Suicide and Life-Threatening Behavior 39(1) February 2009

The Role of Body Image and Disordered Eating as Risk Factors for Depression and Suicidal Ideation in Adolescents

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There is much empirical literature on factors for adolescent suicide risk, but body image and disordered eating are rarely included in these models. In the current study, disordered eating and body image were examined as risk factors for suicide ideation since these factors are prevalent in adolescence, particularly for females. It was hypothesized that disordered eating and body image, in addition to depressive symptoms, would contribute to suicide ideation. It was also hypothesized that these relationships would be stronger for females than for males. Structural equation modeling was used to test a model of risk for suicide ideation incorporating the above factors in a sample of 392 high school students. Results indicated that disordered eating contributed to both suicide ideation and depressive symptoms, while body image only contributed to depressive symptoms. Depressive symptoms contributed to suicide ideation. The model was found to be cross-validated with males and females, and no gender differences emerged. Implications of these findings and their importance in constructing future models of adolescent suicide risk are discussed.

The presence of suicidal ideation and behavior has been recognized as an increasing problem among adolescents and young adults. Suicide has consistently been identified as the third ranking cause of death for young people (Kochanek, Murphy, Anderson, & Scott, 2004). The aim of this study was to gain a better understanding of emotional and behavior factors that put youth at risk for suicidal ideation. A review of previous research suggests that most adolescent risk models for suicide include "traditional" risk factors such as depression and hopelessness (Mazza & Reynolds, 1998). Most risk models do not include factors such as body dissatisfaction and disordered eating, which may be quite relevant for females (Miotto, de Coppi, Frezza, & Preti, 2003). It is also important to examine the role of gender in risk models as differences have been found between males and females in rates of depression (Allgood-Merten, Lewinsohn, & Hops, 1990), suicidal ideation (Rich, Kirkpatrick-Smith, Bonner, & Jans, 1992), suicide attempts, rates of completed suicide (Esposito & Clum, 2003), and body image (Kostanski & Gullone, 1998). There are many potential risk factors that play a role in suicide risk; depression, body image, and disordered eating were chosen in attempts to develop a model that is more pertinent for adolescents, particularly females. This study also included males because very little data has been col-

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lected for this group in terms of body image and disordered eating.

DEPRESSION AND SUICIDE RISK

Numerous studies have found depression and suicide risk to be related in samples of adolescents. Several studies have examined the relationship between depressive symptoms and subsequent suicide risk in longitudinal studies, including Mazza and Reynolds (1998) and Reifman and Windle (1995). Both of these studies found that adolescents who reported depressive symptoms at baseline went on to report suicidal ideation/behaviors up to 1 year later. In another study by Rich et al. (1992), depression was found to be a consistent predictor of suicide behaviors in adolescents overall, but some inconsistencies found were thought to be due to gender differences. Results indicated that females reported significantly higher levels of depression and suicidal ideation than males, and were distinguished from males based on their scores. Depression was found to be a significant predictor of suicidal ideation for both males and females.

BODY IMAGE, DISORDERED EATING, AND DEPRESSION

Body dissatisfaction has been cited as one explanation for the increased rate of depression in female adolescents. Weight satisfaction and weight concerns have been found to positively correlate with and significantly predict depressive symptoms in samples of adolescent girls (Rierdan & Koff, 1997), and depressed adolescents have been found to report a poorer overall body image than nondepressed adolescents (Rierdan, Koff, & Stubbs, 1988). Depressed females have also been found to describe their bodies as uglier, sicker, more out of control, more useless, more boring, less familiar, weaker, and clumsier than nondepressed females (Rierdan, Koff, & Stubbs, 1987).

It has been argued that in addition to female adolescents developing a poor body image and depressive symptoms, these negative feelings could foster dieting and eating-related risk factors. Disordered eating is defined as unhealthy eating behaviors that are considered "subclinical" to eating disorders (Miotto et al., 2003). An estimated 61% of female high school students reported dieting to lose weight in a national survey (Garner, 1997). Although some heavier adolescents may diet for health reasons, it should be noted that dietary restraint during adolescence has been linked with an increased risk for developing eating disorders, specifically bulimia. Shepherd and Ricciardelli (1998) found that body dissatisfaction and dietary restraint were significant predictors for higher scores on a bulimia measure among female high school and university students.

Adolescent females who actively diet or attempt to restrict their eating often experience "failure," which can lead or contribute to depressive symptoms. Stice, Hayward, Cameron, Killen, and Taylor (2000) found that dieting and bulimic symptoms were positively correlated with depressive symptoms. These authors used a longitudinal design and reported that body dissatisfaction, dietary restraint, and bulimic symptoms were significant predictors of subsequent depression. The results suggested that bulimic symptoms are related to depression because of the guilt and shame that are often associated with bingeing and purging. Overall, the roles of dieting and bulimic symptoms play an important part in the relationship between body dissatisfaction and depression. Body dissatisfaction often leads to depressive symptoms, which can lead to disordered and/or restricted eating. Patterns of disordered eating may in turn be followed by feelings of failure, shame, and guilt, which can then contribute to depressive symptoms.

BODY IMAGE, DISORDERED EATING, AND SUICIDE RISK

Eating disorders are among the most widespread disorders associated with the on-

set of adolescence. The estimated prevalence of eating disorders among young people aged 15 to 19 is between 1% and 3%, with 10% of the total cases involving males (Miotto et al., 2003). Individuals with eating disorders have a high lifetime frequency of suicide attempts (e.g., Corcos et al., 2002; Miotto et al., 2003). Corcos et al. reported that between 15% and 40% of bulimic females have attempted suicide at least once, compared to 6.5% and 7% of adolescent girls and adult women who attempted suicide in the general population, respectively. In the Harris and Barraclough (1998) article examining mortality rates of different psychological disorders, substance abuse and eating disorders ranked highest in risk of premature death from both natural and unnatural causes. Neumark-Sztainer, Story, Dixon, and Murray (1998) found that adolescent females who scored above the cut-off on an eating disorder measure reported significantly higher suicidal ideation and more suicide attempts than females who did not engage in extreme weight control behaviors. Miotto et al. further noted that among women struggling with anorexia nervosa, suicide is one of the main causes of death. The risk for suicide in anorexic women is approximately 23 times higher than in the general population.

