



## Emotion regulation moderates relationships between body image concerns and psychological symptomatology

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### ABSTRACT

The study investigated the moderating role of emotion regulation (ER) in relationships between body image concerns and psychological symptomatology. A community sample of 533 boys and girls (11–20 years) completed measures assessing body image thoughts and feelings, domain-specific and general ER strategies, drive for thinness, and bulimic, depressive and anxiety symptoms. Results indicated that ER moderated relationships between body image concerns and both bulimic and depressive symptoms, but not relationships between body image concerns and drive for thinness or anxiety symptoms. Adolescents who reported frequent body image concerns were more likely to have higher levels of bulimic symptoms if they tended to use avoidance and internal dysfunctional ER strategies. Furthermore, adolescents who reported frequent body image concerns were more likely to have higher levels of depressive symptoms if they used positive rational acceptance and internal functional strategies infrequently. Implications of the findings for prevention and intervention are discussed.

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### Introduction

In today's body-conscious culture, adolescents frequently encounter situations and messages which may evoke body image concerns (Dittmar, Halliwell, Banerjee, Gardarsdottir, & Jankovic, 2007). Around 30–50% of girls in developed countries are dissatisfied with their weight and appearance (Thompson, 2001), and increasing numbers of boys are also dissatisfied with their appearance (O'Dea & Yager, 2006). There is growing evidence that such concerns contribute to pervasive body image disturbances and disordered eating (Cash, Phillips, Santos, & Hrabosky, 2004; Verplanken & Velsvik, 2008) and may be associated with other mental health problems such as depression and anxiety (Cash et al., 2004; Kostanski & Gullone, 1998). Body image concerns can cause significant distress for individuals and impact negatively on quality of life, interpersonal relationships and academic/vocational functioning (Cash & Fleming, 2002). Nevertheless, despite many adolescents experiencing body image concerns, only a portion exhibits mental health problems (Cash, 2002a). Therefore, it seems that for many adolescents, body image concerns may be benign or transient experiences which are of little clinical or long-term consequence. Such differences are likely due to individual varia-

tions in important risk and protective factors; that is, factors which increase or decrease the likelihood that body image concerns will lead to mental health problems. One factor known to be of importance for mental health but which has received little attention in relation to body image is emotion regulation.

Emotion regulation (ER) refers to the processes by which emotional experiences are evaluated, monitored, maintained, and modified (Thompson, 1994). To a large extent, it determines the emotions we experience, as well as when and how we experience and express them (Gross, 1998). ER difficulties have been implicated in the majority of psychological disorders (Gross & Levenson, 1997). As such, ER is moving to the forefront of investigations aimed at understanding the risk and protective factors associated with trajectories of mental health and illness, including depression, anxiety, and behavior problems amongst others (Amstadter, 2008; Durbin & Shafir, 2008).

Research suggests that poorly developed ER competencies and the use of strategies that prolong or magnify negative affect pose significant risk for the development and maintenance of mental illness. For example, greater use of emotion suppression, self-blame, rumination and catastrophizing, and less use of cognitive reappraisal and refocusing have been associated with higher levels of depression and anxiety and greater peer problems in adolescents (Betts, Gullone, & Allen, 2009; d'Acremont & Van der Linden, 2007; Hughes, Gullone, Dudley, & Tongue, 2010; Phillips & Power, 2007). There is also some existing research linking difficulties in emotional functioning to disordered eating. For example, anorexia nervosa,

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bulimia nervosa, and binge eating disorder have been variously related to elevated negative affect, alexithymia, suppressed emotion, and poor emotional awareness (Cochrane, Brewerton, Wilson, & Hodges, 1993; Geller, Cockell, Hewitt, Goldner, & Flett, 2000; Legenbauer, Vocks, & Rüdell, 2008; Markey & Vander Wal, 2007).

Studies investigating associations between ER and body image concerns, however, are scarce. In one related exception, strategies used to cope with body image threats were reported to be associated with psychosocial functioning (Cash, Santos, & Williams, 2005). Specifically, greater use of appearance fixing and avoidance strategies, and less use of positive acceptance strategies were associated with greater body dissatisfaction and eating disorder symptoms as well as lower self-esteem and social support.

Given the demonstrated links between ER and mental health and illness as reported in past research, it is proposed that ER may moderate relationships between body image concerns and adolescent mental health. Specifically, it is posited that adolescents who are able to effectively regulate their emotions are less likely to experience mental health problems related to body image concerns. In contrast, adolescents who have a more dysfunctional regulatory style are posited to be at increased risk of mental health problems. It is noteworthy that no studies could be found which have examined the potential moderating role of ER in the relationship between body image concerns and adolescent mental health. Furthermore, studies of body image concerns have typically focused on outcomes such as body image distortion and disordered eating to the neglect of other known correlates of body image concerns such as depression and anxiety (Cash et al., 2004; Kostanski & Gullone, 1998).

