

Research Report

Relations between negative affect, coping, and emotional eating

Sonja T.P. Spoor^{a,*}, Marrie H.J. Bekker^b, Tatjana Van Strien^c, Guus L. van Heck^b

^aDepartment of Psychology, University of Texas at Austin, TX, USA

^bDepartment of Psychology, Tilburg University at Tilburg, The Netherlands

^cDepartment of Psychology, Radboud University Nijmegen at Nijmegen, The Netherlands

Received 7 February 2006; received in revised form 11 October 2006; accepted 13 October 2006

Abstract

The study was designed to examine the relations between negative affect, coping, and emotional eating. It was tested whether emotion-oriented coping and avoidance distraction, alone or in interaction with negative affect, were related to increased levels of emotional eating. Participants were 125 eating-disordered women and 132 women representing a community population. Measures included the Positive and Negative Affectivity Schedule (PANAS), the Coping Inventory for Stressful Situations (CISS), and the Dutch Eating Behavior Questionnaire (DEBQ). Both emotion-oriented coping and avoidance distraction were related to emotional eating, while controlling for levels of negative affect. Negative affect did not have a unique contribution to emotional eating over and above emotion-oriented coping or avoidance distraction. The findings suggest that emotional eating is related to reliance on emotion-oriented coping and avoidance distraction in eating-disordered women as well as in relatively healthy women.

© 2006 Elsevier Ltd. All rights reserved.

Keywords: Negative affect; Coping; Emotional eating; Eating disorders

Introduction

It is widely accepted that emotional arousal leads to changes in eating behavior (Ganley, 1989; Greeno & Wing, 1994). Because physiological reactions to negative emotions or stress mimic the internal sensations associated with feeding-induced satiety, loss of appetite and decrease of food intake have been considered natural physiological responses to negative emotions (Schachter, Goldman, & Gordon, 1968). In contrast, an *increase* in food intake in response to negative emotions—emotional eating—has been considered to be an ‘inapt’ response (Heatherton, Herman, & Polivy, 1991). Negative emotions have been shown to result in overeating in obese individuals (e.g., Van Strien & Ouwens, 2003), in eating-disordered women (e.g., Agras & Telch, 1998), and in normal-weight dieters (e.g., Polivy, Herman, & McFarlane, 1994). It is therefore suggested that the relation between eating and emotion is influenced, at least partly, by particular characteristics of

an individual (Greeno & Wing, 1994; Schachter et al., 1968).

Several mechanisms have been proposed to explain this overeating in so-called emotional eaters. One such proposal focuses on learned inadequate affect regulation processes. According to the psychosomatic theory (Bruch, 1973; Kaplan & Kaplan, 1957) and more recently developed affect regulation models (e.g., Hawkins & Clement, 1984; McCarthy, 1990; Telch, 1997), emotional eaters overeat in response to negative affect because they have learned that it alleviates them from aversive mood states. Consistent with these theories, several studies found that an increase of manipulated negative affect was associated with an increase of eating in normal-weight and obese emotional eaters (e.g., Oliver, Wardle, & Gibson, 2000; Van Strien & Ouwens, 2003). Another theory, the escape theory (Heatherton & Baumeister, 1991), posits that overeating in response to negative emotions results from an attempt to escape or shift attention away from an ego-threatening stimulus that causes aversive self-awareness. In this view, threatening information about the self motivates emotional eaters to escape from self-awareness in order to avoid the

*Corresponding author. Tel.: +1 541 484 2123; fax: +1 541 484 1108.
E-mail address: sonjas@ori.org (S.T.P. Spoor).

aversive implications and negative affect. They seek to escape aversive self-awareness by focusing their attention on salient external stimuli, resulting in overeating. Results of a recent study indeed suggest that ego-threatening negative affect and high aversive self-awareness contribute to overeating in emotional eaters (Wallis & Hetherington, 2004).