Suicidal adolescents have been found to report different body attitudes and body experiences than nonsuicidal adolescents. In Orbach, Stein, Shani-Sela, and Har-Even's study (2001), three groups of adolescents were compared on various measures of body attitudes and experience: inpatients who had attempted suicide, inpatients with no suicide history, and a normal control group. Results indicated that the suicidal group reported significantly more negative attitudes and feelings toward the body, less body protection, and more body aberration than the other two groups. These findings may be particularly relevant for females given the high rates of reported body dissatisfaction in this age group.

Miotto et al. (2003) is one of the few studies that have investigated eating disordered behavior as a risk factor for suicide in adolescents, and more importantly, included males in their sample. This study was conducted at several high schools in Italy, and included 950 adolescents between the ages of 15 and 19. Results indicated that females reported significantly higher levels of disordered eating than males. Females who scored above the cutoffs on the eating disorder measures reported significantly more suicidal ideation than females who scored in the normal range on disordered eating symptoms. Both males and females who reported suicidal ideation had significantly higher scores on all measures of eating disorder symptoms.

Poor body satisfaction is a prevalent issue among adolescents, with up to 80% of females and 40% of males reporting dissatisfaction with their bodies (Kostanski & Gullone, 1998). Body dissatisfaction has been shown to be a risk factor for the development of both eating disorders and depression (Shepherd & Ricciardelli, 1998; Thompson, Coovert, Richards, Johnson, & Cattarin, 1995; Tiggemann, 1994). While Miotto et al.'s (2003) study indicated that disordered eating and poor body attitudes were related to suicidal ideation in both males and females, very few studies have included body satisfaction and disordered eating as risk factors for suicidal ideation. Given that body dissatisfaction is so common among adolescents and can lead to serious psychological difficulties, particularly among girls, it seems vital to include these factors in risk models to develop a more comprehensive paradigm of what places youth at risk for suicidal behavior. In this study, we expected disordered eating to directly contribute to increased suicidal ideation, which is a somewhat unique approach. A direct relationship was predicted in attempts to investigate whether or not subclinical eating disorder behaviors had an impact on suicidal ideation in the same way that individuals diagnosed with eating disorders have increased suicide risk. A direct association between disordered eating and suicide ideation would indicate that even subclinical eating disorder behaviors pose psychological risks in addition to physical ones.

We aimed to improve upon some limi-

tations in the adolescent suicide risk literature by developing and testing a structural equation model of risk factors that may be particularly fitting for females. The current study included depression, body image, and disordered eating as factors for suicide risk, which was measured by current suicidal ideation. The model was then tested through cross-group modeling to determine if the data for males or females was a better fit for the model. The structural equation model was expected to be found especially salient for females given the variables included (i.e., body image, disordered eating). Moreover, body-related factors have been underrepresented in adolescent suicide risk models for both genders. The current study aimed to supplement these areas.

A conceptual model for the proposed relationships among risk factors for adolescent suicide is presented in Figure 1. It was hypothesized that the data would fit the proposed model well. Risk factors were conceptualized as likely to predict greater suicide risk, and it was hypothesized that disordered eating and poor body image would contribute to depressive symptoms. Further, it was predicted that depressive symptoms would then contribute to current suicide ideation. We also hypothesized that disordered eating and poor body image would directly contribute to current suicide ideation, and that there would be a significant correlation between disordered eating and body image. Lastly, it was predicted that the model would provide better fit for female participants than for males.

METHOD

Participants

Data from 392 American high school students were collected as part of an ongoing mental health screening conducted at a public high school. The study had IRB approval from the first author's university. The mean age of the sample was 15.04 ($SD = 1.05$) and there was a fairly equal gender distribution (52% males). The majority of the participants were freshmen (67.3%), while the re-

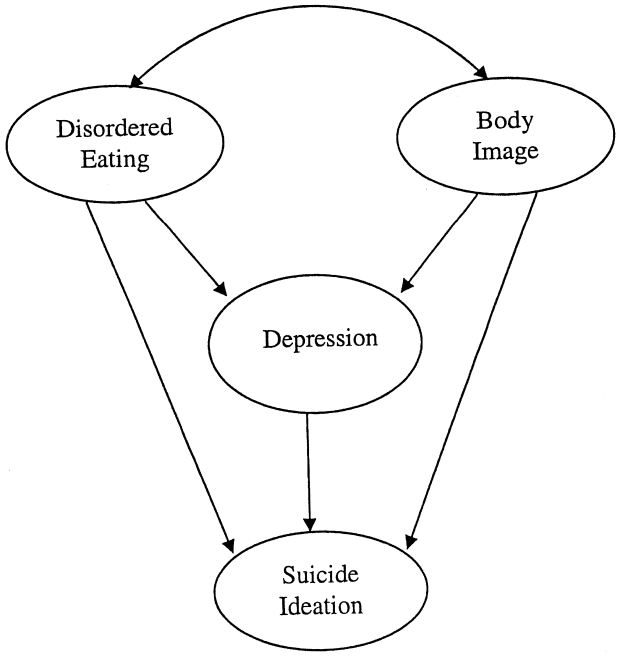


Figure 1. Conceptual model for the proposed relationships among possible risk factors.

mainder of the sample was divided among sophomores (15.8%), juniors (11%), and seniors (5.9%). The ethnicity breakdown was as follows: 35% Caucasian; 37.3% African American, 15.3% multiethnic, 9.2% Hispanic, and 2.3% Asian.

Students who gave assent completed a demographic questionnaire and several self-report measures during regular school hours in classroom settings. Of the students who were present on screening days, 83.4% participated. All measures were counterbalanced and completed within one class period. Upon completion, each student's packet was examined for predetermined indicators of suicide risk and depression. Students requiring individual follow-up were given an appropriate referral to the school psychologist.