The current study therefore aimed to examine the moderating role of ER in relationships between body image concerns and eating disorder, depressive, and anxiety symptoms in a community sample of adolescents. Adolescence was the focus of the research given that this is a period characterized by heightened body image concerns (Levine & Smolak, 2002). It was hypothesized that: (i) body image concerns (i.e., negative emotions and cognitions about one's appearance) would be associated with eating disorder, depressive, and anxiety symptoms, and (ii) emotion regulation would moderate these relationships. Specifically, body image concerns were expected to be more strongly related to mental health problems for adolescents who more frequently utilized dysfunctional ER strategies and less frequently utilized functional ER strategies.

Thompson (1994) has argued that the context and the goals of the individual are important considerations in determining the functionality of ER. This suggests that the ER strategies a person utilizes in one situation may not be appropriate in another situation. Therefore, two types of ER strategies were examined in the current study based on domain specificity. Domain-specific ER strategies were those that adolescents used when faced with body image threats and challenges. They included appearance fixing, avoidance, and positive rational acceptance (Cash et al., 2005). General ER strategies were those that adolescents used to manage emotions generally and were not necessarily specific to body image concerns (Phillips & Power, 2007). It was expected that domain-specific strategies would be more salient in moderating relationships between body image concerns and symptomatology as indicated by larger moderation effects and/or a larger proportion of significant effects.

## Method

### Participants and Procedure

The study took place in Melbourne, Australia, and was approved by the institutional ethics committee. Participants were drawn

from a longitudinal study of emotional development for which two cohorts of 9- to 15-year-olds had been recruited from metropolitan primary and secondary schools, one cohort at Wave 1 and another at Wave 4 (Gullone, Hughes, King, & Tonge, 2010). At Wave 6, all participants who, at the time of consenting to the longitudinal study, agreed to be contacted about extensions to the main study were sent a questionnaire to be completed at home and returned by post ( $n = 619/764$ ; 81%). A total of 534 questionnaires were returned (86%). One case was excluded due to missing data. The final sample for analysis therefore comprised 533 adolescents ( $M$  age = 15.6 years,  $SD = 2.5$ ; range 11–20) of which 208 (39%) were male and 453 (85%) were born in Australia. To reduce outliers, body mass index (BMI) was standardized within the sample, and scores greater than 3.29 were recoded to the next most extreme value ( $n = 7$ ). Following this, mean BMI for the sample was 21.3 kg/m<sup>2</sup> ( $SD = 4.2$ ). Seventy-five percent had a normal BMI (5th–85th percentile), 6% were underweight (<5th percentile), and 19% were overweight or obese (>85th percentile). Forty-one participants did not state either or both their height and weight.

### Measures

**Body image concerns.** Body image concerns were assessed using the Situational Inventory of Body Image Dysphoria (SIBID; Cash, 2002b) and Body Image Thoughts Inventory (BITI; Hughes & Gullone, 2010). The SIBID assesses the frequency of negative feelings about one's body and appearance in 48 situations on a 5-point scale (0 = *never*, 5 = *(almost) always*). For example, "When looking at myself in the mirror" and "When I am with people who are talking about weight or dieting". The SIBID has been reported to have high internal consistency ( $\alpha = .96$ ) and 4-week test-retest reliability ( $\alpha = .80-.86$ ), and to correlate well with other measures of body image evaluation (Cash, 2002b). In the current study, the internal consistency coefficient (Cronbach's alpha) of the SIBID was .98. The BITI is a 26-item measure assessing the frequency of positive and negative thoughts about one's body and appearance (e.g., "I don't look good enough") on a 5-point scale (1 = *never*, 5 = *very often*). Only the Negative Thoughts scale was used in the current study. This scale has been found to have high internal consistency ( $\alpha = .97$ ), good 4-week test-retest reliability ( $r = .87$ ) and sound construct validity (Hughes & Gullone, 2010). In the current study, the internal consistency coefficient was .97. A single Body Image Concerns composite score was calculated by averaging the absolute standardized scores of the SIBID and BITI.

**Emotion regulation.** Domain-specific ER strategies were assessed using the 29-item self-reported Body Image Coping Strategies Inventory (BICSI; Cash et al., 2005). The BICSI assesses respondents' use of three strategies for coping with body image threats and challenges: Appearance Fixing (10 items; e.g., "I do something to try to look more attractive"), Avoidance (8 items; e.g., "I try to ignore the situation and my feelings"), and Positive Rational Acceptance (11 items; e.g., "I tell myself that there are more important things than what I look like"). Items are rated on a 5-point scale (0 = *definitely not like me*, 4 = *definitely like me*). The BICSI has been reported to have good internal consistency ( $\alpha = .74-.90$ ) and 2-week test-retest reliability ( $r = .66-.86$ ) as well as sound factor structure and construct validity (Cash & Grasso, 2005; Cash et al., 2005). In the current study, the internal consistency coefficients ranged from .79 (Positive Rational Acceptance) to .90 (Appearance Fixing).