Finally, according to the Restraint theory (Herman & Polivy, 1980), negative affect triggers overeating specifically among people who are restrained eaters. In support, many experimental studies using the original Restraint Scale (RS; Herman, Polivy, Pliner, Threlkeld, & Munic, 1978) have found that restrained eaters show disinhibition of restraint under conditions of negative emotions, while non-restrained eaters decrease their eating or do not change their food intake (e.g., Heatherton et al., 1991; Polivy et al., 1994). However, the link between dietary restraint and overeating was not replicated in experimental studies in which the restraint scales of the Dutch Eating Behavior Questionnaire (DEBQ; Van Strien, Frijters, Bergers, & Defares, 1986) or the Three-Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) were used (e.g., Chua, Touyz, & Hill, 2004; Lowe & Maycock, 1988; Van Strien, & Ouwens, 2003). A possible explanation for these inconsistent findings is a difference in measurement characteristics. The RS of the DEBQ and the TFEQ measure intended and actual control/restriction of food intake (Laessle, Tuschl, Kotthaus, & Prike, 1989). However, the RS includes items assessing not only restraint, but also disinhibition and weight fluctuation (Gorman & Allison, 1995). As a result, the RS may identify a different sort of dieter than the other restraint scales do. That is, the RS tends to select those dieters with a high susceptibility toward overeating. Therefore, overeating in response to emotional arousal may only occur in restrained eaters displaying both high restraint and a high tendency toward overeating (Van Strien, 1999). In support of this assumption, Williams et al. (2002) found that overeating following negative emotions only occurred in restrained eaters who also reported high levels of emotional eating. Overeating did not occur in restrained eaters reporting low levels of emotional eating. These findings indicate that dieting may set up a potential situation to overeat, but it is not a necessary precondition (Van Strien, 1999; Williams et al., 2002).

Thus, as posited by the affect regulation models and the escape theory, emotional eating may occur through a process of emotion regulation and avoidance of aversive mood states. However, a possible mechanism that might, at least partly, function as an underlying mechanism of this process is coping. That is, if emotional eaters try to regulate their emotions by overeating than it seems plausible that their coping strategies fail in down-regulating negative emotions. In an attempt to reduce these negative emotions, overeating may then occur as it is thought to temporarily provide comfort and distraction from aversive emotions.

Coping is a process by which an individual attempts to manage the demands that are perceived as stressful, as well as the emotions that are generated (Folkman & Lazarus, 1985). Endler and Parker (1994) have proposed three coping strategies: task-oriented, emotion-oriented, and avoidance coping. Task-oriented coping involves addressing the problem causing distress. Examples are making a plan of action or concentrating on the next step, and attempts to alter the situation. Emotion-oriented coping is a way of regulating emotions and is particularly aimed to ameliorate the negative emotions associated with the problem. This form of coping includes emotional responses, self-preoccupation and fantasizing. Finally, avoidance coping refers to the avoidance of stress by distracting oneself with a substitute task or by seeking social diversion, such as the company of other people.

Although Lazarus and Folkman (1984) have argued that coping strategies in and of themselves are neither adaptive nor maladaptive, several studies have found that task-oriented coping and avoidance by means of social diversion were either negatively related or unrelated to psychological dysfunction (Endler & Parker, 1990a, b), while emotion-oriented coping and avoidance by distraction were associated with psychological distress (i.e., depression) (e.g., Billings & Moos, 1984; Marx, Williams, & Claridge, 1992; McWilliams, Cox, & Enns, 2003; Turner, Larimer, Sarason, & Trupin, 2005). In addition, results of many studies have shown consistently that emotion-focused and avoidance distraction coping strategies are positively related to dieting, bingeing, and disordered eating attitudes (e.g., Ball & Lee, 2002; Denisoff & Endler, 2000; Fitzgibbon & Kirschenbaum, 1990; Freeman & Gil, 2004; Koff & Sangani, 1997).¹

Several studies have found strong cross-sectional and prospective associations between emotional eating and binge eating in non-clinical adolescent females as well as in eating-disordered females (Stice, Presnell, & Spangler, 2002; Van Strien, Engels, Van Leeuwe, & Snoek, 2005). For example, Stice et al. (2002) found that emotional eating was an important predictor for future binge eating in adolescent females. Furthermore, emotional eating has been shown to distinguish dieters with high versus low susceptibility toward failure of dietary restraint (Van Strien, 1997a, b; Van Strien, 1999). Therefore, the role of coping strategies in emotional eating might advance our understanding of this type of eating behavior as a possible etiological factor for the onset or progression of eating pathology.