Measures

The Eating Attitudes Test. The EAT-26 (Garner & Garfinkel, 1979) is a 26-item self-report measure that consists of three subscales: Dieting, Oral Control, and Bulimia and Food Preparation. All items are presented in a 6-point Likert format ranging from 1 (*never*) to 6 (*always*). The responses for each item are weighted from 0 to 3, with a score of 3 assigned to the response that is furthest in the "symptomatic" direction. A score of 2 is given to the immediately adjacent response; a score of 1 to the next adjacent response, and scores of 0 are assigned to the three responses furthest in the "asymptomatic" direction. A total score is derived by summing the weighted responses. There is empirical evidence that supports the EAT-26's concurrent and criterion validity (Gross, Rosen, Leitenberg, & Willmuth 1986; Rosen, Silberg, & Gross, 1988). Garner and Garfinkel reported an internal consistency coefficient of .94 for a group of normal controls. For the current study, the reliability estimates were: total score = .78, Dieting = .76, Bulimia = .47, and Oral Control = .50.

The Multidimensional Body-Self Relations Questionnaire—Appearance Subscales. The MBSRQ-AS (Cash, 2000) consists of 34 items that make up five subscales. The subscales are Appearance Evaluation, Appearance Orientation, Overweight Preoccupation, Self-Classified Weight, and the Body Areas Satisfaction Scale (BASS). Three of these subscales were used to assess different facets of body image in the current study. The BASS asks individuals to rate their satisfaction with specific areas of the body, such as weight, face, and lower torso. Items on the BASS are presented in a 5-point Likert format that range from 1 (*very dissatisfied*) to 5 (*very satisfied*). The Appearance Evaluation subscale asks individuals to rate how much they agree with statements pertaining to their attitudes and feelings about their appearance. Items on this subscale are presented in a 5-point Likert format that ranges from 1 (*definitely disagree*) to 5 (*definitely agree*). The last subscale used was the Weight Preoccupation subscale, which assesses an individual's fat anxiety and weight vigilance. Items for this scale are presented in the same way as the Appearance Evaluation scale. Internal consistencies for all subscales range from .73 to .89 for females and from .70 to .91 for males (Cash, 2000). For the current study, the alphas were as follows: BASS = .85, Appearance Evaluation = .80, and Weight Preoccupation = .79.

The Reynolds Adolescent Depression Scale—2nd Edition. The RADS-2 (Reynolds, 2002) is a 30-item self-report measure of depression intended for use with adolescents between the ages of 11 and 20. The RADS-2 can be broken down into four subscales that are summed to make up a total score. The Dysphoric Mood subscale assesses symptoms related to dysphoric mood such as sadness, crying, and loneliness. The Anhedonia/Negative Affect subscale evaluates disinterest in pleasurable activities, talking with others, eating meals, and negative affect. The Negative Self-Evaluation subscale assesses an adolescent's negative feelings about themselves. These items assess self-worth, self-denigration, thoughts about self-harm, beliefs about parents or others not caring, and thoughts about running away. The Somatic Complaints subscale assesses somatic and vegetative complaints such as feeling ill, fa-

tigue, and sleep disturbance. The total score from the RADS-2 provides a global picture of the severity of all depressive symptoms. The RADS-2 is presented in a 4-point Likert format. The RADS-2 also contains six critical items that, when endorsed at certain levels, have been found to discriminate between clinically depressed and nondepressed adolescents. Examples of critical items are "I feel like hurting myself," "I feel I am no good," and "I feel I am bad." When at least four of the six critical items are endorsed as "sometimes" or "most of the time," follow-up with the student is recommended (Reynolds, 2002). Students who met the criteria for critical items on the RADS-2 in this study were debriefed by a graduate student and appropriate referrals were made. To avoid any overlap between the measurement of depressive symptoms and suicidal ideation, the item "I feel like hurting myself" was removed from the analyses so as not to overlap with the Suicidal Ideation Questionnaire's measure of current suicide ideation. The RADS-2 has demonstrated good internal consistency reliability. Reliability estimates range from .80 to .93 for the subscale and total scores for samples of adolescents (Reynolds, 2002). For the current study, the reliability values were as follows: Total = .92, Dysphoric Mood = .85, Anhedonia = .72, Negative Self-Evaluation = .81, and Somatic Complaints = .81.

The Suicidal Ideation Questionnaire. The SIQ (Reynolds, 1988) is a 30-item self-report measure of adolescents' current level of suicidal ideation, designed for use with adolescents in grades 9 to 12. Items are rated according to a 7-point scale ranging from 6 (*almost every day*) to 0 (*I never had this thought*). Total scores range from 0 to 180 with higher scores indicating a greater level of suicidal ideation. The SIQ has demonstrated good internal consistency ($\alpha = .94$ to .97), and adequate concurrent and construct validity (Pinto, Whisman, & McCoy, 1997). In the current study, the reliability alpha for the total SIQ score was .96. For the three different parcels used in the structural equation modeling analyses, the reliabilities were as follows: SIQ Parcel 1 = .93, SIQ Parcel 2 = .89, and SIQ Parcel 3 = .88. A description of how the SIQ was divided into parcels can be found in the results section.

RESULTS

Structural equation modeling (Amos 8.0; Arbuckle, 2004) was used to analyze the relationships between disordered eating, body image, depression, and suicide ideation (see Figure 1). As recommended by Anderson and Gerbing (1988), the model was tested in a two-step approach, first confirming the measurement model and then testing the full structural model. The measurement model was evaluated through a confirmatory factor analysis of the measures used in the study. Subscale scores on each of the self-report measures were used as individual indicators and specified to load on their respective latent construct (e.g., depression, body image). For the latent variable of Suicide Ideation, subscales from the SIQ (Reynolds, 1988) were used. The SIQ does not have predetermined subscales. Therefore, for the purpose of these analyses, the 30 items from the SIQ were randomly split into three parcels and set as three indicators. The scale of each latent variable was set by fixing the path loading of the first indicator within each latent variable to 1.0, and the latent constructs were allowed to correlate.