General ER strategies were assessed using the Regulation of Emotion Scale (REQ; Phillips & Power, 2007). The REQ assesses respondents' use of Internal/External Functional/Dysfunctional strategies. Internal Dysfunctional strategies include punishment, rumination, negative social comparison, suppression, and de-

realization (e.g., “I dwell on my thoughts and feelings”). Internal Functional strategies include positive reappraisal, modification of goals, planning, putting into perspective and concentration on pleasant activities (e.g., “I review (re-think) my thoughts and beliefs”). External Dysfunctional strategies include bullying, verbal assault, physical assault, making others feel bad and lashing out at objects (e.g., “I take my feelings out on other people verbally . . .”). External Functional strategies include expression of feelings, advice seeking, physical contact, exercise, communication and pleasant activities (e.g., “I talk to someone about how I feel”). Items are rated on a 5-point scale (1 = *not at all*, 5 = *always*). The REQ has been reported to have good internal consistency ( $\alpha = .66-.76$ ) as well as sound factor structure and construct validity (Phillips & Power, 2007). In the current study, the internal consistency coefficients ranged from .74 (Internal Functional) to .82 (External Dysfunctional).

**Eating disorder symptoms.** Eating disorder symptoms were assessed using the Drive for Thinness and Bulimia scales of the Eating Disorder Inventory-3 (Garner, 2005). The Drive for Thinness scale (7 items) assesses desire to be thinner, dieting, weight preoccupation and fear of weight gain. The Bulimia scale (8 items) assesses thoughts and behaviors related to uncontrollable overeating (i.e., binge eating). All items are rated on a six-point scale (1 = *never*, 6 = *always*). These scales have been reported to have sound validity, good internal consistency (Drive for Thinness  $\alpha = .87-.93$ ; Bulimia  $\alpha = .63-.93$ ) and 1-week test-retest reliability (Drive for Thinness  $r = .95$ ; Bulimia  $r = .94$ ). In the current study, the internal consistency coefficients were .89 for Drive for Thinness and .86 for Bulimia.

**Depressive symptoms.** Depressive symptoms were assessed using the Children’s Depression Inventory (CDI; Kovacs, 1992). The CDI is a 27-item self-report measure of depressive symptomatology for use with children aged 7–17 years. As such, only participants under 18 completed the CDI ( $n = 417$ ). Each item comprises three statements reflecting varying severity of a given symptom (e.g., “I am sad once in a while”, “I am sad many times”, “I am sad all the time”). Items are scored from 0 to 2 and a total score is calculated by summing all items. Higher scores indicate higher levels of depressive symptomatology. In the current study, the suicide ideation item was omitted from the CDI as required by the institutional ethics committee and participating schools. The 26-item total score was adjusted to conform to the 27-item total score [26-item total + (26-item total/26)] (Twenge & Nolen-Hoeksema, 2002). The CDI is reported to have high internal consistency ( $\alpha = .71-.89$ ) and 2-week test-retest reliability ( $r = .82$ ; Kovacs, 1992). Extensive research has demonstrated the validity of the CDI, including convergence with other self-report measures of depression and psychological well-being, and discrimination between groups of depressed and non-depressed children (see Sitarenios & Stein, 2004 for a comprehensive list of studies). In the current study, the internal consistency coefficient of the CDI was .91.

**Anxiety symptoms.** Anxiety symptoms were assessed using the Revised Children’s Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985). The RCMAS is a self-report measure of anxiety symptomatology for use with children and adolescents. Only participants under 18 completed the RCMAS ( $n = 418$ ). Each item comprises a symptom (e.g., “I worry a lot of the time”, “Often I feel sick in my stomach”). Items are scored 0 = *no*, 1 = *yes* and a total score is calculated by summing all items. The RCMAS has high internal consistency ( $\alpha = .80-.83$ ), high 3-week test-retest reliability ( $r = .98$ ) and convergent validity with measures of child trait anxiety. In the current study, the internal consistency coefficient of the RCMAS was .91.

## Statistical Analytic Plan

Following data screening and preliminary analyses, a series of regressions were conducted predicting symptomatology (eating disorder, depressive, anxiety) from body image concerns and ER strategies. Moderation was examined by including interaction terms between body image concerns and ER in the regression analyses.<sup>1</sup> All predictor variables were centered prior to calculation of interaction terms. Sex, age, and BMI were entered as covariates.

## Results

### Preliminary Analyses

Means and standard deviations of the variables for the total sample and for girls and boys are presented in Table 1. Two-tailed *t*-tests indicated that girls reported significantly higher scores on all assessed variables except Positive Rational Acceptance, Internal Functional ER, and External Functional ER which did not differ significantly between girls and boys.

Correlations between variables for boys and girls are presented in Table 2. With some exceptions, there were significant correlations between the predictors and outcome variables ranging from small to large in magnitude. Notable exceptions were Positive Rational Acceptance and Internal Functional ER strategies which were mostly weakly or not significantly correlated with symptomatology. In general, correlations between predictor and outcome variables were somewhat weaker for boys than for girls.

There were significant weak positive correlations between age and the outcome variables for girls (range  $r = .17-.23$ ,  $p < .05$ ) but not boys. There were significant weak positive correlations between BMI and the outcome variables for girls (range  $r = .15-.33$ ,  $p < .05$ ; excluding Depressive Symptoms  $r = .09$ , *ns*) and for boys (range  $r = .21-.38$ ,  $p < .01$ ; excluding Anxiety Symptoms  $r = .10$ , *ns*).