¹It is important to note that the associations of emotion-oriented coping and avoidance distraction with negative outcomes might be the result of the way these coping strategies are measured (Stanton, Danoff-Burg, Cameron, & Ellis, 1994; Stanton, Kirk, Cameron, & Danoff-Burg, 2000). For example, Stanton and colleagues (Stanton et al., 1994) concluded that most emotion-oriented subscales contain solely distress-laden content or are confounded with distress, resulting in a positive relation with psychological distress.

Accordingly, the aim of the present study was to examine the associations between a reliance on particular coping strategies as measured by the Coping Inventory of Stressful Situations (CISS; Endler & Parker, 1990b) and emotional eating. If emotional eating may occur through learned inadequate affect-regulation processes, than it might be possible that emotional eaters highly rely on emotion regulation strategies that do not sufficiently ameliorate negative emotions. It was, therefore, hypothesized that a reliance on emotion-oriented coping would be positively associated with emotional eating. Furthermore, if emotional eating is associated with an escape of aversive mood states, then it might be expected that emotional eaters have a strong tendency to avoid facing problems. Although avoidance distraction and avoidance social diversion as measured by the CISS are considerably correlated with each other, they are assumed to be two separate factors (Cosway, Endler, Sadler, & Deary, 2000; Endler & Parker, 1990b). Therefore, the relation between avoidance and emotional eating was examined for both subscales separately. We hypothesized that avoidance distraction would be positively associated with emotional eating. However, because avoidance social diversion has found to be unrelated to psychological stress and eating pathology (Denisoff & Endler, 2000; Endler & Parker, 1990b; Koff & Sangani, 1997), we expected no association between avoidance social diversion and emotional eating. Finally, also no association was expected between task-oriented coping and emotional eating as it has been posited that problem-focused forms of coping do not fall under problematic emotion regulation (Folkman & Moskowitz, 2000).

An important factor to take into consideration is negative affect. Negative affect is a general dimension of subjective distress. Individuals with high levels of this trait are more likely to experience intense states of negative affect at all times and in any given situation, even in the absence of any overt stress (Watson & Clark, 1984). As emotional eaters increase their eating in response to negative emotions, it might be expected that higher levels of negative affect are associated with an increased level of emotional eating. Furthermore, high levels of negative affect have also been found to be associated with enhanced levels of emotion-oriented coping and avoidant forms of coping (Billings & Moos, 1984; Marx et al., 1992; McWilliams et al., 2003; Turner et al., 2005). In addition, several studies have found that the associations between emotion-oriented coping and avoidance distraction with disordered eating behaviors were moderated by depressive symptomatology (Bittinger & Smith, 2003; Paxton & Diggins, 1997; Tobin & Griffing, 1995). Therefore, it was hypothesized that negative affect, alone and in interaction with emotion-oriented coping and avoidance distraction, would be related to emotional eating.

We tested the relations between negative affect, coping and emotional eating in an eating-disordered sample of women as well as a community sample of women. Based on

results of earlier studies, it was hypothesized that eating-disordered women, compared to non-eating-disordered women, would report higher levels of negative affect and emotional eating (e.g., Bekker & Boselie, 2002; Cooper & Hunt, 1998; Pinaquy, Chabrol, Simon, Louvet, & Barbe, 2003) and would also score higher on assessment instruments of emotion-oriented coping and avoidance coping strategies (e.g., Kenardy, Arnou, & Agras, 1996; Nagata, Matsuyama, Kiriike, Iketani, & Oshima, 2000; Yager, Rorty, & Rossotto, 1995).

Methods

Procedure

A total of 153 eating-disordered women was approached through several Dutch mental health institutes, where they were treated as outpatients. Of these 153, 125 participated, a response rate of 82%. Questionnaires were given to the participants by their therapist at intake. Completed questionnaires were sent back by mail. All were diagnosed at intake by trained clinicians, using a semi-structured clinical interview including the criteria for eating disorders from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). Inclusion criteria were that participants were 18 years or older and had been diagnosed with an eating disorder by trained clinicians.

In addition to this eating-disordered sample, a community sample had been obtained. This sample is part of a larger sample of 373 women that participated in an earlier study. In that study, 225 women agreed to participate in future research. Of the 225 questionnaires mailed, 166 were returned, containing 132 complete test booklets, resulting in a 59% response rate. In total, 34 women filled in a non-response. The main reason given was 'no time to participate' (44%). Other reasons were 'no interest' (13%) and 'unable to participate' (12%). Thirty percent of the persons that returned a non-response did not give a particular reason. Unfortunately, it was not possible to collect reasons for not participating from women who did not send back a non-response.