When checking for normality of the data, several problems were found with the Disordering Eating indicators. The three indicators were found to have significant skew and their data were significantly kurtotic. The data from the EAT-26 suggested an overall low report of disordered eating symptoms among participants. Because of the high levels of skew and kurtosis, a log10 transformation was conducted on the EAT-26 subscales to correct for this. Following the transformation, the skew and kurtosis were much improved for all subscales and in acceptable ranges. The three parcels of the SIQ (Reynolds, 1988) also had a significant amount of skew and kurtosis. The same log10 transfor-

mation was used for the SIQ parcels to correct for the non-normality.

Measurement and Structural Models

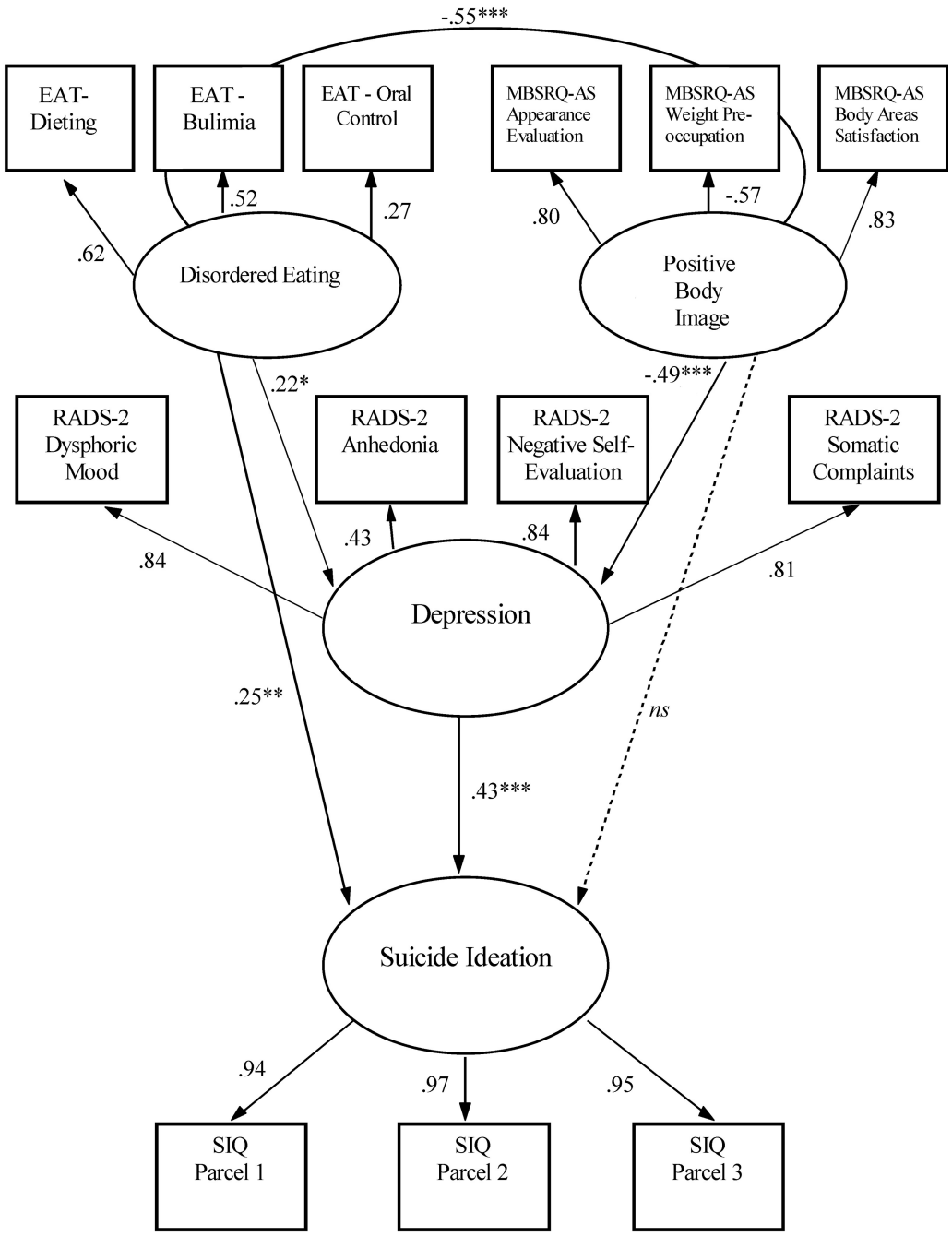
Multiple fit statistics were used to evaluate the overall fit of the measurement and full structural model: the chi-square statistic, Normed Fit Index (NFI), Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). Good model fit is indicated by a χ^2/df ratio less than 3, as well as values greater than .90 on the NFI and CFI. Additionally, a value less than .08 on the RMSEA suggests a good model fit (Hu & Bentler, 1995; Kline, 1998). Results from the confirmatory analysis indicated that the measurement model was found to be adequate. The RMSEA for the measurement model was .10, the NFI was .90, and the CFI was .91. The χ^2/df ratio of 5.21 was also higher than ideal. While these were not ideal numbers for a measurement model, it was deemed to be adequate for the purposes of this study in order to proceed with testing the structural model.

The fit indices remained the same as in the measurement model. The indices suggested that the data fit the hypothesized model adequately. It was hypothesized that disordered eating and body image would significantly contribute to current suicide ideation. The parameter estimates specifying the path between disordered eating and suicide ideation was statistically significant ($p < .01$), but the path between body image and suicide ideation was not significant. The path between depression and suicide ideation was significant ($p < .001$). The paths between disordered eating and depression and between body image and depression ($p < .001$) were also significant. As expected, there was a significant correlation between disordered eating and body image ($p < .001$). See Figure 2 for structural model estimates; see Table 1 for the correlation matrix for all study variables.