### Domain-Specific ER as a Moderator of Relationships Between Body Image Concerns and Symptomatology

A hierarchical multiple regression analysis was conducted for each of the four symptom types (Drive for Thinness, Bulimic, Depressive, and Anxiety). Age, sex, and BMI were entered as covariates at Step 1. Body Image Concerns, Appearance Fixing, Avoidance, and Positive Rational Acceptance were entered at Step 2. The interaction terms between Body Image Concerns and each of the three ER strategies were entered at Step 3. Due the number of analyses performed, alpha was reduced to .01 to reduce the chance of Type I error.

The models were significant and accounted for between 49% and 57% of the variance in symptomatology (see Table 3). Being female predicted higher levels of all four types of symptoms, higher BMI significantly predicted greater Drive for Thinness and Bulimic Symptoms, and older age significantly predicted Depressive Symptoms. More frequent Body Image Concerns significantly predicted higher levels of all four types of symptoms. Appearance Fixing significantly predicted greater Drive for Thinness, Avoidance significantly predicted higher levels of all four types of symptoms, and Positive Rational Acceptance significantly predicted lower levels of Bulimic and Depressive Symptoms.

The relationship between Body Image Concerns and Bulimic Symptoms was significantly moderated by Avoidance, and the relationship between Body Image Concerns and Depressive Symptoms was significantly moderated by Positive Rational Acceptance. The

<sup>1</sup> Moderation by sex was also examined. No tests were significant so are not presented herein. Details are available from the authors upon request.

**Table 1**  
Means and standard deviations for girls and boys.

	Total	Girls	Boys	<i>t</i>	<i>p</i>
Body image concerns	1.54 (0.96)	1.79 (0.98)	1.17 (0.80)	7.57	<.001
Appearance Fixing	1.29 (0.65)	1.44 (0.64)	1.05 (0.59)	7.04	<.001
Avoidance	0.86 (0.50)	0.90 (0.49)	0.80 (0.49)	2.38	.018
Positive Rational Acceptance	1.59 (0.43)	1.62 (0.43)	1.55 (0.43)	1.68	.093
Internal Dysfunctional ER	2.13 (0.71)	2.20 (0.72)	2.02 (0.69)	2.96	.003
Internal Functional ER	3.10 (0.66)	3.12 (0.63)	3.07 (0.70)	0.87	.387
External Dysfunctional ER	1.61 (0.58)	1.57 (0.56)	1.66 (0.59)	−1.78	.075
External Functional ER	3.10 (0.77)	3.19 (0.76)	2.96 (0.76)	3.40	.001
Drive for Thinness	17.6 (8.2)	19.5 (8.4)	14.7 (6.9)	6.86	<.001
Bulimic symptoms	16.1 (7.0)	16.9 (7.2)	14.7 (6.5)	3.58	<.001
Depressive symptoms	7.50 (7.40)	8.46 (8.15)	6.18 (5.99)	3.13	.002
Anxiety symptoms	9.22 (6.82)	10.4 (7.24)	7.6 (5.86)	4.11	<.001

**Table 2**  
Correlations between study variables for boys and girls.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Body image concerns		.69***	.54***	.03	.57***	.01	.25***	−.21**	.57***	.57***	.60***	.61***	.17**	.33***
2. Appearance Fixing	.76***		.52***	.23**	.38***	.04	.14*	−.02	.50***	.37***	.40***	.46***	.14*	.15*
3. Avoidance	.55***	.43***		.18**	.43***	−.17*	.31***	−.31***	.30***	.54***	.46***	.53***	.05	.14
4. Positive Rational Acceptance	−.24***	−.17**	−.05		.01	.29***	−.04	.11	−.02	−.07	−.14	.03	.05	−.12
5. Internal Dysfunctional ER	.62***	.48***	.56***	−.15**		.06	.44***	−.19**	.24**	.37***	.54***	.58***	.19**	.16*
6. Internal Functional ER	−.18*	−.13*	−.21***	.45***	−.11*		−.15*	.50***	.10	−.10*	−.19*	.01	.02	−.03
7. External Dysfunctional ER	.35***	.35***	.48***	−.14**	.51***	−.11***		−.13*	.04	.30***	.26***	.32***	.14	.16*
8. External Functional ER	−.31***	−.12*	−.36***	.26***	−.38***	.46***	−.14*		.04	−.09	−.33***	−.21***	−.18*	−.09
9. Drive for Thinness	.68***	.59***	.52***	−.16**	.48***	−.07	.29***	−.19***		.52***	.38***	.27***	−.09	.37***
10. Bulimic symptoms	.64***	.54***	.62***	−.19**	.58***	−.07	.43***	−.17**	.64***		.44***	.42***	.01	.38***
11. Depressive symptoms	.62***	.47***	.58***	−.22***	.66***	−.25***	.45***	−.34***	.40***	.54***		.70***	.07	.21**
12. Anxiety symptoms	.67***	.54***	.52***	−.13*	.70***	−.22**	.44***	−.26***	.52***	.54***	.75***		.02	.10
13. Age	.35***	.28***	.12*	−.10	.10	.03	.08	−.13*	.20***	.17**	.22**	.23**		.45***
14. BMI	.31***	.18**	.19***	−.04	.09	−.05	.06	−.09	.33***	.27***	.09	.17**	.31***	

Note: Boys above diagonal, girls below diagonal.