Participants

The eating-disordered sample consisted of 31 women diagnosed with anorexia nervosa ($M = 26.10$ years, $SD = 8.04$), 40 women with bulimia nervosa ($M = 26.80$ years, $SD = 7.40$), 37 women with binge eating disorder ($M = 35.92$, $SD = 11.45$), and 15 women with eating disorder not otherwise specified ($M = 30.87$, $SD = 9.48$), as outlined in the DSM-IV-TR (APA, 2000). Of two women, the diagnosis was unknown due to anonymous participation ($M = 31.50$, $SD = .71$). Due to the small N of each diagnostic group and the considerable heterogeneity of symptoms within each diagnostic group, all

eating-disordered women ($M = 29.89$, $SD = 9.94$) were included in one sample.

The community sample reflected a heterogeneous group of 132 women ($M = 40.9$ years, $SD = 11.8$). They varied in age, occupation, family composition, and place of residence. Furthermore, the levels of education varied from lower vocational to university education. Nearly all respondents were born in the Netherlands (98%). Eating pathology in this community sample was low ($M = 1.10$, $SD = .90$) as measured by the total score on the Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994; Dutch version: Van Furth, 2000). More complete data about eating-disorder symptoms in this community sample have been presented elsewhere (Spoor, Bekker, Van Heck, Croon, & Van Strien, 2005).

Measures

Negative affect was measured with the 10-item subscale Negative Affectivity of the 20-item Positive and Negative Affectivity Schedule (PANAS; Watson, Clark, & Tellegen, 1988; Dutch version: Krijns, Gaillard, Van Heck, & Brunia, 1994). Negative affect is defined as a general dimension of subjective distress and unpleasurable engagement that contains a variety of aversive mood states (Watson et al., 1988). The Negative Affectivity subscale assesses five aversive mood states: distressed, angry, fearful, guilty, and jittery. The items are rated on 5-point Likert scales, ranging from 1, very slightly or not at all, to 5, very much, indicating the extent of experiencing each mood state. Findings on validity showed that the Positive Affectivity and Negative Affectivity scales have a good convergent and discriminant validity (Van Wijk & Kolk, 1996). In the present study, Cronbach α coefficients were .88 and .90 for the eating-disordered sample and the community sample, respectively.

The 48-item CISS (Endler & Parker, 1990b; Dutch version: De Ridder & Van Heck, 2004) was used to measure ways of coping. The CISS consists of three subscales: Emotion-oriented Coping, Task-oriented Coping, and Avoidance. Furthermore, the Avoidance subscale consists of two subscales, namely Avoidance Social Diversion (distracting oneself by seeking the company of other people) and Avoidance Distraction (distracting oneself with a substitute task). The items are rated on 5-point Likert scales, ranging from 1, not at all, to, 5, very much. The Dutch version of the CISS has found to discriminate between individuals diagnosed with psychiatric disorders and those without (De Ridder & Van Heck, 2004). Cronbach α coefficients for Emotion-oriented Coping were .85 for the eating-disordered sample, and .88 for the community sample. Cronbach α 's for Task-oriented Coping were .88 and .90 for the eating-disordered sample and the community sample, respectively. Cronbach α coefficients for Avoidance Social Diversion were .82 for the eating-disordered sample and .83 for the community sample. Finally, Cronbach α coefficients for Avoidance

Distraction were .66 and .71 for the eating-disordered sample and community sample, respectively.

The 13-item Emotional Eating subscale of the DEBQ (Van Strien, 2002) was used to measure emotional eating. Items are rated on 5-point Likert scales, ranging from 0, *never*, to 5, *always*. This scale is a valid and reliable instrument for evaluating emotional eating in normal subjects, women with eating disorders, and obese patients (Van Strien, 2002). Cronbach α coefficients were .96 for the eating-disordered sample, and .94 for the community sample.

Statistical analyses

For both samples, means and standard deviations were computed for all variables. Differences in scores between the two samples were tested by means of *t*-tests. Pearson correlation coefficients were used to examine the relations between negative affect, the four coping strategies, and emotional eating.