Cross-Group Modeling

It was hypothesized that data from female participants would better fit the proposed model than the data for males, which was tested through multigroup modeling. To test whether the same model was applicable across gender, it was necessary to test for measurement invariance between the unconstrained model for both groups combined and a model where a certain parameter is constrained to be equal between groups. In the first model, analyses were run separately by sex without any equality constraints. A baseline chi-square was generated by this model, $\chi^2 = 354.19$, $df = 118$, $p < .001$. The second model forced the loadings onto the latent factors to be the same for males and females. The chi-square for this model was $\chi^2 = 368.66$, $df = 132$, $p < .001$. A chi-square difference test was applied to determine if measurement invariance was present between the two models. The chi-square difference value of 14.47, $df = 14$, did not meet the critical value; therefore, the chi-square difference test was not significant. It was concluded that the constrained-equal model was the same as the unconstrained multigroup model. This result indicated that the model applied across gender and displayed measurement invariance, which did not support the hypothesis. To test for structural invariance the model was re-run but constrained so that the structural paths had to be equal. The chi-square values between the previous model and the structurally constrained model were compared. The chi-square difference between these two models was 3.60, $df = 5$, which did not meet the critical value. Therefore, the chi-square difference test was not significant between these two models, indicating that the structural model was invariant between the calibration and the validation samples. The model was therefore determined to be cross-validated.

An ANOVA was conducted on the data from males and females to determine if there were significant mean differences by gender on all variables. The results indicated that females reported significantly higher levels than males on depressive symptoms, body dissatisfaction, appearance dissatisfaction, overweight preoccupation, and disordered eating (see Table 2).



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

Figure 2. Structural model estimates for SEM analyses.

TABLE 1
Correlation Matrix, Means, and Standard Deviations of Variables in Model for Whole Sample

	RADS1	RADS2	RADS3	RADS4	EAT1	EAT2	EAT3	APP	BASS	OWP	SES	Parent	Class	SIQ1	SIQ2	SIQ3
RADS 1	1.00															
RADS2	.256**	1.00														
RADS3	.696**	.434**	1.00													
RADS4	.725**	.321**	.669**	1.00												
EAT1	.271**	.215**	.353**	.252**	1.00											
EAT2	.191**	.232**	.235**	.181**	.531**	1.00										
EAT3	.137**	.104*	.191**	.200**	.277**	.293**	1.00									
APP	−.394**	−.374**	−375**	−.328**	−.320**	−.128*	−.052	1.00								
BASS	−.416**	−.358**	−.421**	−.381**	−.306**	−.218**	−.111*	.689**	1.00							
OWP	.415**	.250**	.392**	.356**	.640**	.272**	.080	−.427**	−.409**	1.00						
SES	−.551**	−.497**	−.640**	−.498**	−.313**	−.223**	−.137**	.606**	.597**	−.355**	1.00					
Parent	−.355**	−.412**	−.522**	−.366**	−.176**	−.052	−.077	.171**	.338**	−.169**	.423**	1.00				
Class	−.336**	−.476**	−.444**	−.340**	−.181**	−.112*	−.039	.320**	.437**	−.145**	.468**	.502**	1.00			
SIQ1	.368**	.413**	.521**	.357**	.324**	.255**	.191**	−.314**	−.340**	.308**	−.483**	−.395**	−.352**	1.00		
SIQ2	.375**	.369**	.525**	.358**	.349**	.264**	.203**	−.274**	−.350**	.287**	−.434**	−.449**	−.372**	.938**	1.00	
SIQ3	.366**	.366**	.498**	.345**	.317**	.257**	.163**	−.290**	−.350**	.305**	−.464**	−.411**	−.371**	.933**	.927**	1.00
Means (Standard Deviations)																
	16.65	10.56	13.39	15.62	3.17	.49	2.11	3.75	3.77	1.94	22.59	52.27	49.28	3.62	4.73	4.23
	(5.02)	(3.13)	(4.88)	(4.63)	(4.38)	(1.21)	(2.57)	(.70)	(.72)	(.91)	(4.95)	(13.19)	(12.92)	(7.36)	(7.49)	(6.74)

Note. $^{*}p < .05$, $^{**}p < .01$. RADS1 = Dsythymia subscale, RADS2 = Anhedonia subscale, RADS3 = Negative Self-Evaluation subscale, RADS4 = Somatic Complaints subscale, EAT1 = Dieting subscale, EAT2 = Bulimia subscale, EAT3 = Oral Control subscale, APP = Appearance Evaluation subscale, BASS = Body Areas Satisfaction Scale, OWP = Overweight Preoccupation subscale, Parent = Measure of parent social support, Class = Measure of classmate social support, SIQ1 = first suicide ideation composite score, SIQ2 = second suicide ideation composite score, SIQ3 = third suicide ideation composite score.

TABLE 2
Means and Standard Deviations for Study Variables by Gender

Measure	Mean (*SD*)	*F* value	*p* value
RADS-2		27.06	.00
Males	50.43 (15.91)		
Females	58.80 (15.85)		
SIQ		3.68	.06
Males	9.91 (17.67)		
Females	14.11 (22.47)		
BASS		5.86	.02
Males	3.86 (0.67)		
Females	3.68 (0.76)		
APPEVAL		12.95	.00
Males	3.88 (0.66)		
Females	3.62 (0.72)		
OWP		56.04	.00
Males	1.62 (0.72)		
Females	2.27 (0.97)		
EAT-26		5.90	.02
Males	5.04 (4.89)		
Females	6.66 (7.69)		
CASSS—Peer		1.00	.32
Males	48.61 (13.22)		
Females	49.98 (12.61)		
CASSS—Parent		2.62	.11
Males	53.34 (12.86)		
Females	51.12 (13.47)		
SES		0.58	.45
Males	22.79 (4.83)		
Females	22.39 (5.08)		

Note. RADS-2 is Reynolds Adolescent Depression Scale—Second Edition, SIQ is Suicidal Ideation Questionnaire, BASS is Body Areas Satisfaction Scale, APPEVAL is Appearance Evaluation subscale from MBSRQ-AS, OWP is Overweight Preoccupation subscale from MBSRQ-AS, EAT-26 is Eating Attitudes Test, CASSS is Child & Adolescent Social Support Scale, and SES is Self-Esteem Scale.