\* *p* < .05.  
\*\* *p* < .01.  
\*\*\* *p* < .001.

**Table 3**  
Hierarchical multiple regression analysis predicting symptomatology from body image concerns and domain-specific ER.

		Drive for Thinness		Bulimic symptoms		Depressive symptoms		Anxiety symptoms	
		$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>
Step 1	Age	.02	.601	.06	.205	.14	.007	.12	.020
	Sex (0 = girl; 1 = boy)	−.28	<.001	−.17	<.001	−.17	.001	−.22	<.001
	BMI	.31	<.001	.27	<.001	.08	.135	.10	.056
	$\Delta R^2$	.19		.13		.06		.08	
	<i>F</i>	38.29	<.001	23.07	<.001	8.54	<.001	11.31	<.001
Step 2	Body Image Concerns (BIC)	.44	<.001	.37	<.001	.50	<.001	.54	<.001
	Appearance Fixing	.19	<.001	.07	.197	−.05	.403	.03	.679
	Avoidance	.11	.003	.35	<.001	.33	<.001	.23	<.001
	Positive Rational Acceptance	−.03	.402	−.11	.001	−.18	<.001	−.05	.217
	$\Delta R^2$	.36		.40		.43		.41	
<i>F</i>	94.07	<.001	100.73	<.001	77.96	<.001	74.76	<.001	
Step 3	BIC × Appearance Fixing	.05	.183	.04	.313	.04	.368	.03	.581
	BIC × Avoidance	.06	.088	.20	<.001	.09	.042	−.03	.497
	BIC × Positive Rational Acceptance	.03	.330	−.02	.487	−.13	.002	.03	.419
	$\Delta R^2$	.01		.05		.03		.00	
	<i>F</i>	3.05	.030	16.50	<.001	7.54	<.001	0.35	.791
Total $R^2$	.56		.57		.52		.49		
<i>F</i>	59.64	<.001	63.08	<.001	39.97	<.001	35.87	<.001	

relationships between Body Image Concerns and Drive for Thinness and between Body Image Concerns and Anxiety Symptoms were not significantly moderated by domain-specific ER strategies.

To examine the significant moderation effects, tests of simple slopes were performed for each relationship when the moderator was 1 SD below and 1 SD above the mean. The relationship between

Body Image Concerns and Bulimic Symptoms was stronger when Avoidance was high ( $\beta = .60, p < .001$ ) than when Avoidance was low ( $\beta = .20, p < .001$ ). Similarly, the relationship between Body Image Concerns and Depressive symptoms was stronger when Positive Rational Acceptance was low ( $\beta = .69, p < .001$ ) than when Positive Rational Acceptance was high ( $\beta = .43, p < .001$ ). These

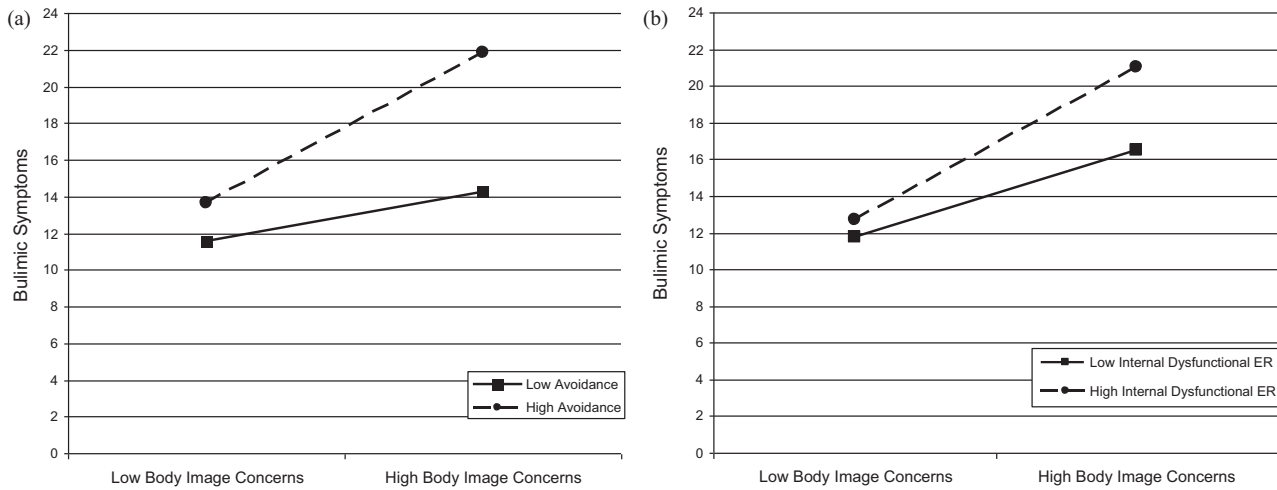


Fig. 1. The relationship between body image concerns and bulimic symptoms moderated by (a) avoidance and (b) internal dysfunctional ER.

moderation effects are depicted in Figs. 1(a) and 2(a), for low and high levels of Body Image Concerns (1 SD below and above the mean).