Hierarchical regression analyses were done to examine whether the four coping strategies, alone or in interaction with negative affect, were significantly related to emotional eating in the total sample, including both the eating-disordered sample and community sample. Task-oriented coping and emotion-oriented coping strategies are considered to be active ways of coping in that they are designed to change the nature of the stressor itself or how one thinks about it (Holahan & Moos, 1987). Therefore, controlling for one another would result in less of this active characteristic of the coping strategies. As a result, it was decided not to control for the other coping strategies, while analyzing the relation between a certain coping strategy and emotional eating. The variables were entered into the analyses in the following order: sample (0 = community sample; 1 = eating-disordered sample) (Step 1), negative affect and one of the coping strategies (Step 2), and interaction between negative affect and that specific coping strategy (Step 3). Prior to the regression analyses, negative affect and the four coping strategies were centered on their mean to maximize interpretability and minimize potential problems with multicollinearity (Aiken & West, 1991). To avoid overinterpreting the data and to adjust for the number of analyses being conducted, a Dunn–Sidak correction was applied (Sokal & Rohlf, 1995). The α level was adjusted downward to $p < .00127$.

With an N of 257, the power for detecting a medium effect size ($r = .30$) was high: .99 at $\alpha = .05$ (Cohen, 1988). The power for detecting a small effect size ($r = .14$) was moderate: .44 at $\alpha = .05$, suggesting that this effect size might have been inconsistently observed.

Results

Preliminary analyses

There were no significant differences in education and working hours between the two samples. More women in

Table 1
Means, mean score differences, and standard deviations

(Sub)scale	Eating disordered sample ($N = 125$)		Community sample ($N = 132$)		t
	M	SD	M	SD	
Negative affect	3.12	.80	1.88	.71	13.14***
Emotion-oriented coping	3.28	.62	2.38	.66	11.24***
Task-oriented coping	3.08	.60	3.39	.64	-3.95***
Avoidance social diversion	2.96	.85	3.26	.87	-2.84**
Avoidance distraction	2.62	.65	2.34	.64	3.43***
Emotional eating	3.46	1.08	2.56	.91	7.28***

Note: ** $p < .01$; *** $p < .001$.

the community sample were married and reported to have at least 1 child, compared to women in the eating-disordered sample ($p < .001$). In contrast, women in the eating-disordered sample more often reported to have a partner and living together compared to women in the community sample ($p < .001$).

Furthermore, the community sample was significantly older ($p < .001$). As age might be related to negative affect, the reliance on certain coping strategies or emotional eating in the community sample, Pearson product moment correlations were computed between age and our research variables. No significant correlations were found, except between age and avoidance distraction ($r = -.19$, $p < .05$). However, considering the only modest correlation between age and avoidance distraction, we decided not to control for age in the community sample. In addition, analyses also confirmed that sample status (eating disordered vs. community) did not moderate the examined relations.

Mean differences

Strong differences in mean scores were found between the eating-disordered sample and the community sample (see Table 1). The eating-disordered women reported higher levels of negative affect and scored higher on emotion-oriented coping and avoidance diversion. Furthermore, they reported a lower reliance on task-oriented coping and avoidance social diversion. They also ate more frequently because of negative emotions.

Correlations between the variables

In the eating-disordered sample, emotion-oriented coping and avoidance distraction were highly correlated with emotional eating (see Table 2). Furthermore, task-oriented coping and avoidance social diversion were unrelated with emotional eating. In addition, negative affect was unrelated to emotional eating.

Also in the community sample, emotion-oriented coping and avoidance distraction were related to higher levels of emotional eating (see Table 2). Furthermore, no association was found between task-oriented coping and emotional eating. Higher levels of avoidance social distraction

were related with higher scores on emotional eating.² Finally, negative affect was only modestly related to higher levels of emotional eating in the community sample.

In both samples, higher scores on negative affect were related to enhanced levels of emotion-oriented coping (see Table 2). Furthermore, negative affect was also related to higher levels of avoidance distraction, but only in the community sample. In both samples, the correlation between avoidance social diversion and avoidance distraction was significant but moderate. In addition, this correlation was much smaller in the eating-disordered sample, compared to the community sample.

Relations between negative affect, coping, and emotional eating

Only the unstandardized regression coefficients are displayed as several researchers have strongly recommended avoiding standardized coefficients for moderating models (e.g., Aiken & West, 1991; Jacckard & Turrissi, 2003). The regression coefficients in Step 2 present the effects of the predictor variable, taking into account each level of the other predictor variable. The unstandardized regression coefficients for the independent variables in Step 3 estimate the conditional relations, when the moderator equals zero. However, they are not given as they might differ depending on which product term is brought into the equation (Jacckard & Turrissi, 2003; Whisman & McClelland, 2005).

