohen-Kettenis, P.T., Owen, A., Kaijser, V.G., Bradley, S.J., & Zucker, K.J. (2003). Demographic characteristics, social competence, and behavior problems in children with gender identity disorder: A cross-national, cross-clinic comparative analysis. *Journal of Abnormal Child Psychology*, *31*, 41–53.
- Connecticut Department of Education. (2006). *Strategic school profile 2005–2006: New Britain public schools*. Hartford, CT: Connecticut Department of Education.
- D'Augelli, A.R. (2002). Mental health problems among lesbian, gay, and bisexual youths ages 14–21. *Clinical Child Psychology and Psychiatry*, *7*, 433–456.
- Diamond, L.M. (2003). New paradigms for research on heterosexual and sexual-minority development. *Journal of Clinical Child and Adolescent Psychology*, *32*, 490–498.
- Drabble, L., Midanik, L.T., & Trocki, K. (2005). Reports of alcohol consumption and alcohol-related problems among homosexual, bisexual, and heterosexual respondents: Results from the 2000 National Alcohol Survey. *Journal of Studies on Alcohol*, *66*, 111–120.
- Dovidio, J.F., Kawakami, K., & Gaertner, S.L. (2000). Reducing contemporary prejudice: Combating explicit and implicit bias at the individual and intergroup level. In S. Oskamp (Ed.), *Reducing prejudice and discrimination* (pp. 137–163). Hillsdale, NJ: Erlbaum.
- Fergusson, D.M., Horwood, L.J., & Beautrais, A.L. (1999). Is sexual orientation related to mental health problems and suicidality in young people? *Archives of General Psychiatry*, *56*, 876–880.
- Fergusson, D.M., Horwood, L.J., Ridder, E.M., & Beautrais, A.L. (2005). Sexual orientation and mental health in a birth cohort of young adults. *Psychological Medicine*, *35*, 971–981.
- Garber, J., Braafladt, N., & Weiss, B. (1995). Affect regulation in depressed and nondepressed children and young adolescents. *Development and Psychopathology*, *7*, 93–115.
- Garofalo, R., Wolf, R.C., Kessel, S., Palfrey, J., & DuRant, R.H. (1998). The association between health-risk behaviors and sexual orientation among a school-based sample of adolescents. *Pediatrics*, *101*, 895–902.
- 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.
- Greenberg, L.S. (2002). *Emotion-focused therapy: Coaching clients to work through their feelings*. Washington, DC: APA.
- Gross, J.J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for expression, experience, and physiology. *Journal of Personality and Social Psychology*, 74, 224–237.
- Hatzenbuehler, M.L., Corbin, W.R., & Fromme, K. (2008). Trajectories and determinants of alcohol use among LGB young adults and their heterosexual peers: Results from a prospective study. *Developmental Psychology*, 44, 81–90.
- Kovacs, M. (1992). *Children's depression inventory manual*. North Tonawanda, NY: Multi-Health Systems.
- Laumann, E.O., Gagnon, J.H., Michael, R.T., & Michaels, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. Chicago, IL: University of Chicago Press.
- Link, B.G., & Phelan, J.C. (2001). Conceptualizing stigma. *Annual Review of Sociology*, 27, 363–385.
- Lock, J., & Steiner, H. (1999). Gay, lesbian and bisexual youth risks for emotional, behavioral and social problems: Results from a community-based survey. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 297–304.
- March, J.S., Parker, J.D.A., Sullivan, K., Stallings, P., & Conners, C.K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and validity. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 554–565.
- March, J.S., Sullivan, K., & Parker, J.D.A. (1999). Test-retest reliability of the multidimensional anxiety scale for children. *Journal of Anxiety Disorders*, 13, 349–358.
- 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.
- Muris, P., Merckelbach, H., Ollendick, T., King, N., & Bogie, N. (2002). Three traditional and three new childhood anxiety questionnaires: Their reliability and validity in a normal adolescent sample. *Behaviour Research and Therapy*, 40, 753–772.
- Nolen-Hoeksema, S. (2000). The role of rumination in depression and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, 109, 504–511.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and distress following a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology*, 61, 105–121.
- Penza-Clyve, S., & Zeman, J. (2002). Initial validation of the emotion expression scale for children (EESC). *Journal of Clinical Child and Adolescent Psychology*, 31, 540–547.
- Radkowski, M., & Siegel, L.J. (1997). The gay adolescent: Stressors, adaptations, and psychosocial interventions. *Clinical Psychology Review*, 17, 191–216.