**General ER as a Moderator of the Relationship Between Body Image Concerns and Symptomatology**

A hierarchical multiple regression analysis was conducted for each of the four symptom types (Drive for Thinness, Bulimic, Depression, Anxiety). Age, sex, and BMI were entered as covariates at Step 1. Body Image Concerns, Internal Dysfunctional ER, Internal Functional ER, External Dysfunctional ER and External Functional ER were entered at Step 2. The interaction terms between Body Image Concerns and each of the four ER strategies were entered at Step 3. Due the number analyses performed, alpha was reduced to .01 to reduce the chance of Type I error.

The models were significant and accounted for between 52% and 58% of the variance symptomatology (see Table 4). Greater Internal Dysfunctional ER significantly predicted greater Bulimic, Depressive, and Anxiety Symptoms. Lower Internal Functional ER significantly predicted higher levels of Depressive Symptoms. Greater External Dysfunctional ER significantly predicted higher levels of Bulimic and Depressive Symptoms. External Functional ER did not significantly predict any symptom type.

The relationship between Body Image Concerns and Bulimic Symptoms was significantly moderated by Internal Dysfunctional ER, and the relationship between Body Image Concerns and Depressive Symptoms was significantly moderated by Internal Functional ER. The relationships between Body Image Concerns and Drive for Thinness and between Body Image Concerns and Anxiety Symptoms were not significantly moderated by general ER.

To examine the significant moderation effects, tests of simple slopes were performed for each relationship when the moderator was 1 SD below and 1 SD above the mean. The relationship between Body Image Concerns and Bulimic Symptoms was stronger when Internal Dysfunctional ER was high ( $\beta = .60, p < .001$ ) than when Internal Dysfunctional ER was low ( $\beta = .34, p < .001$ ). Conversely, the relationship between Body Image Concerns and Depressive Symptoms was stronger when Internal Functional ER was low ( $\beta = .72, p < .001$ ) than when Internal Functional ER was high ( $\beta = .48, p < .001$ ). These moderating effects are depicted in Figs. 1(b) and 2(b) for low and high levels of Body Image Concerns (1 SD below and above the mean).

**Discussion**

As expected body image concerns were significantly positively related to eating disorder, depressive and anxiety symptoms in adolescents. The ways by which adolescents regulate their emo-

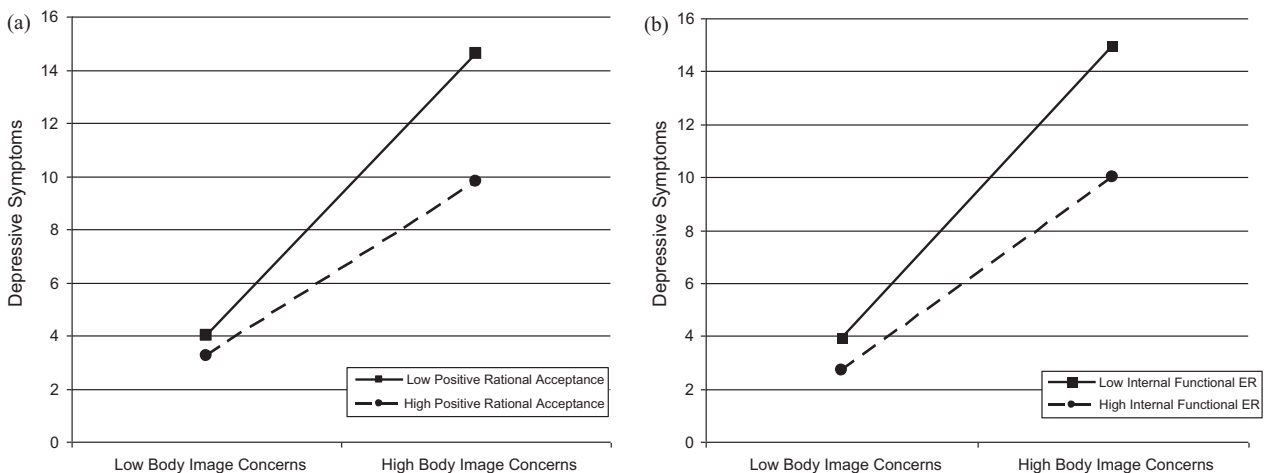


Fig. 2. The relationship between body image concerns and depressive symptoms moderated by (a) positive rational acceptance and (b) internal functional ER.

**Table 4**  
Hierarchical multiple regression analysis predicting symptomatology from body image concerns and general ER.