DISCUSSION

It was hypothesized that disordered eating and body image would be related to suicide ideation as specified in the model. Disordered eating, but not body image, was found to have a significant direct effect on suicide ideation. The finding that disordered eating contributed significantly to current suicide ideation is very interesting, as this may be one of the few studies to have tested this direct path. Previous research had established that disordered eating is linked to suicide ideation and behavior (Miotto et al., 2003; Neumark-Sztainer et al., 1998); however, the present study may be the first to examine an explicit relationship between the two, and was able to successfully demonstrate that disordered eating habits and extreme weight control methods are significantly related to suicide ideation. Similar to the study by Miotto et al. (2003), the current study included both females and males and still found significant relationships between disordered eating and suicide ideation. Disordered eating habits may reflect a general unhappiness with the body which results in a continual striving to change the body through dieting, exercising, and other more extreme options (e.g., bingeing and purging, laxative use). Adolescents who are constantly working to control their weight may fail at times in their attempts. Failure can then lead to feelings of unhappiness, guilt, and hopelessness, and over an extended period of time, could contribute to depressive symptoms. As seen in the model, disordered eating also had a significant indirect effect on suicide ideation through depression.

Eating and body-related factors seem to be gaining more attention as risk factors for serious issues, such as depression and suicide ideation, as adolescents appear to be experiencing these issues at a fairly constant rate. Unhealthy eating and exercise habits seem to represent more than just behaviors, reflecting certain attitudes and feelings about the self. On the surface, dieting behaviors may seem fairly innocuous and it may be assumed that adolescents engaging in them are doing so in order to maintain weight or health; however, the results of the current study argue that these behaviors pose more than just a physical risk. Of course, unhealthy eating habits, excessive exercising, and dieting carry with them a very serious risk of physical harm. Furthermore, when disordered eating is found to contribute to depression and suicide ideation, the emotional and psychological toll of this behavior is exposed. Just as alcohol and substance abuse can be

a tangible sign of underlying depression or hopelessness, disordered eating may too serve as a warning sign to indicate a more troubled emotional state. It is also important to note that these connections were established in a community sample, indicating that the risk for suicide ideation may be even higher in samples of adolescents with psychiatric histories, particularly eating disorders. Based on the results of this study, it would be wise for parents and educators to keep these behaviors on their radar as possible indicators for depression and suicidal thinking. Furthermore, the promotion of healthy eating habits and exercise, coupled with education about realistic body images, may help prevent teenagers from developing dissatisfaction with their bodies and the unhealthy behaviors that may accompany those feelings.

Contrary to the hypothesis, body image/satisfaction did not directly increase risk for suicide ideation, but instead had an indirect effect through depressive symptoms. A handful of previous studies have found correlations between the two and/or demonstrated significant main effects regarding body image and suicide ideation. Orbach et al.'s (2001) study found that adolescents with prior suicide attempts reported more negative attitudes and feelings toward the body, less investment in protecting the body, and more body aberration than adolescents without a history of suicide attempts. While Orbach's study showed mean differences between nonsuicidal and suicidal adolescents for body image/attitudes, it did not examine direct effects of body image on suicide ideation. The results from the current study may point to the fact that poor body image alone does not contribute to the risk for suicide ideation. Disordered eating habits may be more indicative of pathology than poor body image alone. Moreover, when an individual is exhibiting disordered eating behaviors, it is likely that he or she is also experiencing unhappiness with the body and some dissatisfaction. It seems that disordered eating habits, which also may encompass poor body attitudes and feelings, are more detrimental to adolescents than just poor body image. If an adolescent evaluates their body in a factual way, they may then decide how to react to their evaluation. If they are accepting of their body, they may not develop depressive symptoms. If they react with shame or disgust, it may then lead to depressive symptoms and, subsequently, to thoughts about suicide. It is well-documented that poor body image is associated with depressive symptoms (e.g., Rierdan & Koff, 1997; Shepherd & Ricciardelli, 1998), and body image did have an indirect effect on suicide ideation through depression in the current study.

The results from the current study do not correspond completely with Orbach's theory about the link between body image and suicide risk. Orbach (1996) proposed that one's attitude toward and investment in the body are related to suicidal behavior, arguing that body dissatisfaction contributes to a greater propensity for self-harm because a person develops disregard for the body. Body dissatisfaction and/or disregard increase the likelihood that a person will view the body as an object separate from the self, making it easier to harm. This reduced regard for the body is what is hypothesized to increase the likelihood of engaging in self-destructive acts such as suicide, yet there are only a few studies testing this hypothesis. A recent study (Brausch & Muehlenkamp, 2007) attempted to test Orbach's theory in a sample of adolescents by determining if body attitudes and feelings, as measured by the Body Investment Scale (BIS; Orbach & Mikulincer, 1998), were predictive of suicide risk. Consistent with Orbach's theorizing that a dysfunctional view of the body increases self-destructive behaviors, the study found that negative body attitudes/feelings were predictive of suicidal ideation above and beyond the effects of depression, hopelessness, and past suicidal behavior. These findings replicated and expanded those by Orbach et al. (2001, 2006) and Miotto et al. (2001), providing support for the idea that body image is an important risk factor for suicidal ideation in adolescents. In addition, it was found that negative body attitudes/feelings uniquely predicted suicidal ideation for *both* males and females, indicating that body image warrants inclusion in future models of suicide risk for all adolescents.