Emotion-oriented coping and avoidance distraction were strongly related to higher levels emotional eating (see Table 3). Task-oriented coping and avoidance social diversion were unrelated to emotional eating. Furthermore, there were no significant interactions between emotion-oriented coping and negative affect and between avoidance distraction and negative affect. Finally, negative affect was moderately associated with emotional eating when

²Partial correlations indicated that avoidance via social diversion and emotional eating were not significantly associated with each other when controlling for avoidance distraction ($r = -.14$, $p > .05$). In contrast, the partial correlation between avoidance distraction and emotional eating was significant ($r = .44$, $p < .001$). As a result, the significant relation found between avoidance social diversion and emotional eating might be explained by their association with avoidance distraction.

Table 2

Bivariate correlations between the variables in the eating disordered sample ($N = 125$) and the community sample ($N = 132$)

	1	2	3	4	5	6
Negative affect	—	.65***	-.16	-.06	.17	.17
Emotion-oriented coping	.63***	—	-.15	-.12	.27**	.28***
Task-oriented coping	-.10	.16	—	.36***	-.04	-.14
Avoidance social diversion	.01	.14	.41***	—	.21*	-.03
Avoidance distraction	.34***	.34***	.15	.41***	—	.43***
Emotional eating	.22*	.35***	.11	.19*	.36***	—

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

Eating disordered sample is depicted above the diagonal and the community sample below the diagonal.

Table 3

Main effects and moderator effects on emotional eating in total sample ($N = 257$)

Step	β at entry	R^2	R^2 change
1. Sample (0 = community sample; 1 = eating disordered sample)	.91**	.17	.17**
2. Negative affect	-.03		
Emotion-oriented coping	.51**	.25	.08**
3. Negative affect \times emotion-oriented coping	.07	.26	.01
2. Negative affect	.25*		
Task-oriented coping	.01	.20	.03
3. Negative affect \times task-oriented coping	-.04	.20	.00
2. Negative affect	.25*		
Avoidance social diversion	.09	.20	.03*
3. Negative affect \times avoidance social diversion	-.07	.20	.00
2. Negative affect	.13		
Avoidance distraction	.57**	.31	.14**
3. Negative affect \times avoidance distraction	.02	.31	.00

Note: * $p < .00127$ (Dunn–Sidak correction), ** $p < .001$.

controlling for task-oriented coping and avoidance social distraction, but was not significantly related to emotional eating when controlling for emotion-oriented coping and avoidance distraction. This finding indicates that negative affect did not have a unique contribution to emotional eating over and above emotion-oriented coping and avoidance distraction.

Discussion

In the present study, there was strong support for an association of emotion-oriented coping and avoidance distraction with emotional eating. That is, the reliance on these two coping strategies were related to higher levels of emotional eating. These results correspond to the associations found between emotion-oriented coping and avoidance distraction with problematic eating behaviors, such as binge eating (e.g., Fitzgibbon & Kirschenbaum, 1990; Freeman & Gil, 2004; Henderson & Huon, 2002). The findings are also consistent with the affect regulation models (e.g., McCarthy, 1990) and the escape theory (Heatherton & Baumeister, 1991), suggesting that overeating result from inadequate affect regulation and escape from negative emotions, respectively. It is possible that

emotional eaters may have fewer emotion-regulation strategies that effectively downregulate negative emotions. They may then try to escape from these emotions by means of overeating as they believe or have learned that eating can possibly reduce aversive emotions. Both the affect-regulation theory and the escape theory imply that emotional eating serves a strategic function as it is used to relieve negative emotions and aversive self-awareness. However, another possibility is that emotional eating is the result of being unable to effectively cope with negative emotions and aversive self-awareness. The results of the present study cannot empirically distinguish between these two explanations. However, the strong associations between emotional eating with emotion-oriented coping and avoidance distraction and the modest to non-significant associations of negative affect with emotional eating suggest that emotional eating serves a strategic attempt to reduce negative emotions.