		Drive for Thinness		Bulimic symptoms		Depressive symptoms		Anxiety symptoms	
		$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>	$\beta$	<i>p</i>
Step 1	Age	.03	.570	.06	.194	.15	.006	.13	.011
	Sex (0 = girl; 1 = boy)	-.28	<.001	-.17	<.001	-.17	.001	-.21	<.001
	BMI	.31	<.001	.28	<.001	.08	.134	.10	.065
	$\Delta R^2$	.19		.13		.06		.08	
	<i>F</i>	37.64	<.001	22.95	<.001	8.41	<.001	10.92	<.001
Step 2	Body Image Concerns (BIC)	.62	<.001	.48	<.001	.38	<.001	.41	<.001
	Internal Dysfunctional	.08	.088	.17	.001	.33	<.001	.40	<.001
	Internal Functional	.04	.248	-.03	.384	-.18	<.001	-.10	.015
	External Dysfunctional	.01	.837	.17	<.001	.11	.009	.07	.063
	External Functional	.02	.634	.06	.139	-.07	.116	.02	.642
	$\Delta R^2$	.34		.37		.48		.49	
<i>F</i>	67.99	<.001	68.51	<.001	77.64	<.001	84.92	<.001	
Step 3	BIC $\times$ Internal Dysfunctional	.07	.095	.13	.001	.08	.051	-.02	.604
	BIC $\times$ Internal Functional	.08	.029	-.04	.313	-.13	.001	-.04	.348
	BIC $\times$ External Dysfunctional	.00	.993	.03	.412	.03	.464	-.06	.143
	BIC $\times$ External Functional	-.05	.143	-.05	.176	-.08	.034	.01	.737
	$\Delta R^2$	.01		.03		.04		.01	
<i>F</i>	2.41	.048	7.45	<.001	9.25	<.001	1.19	.315	
Total $R^2$	.54		.52		.58		.58		
<i>F</i>	45.62	<.001	42.89	<.001	42.92	<.001	41.63	<.001	

tions were also significantly related to symptomatology. Moreover, as hypothesized, relationships between body image concerns and bulimic and depressive symptoms were moderated by ER strategy use. Counter to hypotheses, however, ER strategy use did not moderate the relationship between body image concerns and drive for thinness nor the relationship between body image concerns anxiety symptoms. The study is significant in being the first known study to examine the potential moderating effects of ER in the development of body-image related psychopathology.

The results indicated that bulimic symptoms were significantly associated with more frequent body image concerns, greater use of avoidance and less use of positive rational acceptance. Further, adolescents who experience frequent negative thoughts and feelings about their appearance were more likely to have bulimic symptomatology if they tended use avoidance to regulate negative emotion related to body image. By comparison, adolescents who experience frequent negative thoughts and feelings about their appearance and tended not to use avoidance were less likely to have bulimic symptomatology. These findings are consistent with past research on emotion difficulties in bulimia nervosa (Legenbauer et al., 2008) and are consistent with theoretical models suggesting that binge eating functions as a form of emotional avoidance (Blackburn, Johnston, Blampied, Popp, & Kallen, 2006; Heatherton & Baumeister, 1991).

Body image concerns were also more strongly related to bulimic symptoms for adolescents who reported greater use of internal dysfunctional ER strategies such as rumination and suppression. This suggests that general ER strategies, that is strategies that are not necessarily specific to body image, may also play an important moderating role in relationships between body image concerns and bulimic symptoms. This finding may be, in part, due to overlap between avoidance and general internal dysfunctional ER. Indeed, there were significant positive correlations between these two variables, and a number of the avoidance items of the BICSI reflect cognitive avoidance and emotional suppression (i.e., internal dysfunctional strategies). Thus, it may not be necessary to assess domain-specific ER when investigating these relationships, but rather to identify a general ER style characterized by heightened use of internal dysfunctional strategies.

Depressive symptoms were significantly associated with more frequent body image concerns, greater use of avoidance, internal dysfunctional strategies, and external dysfunctional strategies, and less use of positive rational acceptance and internal functional strategies. In addition, it was found that the relationship between body image concerns and depressive symptoms was moderated by use of positive rational acceptance and internal functional strategies. These results indicate that adolescents who experience frequent negative thoughts and feelings about their appearance are less likely to have depressive symptomatology if they tend use acceptance strategies to regulate negative emotions related to body image, or if they tend to use internal functional ER strategies such as reappraisal generally. By comparison, adolescents who experience frequent negative thoughts and feelings about their appearance and tend not to use acceptance or internal functional strategies appear to be more likely to have depressive symptomatology. These findings are consistent with past research reporting associations between dysfunctional ER and elevated depressive symptoms (Betts et al., 2009; d'Acremont & Van der Linden, 2007), although this is the first study to examine these relationships in regard to body image. Once again, the findings suggest some overlap between domain-specific and general ER strategies. That is, there were significant positive correlations between positive rational acceptance and internal functional strategies, and the acceptance items of the BICSI tend to reflect cognitive efforts to re-think or reframe body image challenges in a positive way (i.e., internal functional strategies). Of relevance, past research indicates that depressive symptoms are associated with cognitive bias toward negative emotional information (Fritzsche et al., 2010) and cognitive inflexibility with regard to negative emotional stimuli (Deveney & Deldin, 2006). Thus, depressive symptoms appear to be closely tied to cognitive emotional processes.