Cross-Group Modeling

Given the inclusion of body image and disordered eating as risk factors for suicide in the proposed model, it was hypothesized that the data from female participants would better fit the model than the data from males. However, the results did not support this hypothesis. The cross-group modeling analyses indicated that the model applied equally well for males and females and that there were similar pathways between variables for both sexes. These findings are somewhat surprising given that body image and disordered eating are issues typically associated with females. As noted previously, most studies that examine the relationships between disordered eating, body image, depression, and/or suicide risk have focused on female samples. Considering the Miotto et al. study (2003) once again, their results indicated that both males and females who reported suicide ideation had significantly higher scores on all measures of eating disorder symptoms. The results of the current study are comparable as both found similar relationships between disordered eating and suicide ideation, regardless of gender. The current study's finding indicates that the proposed model of suicide risk for adolescents applies equally well across gender.

Unhappiness with the body and disordered eating behaviors are apparently prevalent in both sexes. Past studies have indicated that males also report unhappiness with the body and disordered eating behaviors (Kostanski & Gullone, 1998; Miotto et al., 2003). Additionally, more recent research has found this trend to continue, with 20% of boys ages 11 to 15 reporting body dissatisfaction compared to 37% of girls, and 7% of boys reporting being on a diet, compared to 15% of girls (Borresen & Rosenvinge, 2003). This trend of increasingly negative feelings toward the body and disordered eating behaviors in males strengthens the argument to include them in studies that examine these factors. Males have long gone under the radar for issues related to body image and eating factors. While the current study expected the proposed model to provide a better fit for females, the results surprisingly point to the fact that males are not immune to these issues either. It has long been thought that females were susceptible to current images in the media depicting thin ideals, which then fosters body dissatisfaction and efforts to be thinner. Males may be picking up on cues from external sources that there is also an ideal male body. According to Olivardia (2007), males are becoming increasingly "preoccupied and dissatisfied" with their bodies. He claims that this dissatisfaction manifests as disordered eating, muscle dysmorphia, and steroid use. He further argues that boys seem to be learning at a young age that society has set standards of masculinity to mean being muscular. All adolescents may be feeling pressures from various sources to look a certain way, and the efforts required to attain the ideal can be unhealthy, increasing adolescents' risk of depression and suicide along the way.

Limitations and Summary

While the current study offers some interesting results in the area of adolescent suicide risk, there are a number of limitations that need to be considered. First and foremost, the fit statistics for the measurement model were not at an ideal level for proceeding with a test of the structural model. For the purposes of the current study they were deemed to be "acceptable" in order for the hypotheses to be tested; however, it would be ideal to modify and adjust the measurement model in a future study so that it meets the acceptable levels of fit before testing the structural model. For example, since body image did not contribute to suicide ideation in the model, an alternate measure of body image could be used or the latent factor could be dropped from the model altogether.

A second limitation to consider is that the current study used a community sample of adolescents. As a result, the overall levels of clinically significant pathology and/or risk was low. For depression, only 7.56% of the participants scored above the clinical cutoff. For suicide ideation, 9.14% scored above the clinical cutoff, and only 4.64% of participants

scored above the cutoff for disordered eating symptoms. Therefore, the current results are likely only applicable to other community samples of adolescents. The fact that significance existed in the model suggest that these effects are robust. Future research should attempt to replicate these findings with other groups of adolescents, such as psychiatric inpatients and outpatient groups who are more likely to have a history of suicide attempts and/or high levels of current suicide ideation.

Future research may also consider whether or not disordered eating and poor body image functions the same for males and females. The current study's results indicate a similar statistical relationship between these factors and suicide ideation, but little is known about *how* these might increase the risk for suicide. An idea for a future study would be to see if data from a clinical sample of general inpatients and/or eating disorder patients provide a good fit for the proposed model. Although it would be very difficult to find enough male eating disorder patients to make gender comparisons, the data would be extremely valuable to the current body of literature. Such limited information is available for males in the area of body image and disordered eating, let alone with its relationship to suicide, that future research should definitely include males to learn as much as possible about their unique risk and protective factors.

The current study is unique in that it included body and eating related variables as risk factors for suicide ideation, which has been done previously in only a handful of studies. The model used in the current study helps to expand upon the "traditional" risk factors typically studied in adolescent risk models. It seems imperative to include variables that are associated with adolescence to determine just how problematic and risky they may be. Furthermore, the data fit the proposed model for males and females equally well, indicating that disordered eating behaviors also increase males' risk of suicide ideation. The results warrant inclusion of disordered eating behaviors in future studies of adolescent suicide risk, as well as including both males and females in studies that include eating and body-related factors. Overall, the current study extended previous models of suicide risk by including risk factors beyond depression to hopefully arrive at a more comprehensive model of adolescent suicide risk.

REFERENCES

ALLGOOD-MERTEN, B., LEWINSOHN, P. M., & HOPS, H. (1990). Sex differences in adolescent depression. *Journal of Abnormal Psychology*, *99*, 55–63.

ANDERSON, J. C., & GERBING, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*, 411–423.

ARBUCKLE, J. L. (2004). *AMOS 8.0 update to the AMOS User's Guide*. Chicago, IL: Smallwater's Coporation.

BORRESEN, R., & ROSENVINGE, J. H. (2003). Body dissatisfaction and dieting in 4,952 Norwegian children aged 11–15 years: Less evidence for gender and age differences. *Eating and Weight Disorders*, *8*, 238–241.

BRAUSCH, A. M., & MUEHLENKAMP, J. J. (2007). Body image and suicidal ideation in adolescents. *Body Image*, *4*, 207–212.

CASH, T. F. (2000). *The Multidimensional Body-Self Relations Questionnaire*. Unpublished test manual, Old Dominion University, Norfolk VA. (Ordered and received from the author via electronic mail.)

CORCOS, M., TAÏEB, O., BENOIT-LAMY, S., PATERNITI, S., JEAMMET, P., & FLAMENT, M. F. (2002). Suicide attempts in women with bulimia nervosa: Frequency and characteristics. *Acta Psychiatrica Scandinavica*, *106*, 381–386.