- Reynolds, W.M. (1994). Assessment of depression in children and adolescents by self-report questionnaires. In W.M. Reynolds, & H.F. Johnston (Eds.), *Handbook of depression in children and adolescents* (pp. 209–234). New York: Plenum Press.
- Repetti, R.L., Taylor, S.E., & Seeman, T.E. (2002). Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin*, 128, 330–366.
- Rosario, M., Rotheram-Borus, M.J., & Reid, H. (1996). Gay-related stress and its correlates among gay and bisexual male adolescents of predominantly Black and Hispanic background. *Journal of Community Psychology*, 24, 136–159.
- Rosario, M., Schrimshaw, E.W., & Hunter, J. (2004). Ethnic/racial differences in the coming-out process of lesbian, gay, and bisexual youths: A comparison of sexual identity development over time. *Cultural Diversity and Ethnic Minority Psychology*, 10, 215–228.
- Russell, S.T., Driscoll, A.K., & Truong, N. (2002). Adolescent same-sex romantic attractions and relationships: Implications for substance use and abuse. *American Journal of Public Health*, 92, 198–202.
- Russell, S.T., Franz, B.T., & Driscoll, A.K. (2001). Same-sex romantic attraction and experiences of violence in adolescence. *American Journal of Public Health*, 91, 903–906.
- 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.
- Saarni, C. (1999). *The development of emotional competence*. New York: The Guilford Press.
- Safren, S.A., & Heimberg, R.G. (1999). Depression, hopelessness, suicidality, and related factors in sexual minority and heterosexual adolescents. *Journal of Consulting and Clinical Psychology*, 67, 859–866.
- Safren, S.A., & Rogers, T. (2001). Cognitive-behavioral therapy with gay, lesbian, and bisexual clients. *Journal of Clinical Psychology*, 57, 629–643.
- Sandfort, T.G., de Graaf, R., Bijl, R.V., & Schnabel, P. (2001). Same-sex sexual behavior and psychiatric disorders: Findings from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Archives of General Psychiatry*, 58, 85–91.
- Savin-Williams, R.C. (1994). Verbal and physical abuse as stressors in the lives of lesbian, gay male, and bisexual youths: Associations with school problems, running away, substance use, prostitution and suicide. *Journal of Consulting and Clinical Psychology*, 62, 261–269.
- Savin-Williams, R.C. (2001). A critique of research on sexual-minority youths. *Journal of Adolescence*, 24, 5–13.
- Savin-Williams, R.C., & Diamond, L.M. (2001). Sexual identity trajectories among sexual-minority youths: Gender comparisons. *Archives of Sexual Behavior*, 29, 607–627.
- Silk, J.S., Steinberg, L., & Morris, A.S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behaviors. *Child Development*, 74, 1869–1880.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290–312). San Francisco: Jossey-Bass.



- Southam-Gerow, M.A., & Kendall, P.C. (2000). A preliminary study of the emotional understanding of youth referred for treatment of anxiety disorders. *Journal of Clinical Child Psychology, 29*, 319–327.
- Steinberg, L., Dahl, R., Keating, D., Kupfer, D.J., Masten, A., & Pine, D. (2006). The study of developmental psychopathology in adolescence: Integrating affective neuroscience with the study of context. In D. Cicchetti, & D. Cohen (Eds.), *Developmental psychopathology, vol. 2: Developmental neuroscience* (pp. 710–741). New York: Wiley.
- Suveg, C., & Zeman, J. (2004). Emotion regulation in children with anxiety disorders. *Journal of Clinical Child and Adolescent Psychology, 33*, 750–759.
- Thompson, R.A. (1994). Emotion regulation: A theme in search of definition. In N. Fox (Ed.), *The development of emotion regulation: Behavioral and biological considerations. Monographs for the Society for Research in Child Development, 59*(2–3, Serial No. 240), 25–52.
- Timbremont, B., Braet, C., & Dreesen, L. (2004). Assessing depression in youth: Relation between the Children's Depression Inventory and a structured interview. *Journal of Clinical Child and Adolescent Psychology, 33*, 149–157.
- Weinrich, J.D., Snyder, P.J., Pillard, R.C., Grant, I., Jacobson, D.L., Robinson, S.R., & McCutchan, J.A. (1993). A factor analysis of the Klein sexual orientation grid in two disparate samples. *Archives of Sexual Behavior, 22*, 157–168.
- Zeman, J., Cassano, M., Perry-Parrish, C., & Stegall, S. (2006). Emotion regulation in children and adolescents. *Developmental and Behavioral Pediatrics, 27*, 155–168.

Manuscript accepted 20 March 2008