Drive for thinness was significantly associated with more frequent body image concerns, and greater use of appearance fixing and avoidance. Similarly, anxiety symptoms were significantly associated with more frequent body image concerns and greater use of appearance avoidance, as well as greater use of internal dysfunctional strategies. Of interest, relationships between body image concerns and drive for thinness and anxiety symptoms were

not moderated by ER. Thus, although the findings suggests that although ER is not an important risk or protective factor with regard to relationships body image concerns and drive for thinness or anxiety symptoms, there was some evidence of significant direct relationships between ER and these symptoms. The associations between these factors and the mechanisms through which they operate therefore remain important avenues for future investigation. Assessment of other types of ER strategies as well as other factors such as personality and peer relationships which may moderate relationships would also be of interest.

The findings should also be considered with regard to the anxiety measure utilized. The RCMAS assesses mostly general anxiety symptoms (e.g., worry, fear, somatic complaints) outside of a diagnostic framework. Thus, it might not have been sufficiently sensitive to specific forms of anxiety (e.g., social phobia, obsessive compulsive symptoms) which may be relevant to body image concerns and ER. Research into specific forms of anxiety will be an important next step in this field.

Given the purported significance of context for functionality of ER (Thompson, 1994), it was expected that domain-specific ER strategies would be more salient moderators of relationships between body image concerns and symptomatology; however, this did not appear to be the case. Two of three domain-specific strategies (avoidance and positive rational acceptance) and two of four general ER strategies (internal dysfunctional and internal functional) were observed to significantly moderate the relationships of interest. Furthermore, the magnitude of moderation effects (i.e., the change in  $\beta$  coefficient when the moderator was low compared to when it was high) was only slightly larger for avoidance ( $\Delta\beta$  coefficient = .40) compared to internal dysfunctional ER ( $\Delta\beta$  coefficient = .26) in regard to bulimic symptoms, and even less so for positive rational acceptance ( $\Delta\beta$  coefficient = -.26) compared to internal functional ER ( $\Delta\beta$  coefficient = -.24) for depressive symptoms. These observations add further support to the proposition that it may not be necessary to assess domain-specific ER when investigating these relationships. Further research is, however, necessary to confirm this as there may be other domains for which context an important consideration.

There are some limitations to the current study which must be noted. First and foremost, the cross-sectional design curtails conclusions regarding causality. For example, it is feasible that ER difficulties are a consequence of symptomatology rather than a determinant. Longitudinal research will be vital in furthering the understanding the observed relationships and their sequential linkages. Second, the constructs of interest were assessed only via self-report methodology. Although adolescents are arguably the best sources of information regarding their own emotional functioning, shared-method variance may in part account for the observed associations between constructs. Third, the sample had completed some of the measures previously as part of the longitudinal study from which the sample was drawn (i.e., CDI, RCMAS). The results of these measures may therefore have been impacted by retest effects. Although, there is currently no way to control for such effects, the one-year retest interval would likely mean such effects were minimal. Replication will help to confirm that this is the case. Finally, the participants were selected from a community sample and only symptomatology, not diagnostic status, was assessed. Therefore, generalization of the current findings to clinical populations must be made with requisite caution.

Despite these limitations, the study is significant in being the first known study to examine the moderating role of ER in the relationships between body image concerns and symptomatology in adolescents. The examination of both domain-specific and general ER strategies provided a comprehensive test of the hypotheses, particularly given past research has tended to assess only general strategies despite the purported importance of context for

functionality of ER (Thompson, 1994). The large sample size and inclusion of both males and females were additional noteworthy strengths.

The investigation of risk and protective factors related to body image concerns is an important avenue of research given associations with pervasive disturbances and clinical manifestation. Although some notable attempts have recently been made to address sociocultural factors which may contribute to body image concerns (e.g., Australian Government, 2010; BBC News, 2006), the impact of such strategies is likely to be limited and, moreover, it is improbable that all sources of body image concerns (sociocultural or otherwise) can be completely eradicated. Furthermore, despite frequent attempts to develop interventions which promote positive body image and prevent mental health problems related to body image, the success of such programs has thus far been disappointing. Although some recent programs have shown promising results (e.g., Richardson & Paxton, 2010), the reported efficacy of past interventions as assessed on indices such as body dissatisfaction and disordered eating has typically been small or modest, and oftentimes absent (Littleton & Ollendick, 2003; Pratt & Woolfenden, 2002). There is a clear imperative for research which advances identification and understanding of factors which build resiliency against sources of body image concerns.

There is some preliminary evidence that improving ER may help to reduce body image-related problems. The "Everybody's Different Program" which includes a component on dealing with stress, has been reported to improve body image and eating attitudes in adolescents, and to be more effective than previous programs (O'Dea & Abraham, 2000). In addition, ER training has been reported to reduce binge eating, stress, and depressive symptoms in women with binge eating disorder (Clyne & Blampied, 2004) and new treatments targeting emotional functioning in anorexia nervosa are currently being trialed (e.g., MANTRA at the Institute of Psychiatry in London, see [www.eatingresearch.com](http://www.eatingresearch.com)).

In conclusion, the current study provides empirical support for the moderating role of ER in relationships between body image concerns and bulimic and depressive symptoms in adolescents. This is the first known study to examine these relationships and continued research is needed to more fully understand the underlying mechanisms. Despite this, ER and emotional functioning more generally, already show promise as effective targets for prevention and intervention strategies for body image and eating disorders.

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