ESPOSITO, C. L., & CLUM, G. A. (2003). The relative contribution of diagnostic and psychosocial factors in the prediction of adolescent suicidal ideation. *Journal of Clinical Child and Adolescent Psychology*, *32*, 386–395.

GARNER D. M. (1997). The 1997 body image survey results. *Psychology Today*, *January–February*, 30–84.

GARNER, D. M., & GARFINKEL, P. E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, *9*, 273–279.

GROSS, J., ROSEN, J. C., LEITENBERG, H., & WILLMUTH, M. E. (1986). Validity of the Eating

Attitudes Test and the Eating Disorders Inventory in bulimia nervosa. *Journal of Consulting and Clinical Psychology*, *54*, 875–876.

Harris, E. C., & Barraclough, B. (1998). Excess mortality of mental disorder. *British Journal of Psychiatry*, *173*, 11–53.

Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76–99). Thousand Oaks, CA: Sage.

Kline, R. B. (1998). *Principles and practices of structural equation modeling.* New York: Guilford.

Kochanek, K. D., Murphy, S. L., Anderson, R. N., & Scott, C. (2004). Deaths: Final data for 2002. *National Vital Statistics Reports*, *53.* Hyattsville, MD: National Center for Health Statistics.

Kostanski, M., & Gullone, E. (1998). Adolescent body image dissatisfaction: Relationships with self-esteem, anxiety, and depression controlling for body mass. *Journal of Child Psychology and Psychiatry*, *39*, 255–262.

Mazza, J. J., & Reynolds, W. M. (1998). A longitudinal investigation of depression, hopelessness, social support, and major and minor life events and their relation to suicidal ideation in adolescents. *Suicide and Life-Threatening Behavior*, *28*, 358–374.

Miotto, P., de Coppi, M., Frezza, M., & Preti, A. (2003). Eating disorders and suicide risk factors in adolescents: An Italian community-based study. *The Journal of Nervous and Mental Disease*, *191*, 437–443.

Neumark-Sztainer, D., Story, M., Dixon, L. B., & Murray, D. M. (1998). Adolescents engaging in unhealthy weight control behaviors: Are they at risk for other health-compromising behaviors? *American Journal of Public Health*, *88*, 952–955.

Olivardia, R. (2007). Body image and muscularity. In J. E. Grant (Ed.), *Textbook of men's mental health* (pp. 307–324). Washington, DC: American Psychiatric Publishing.

Orbach, I. (1996). The role of the body experience in self-destruction. *Clinical Child Psychology and Psychiatry*, *1*, 607–619.

Orbach, I., Gilboa-Schechtman, E., Sheffer, A., Meged, S., Har-Even, D., & Stein, D. (2006). Negative bodily self in suicide attempters. *Suicide and Life-Threatening Behavior*, *36*, 136–153.

Orbach, I., & Mikulincer, M. (1998). The body investment scale: Construction and validation of a body experience scale. *Psychological Assessment*, *4*, 415–425.

Orbach, I., Stein, D., Shani-Sela, M., & Har-Even, D. (2001). Body attitudes and body experiences in suicidal adolescents. *Suicide and Life-Threatening Behavior*, *31*, 237–249.

Pinto, A., Whisman, M., & McCoy, K. (1997). Suicidal ideation in adolescents: Psychometric properties of the Suicidal Ideation Questionnaire in a clinical sample. *Psychological Assessment*, *9*, 63–66.

Reifman, A., & Windle, M. (1995). Adolescent suicidal behaviors as a function of depression, hopelessness, alcohol use, and social support: A longitudinal investigation. *American Journal of Community Psychology*, *23*, 329–354.

Reynolds, W. M. (1988). *Suicidal Ideation Questionnaire: Professional Manual.* Odessa, FL: Psychological Assessment Resources.

Reynolds, W. M. (2002). *Reynolds Adolescent Depression Scale—2nd Edition: Professional Manual.* Odessa, FL: Psychological Assessment Resources.

Rich, A. R., Kirkpatrick-Smith, J., Bonner, R. L., & Jans, F. (1992). Gender differences in the psychosocial correlates of suicidal ideation among adolescents. *Suicide and Life-Threatening Behavior*, *22*, 364–373.

Rierdan, J., & Koff, E. (1997). Weight, weight-related aspects of body image, and depression in early adolescent girls. *Adolescence*, *32*, 615–624.

Rierdan, J., Koff, E., & Stubbs, M. L. (1987). Depressive symptomatology and body image in adolescent girls. *Journal of Early Adolescence*, *7*, 205–216.

Rierdan, J., Koff, E., & Stubbs, M. L. (1988). Gender, depression, and body image in early adolescents. *Journal of Early Adolescence*, *8*, 109–117.

Rosen, J. C., Silberg, N. T., & Gross, J. (1988). Eating Attitudes Test and Eating Disorder Inventory: Norms for adolescent girls and boys. *Journal of Consulting and Clinical Psychology*, *56*, 305–308.

Shepherd, H., & Ricciardelli, L. A. (1998). Test of Stice's dual pathway model: Dietary restraint and negative affect as mediators of bulimic behavior. *Behaviour Research and Therapy*, *36*, 345–352.

Stice, E., Hayward, C., Cameron, R. P., Killen, J. D., & Taylor, C. B. (2000). Body-image and eating disturbances predict onset of depression among female adolescents: A longitudinal study. *Journal of Abnormal Psychology*, *109*, 438–444.

Thompson, J. K., Coovert, M. D., Richards, K. J., Johnson, S., & Cattarin, J. (1995). Development of body image, eating disturbance and general psychological functioning in female adolescents: Covariance structure modeling and longitudinal investigations. *International Journal of Eating Disorders*, *18*, 221–236.

Tiggemann, M. (1994). Gender differences in the interrelationships between weight dissatisfaction, restraint, and self-esteem. *Sex Roles*, *30*, 319–330.

Manuscript Received: November 17, 2007
Revision Accepted: July 18, 2008