The results of the present study also support the assumption that task-oriented coping is not associated with emotional eating, as no significant relation was found. Furthermore, as expected, the eating-disordered women, compared to the community sample, reported higher levels of negative affect, emotional eating, emotion-oriented

coping, and avoidance distraction, and lower levels of task-oriented coping and avoidance social diversion. Finally, negative affect was only moderately associated with emotional eating when controlling for task-oriented coping and avoidance social diversion, but no significant association was found when controlling for emotion-oriented coping and avoidance distraction. In addition, negative affect did not interact with emotion-oriented coping and avoidance distraction in its relation to emotional eating. These findings indicate that negative affect does not contribute strongly to emotional eating, supporting an individual difference model (Greeno & Wing, 1994; Schachter et al., 1968). It might be possible that the relation between negative affect and emotional eating is not so much direct, but indirect by means of other variables. For example, Van Strien and colleagues (2005) found that in eating-disordered women, the relation between negative affect and emotional eating was mediated by lack of interoceptive awareness. Another possible explanation in our study, however, might be that the measurement for negative affect that was used (PANAS; Watson et al., 1988) does not capture the extremes of affective disturbance that are of importance for emotional eating.

There are several limitations that must be considered. First, although the results imply that emotion-oriented coping and avoidance distraction are related to emotional eating, the cross-sectional nature of the study leads to an inability to determine a causal order among the variables. Other variables, not included in the study, can account for the found relations. For example, Whiteside et al. (in press) found that a variable that is strongly associated with emotional eating, i.e. binge eating, was related to specific types of emotion regulation difficulties, namely limited access to emotion-regulation strategies and difficulty identifying and making sense of emotional states. Furthermore, several studies have found that overeating in women with sub-threshold and threshold bulimia was associated with a general bias in the processing of threatening information (e.g., Meyer, Waller, & Watson, 2000; Waller & Mijatovich, 1998; Waller, Watkins, Shuck, & McManus, 1996). It might be possible that these variables result in a reliance on less-functional emotion-oriented coping strategies, avoidance distraction and emotional eating. Future randomized experiments would help to clarify these complex interrelations. Second, the sample was only moderately large, which possibly limits the stability and generalizability of the results. Furthermore, due to a small *N* of the separate diagnostic eating-disordered groups and the considerable heterogeneity of symptoms within each diagnostic group, the several diagnostic eating-disordered groups were combined into one sample. These limitations might have had some implications for the results. In addition, it might be possible that other variables, such as excessive dieting and compensatory behaviors, have played a role in the found associations between coping and emotional eating. Therefore, future research should examine the relations in larger samples of specific eating-

disordered groups. Third, the coping strategies were measured by the CISS (Endler & Parker, 1990b). This questionnaire measures only a few coping strategies and is by no means exhaustive. Furthermore, the items loading on the subscale emotion-oriented coping could be categorized as negative and likely ineffective emotional responses. Although other assessment instruments include more positive types of emotion-oriented coping, the CISS does not include these types of items. In all probability, the CISS would likely label this type of emotion regulation as task-oriented coping. Finally, the women participated voluntarily and it was not possible to investigate the reasons for non-responding of the other women. Therefore, selection effects cannot be ruled out.

Notwithstanding the limitations, the results of the present study provide support for the assumption that women scoring high on a measure of emotional eating reported significantly greater reliance on emotion-oriented coping and avoidance distraction. Furthermore, because these associations were found in eating-disordered women as well as in relative healthy women, the findings might indicate that these relations are relatively stable over females differing in eating pathology. However, in order to generalize this assumption, it will be important to attempt to replicate the current findings.

References

- Agras, W. S., & Telch, C. F. (1998). The effects of caloric deprivation and negative affect on binge eating in obese binge-eating disordered women. *Behavior Therapy, 29*, 491–503.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. text rev.). Washington, DC: Author.
- Ball, K., & Lee, C. (2002). Psychological stress, coping, and symptoms of disordered eating in a community sample of young Australian women. *International Journal of Eating Disorders, 31*, 71–81.
- Bekker, M. H. J., & Boselie, A. H. M. (2002). The role of gender and stress in gender role stress: A reexamination of the relationship between feminine gender role stress and eating disorders. *Stress and Health, 18*, 141–149.
- Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology, 46*, 877–891.
- Bittinger, J. N., & Smith, J. E. (2003). Mediating and moderating effects of stress perception and situation type on coping responses in women with disordered eating. *Eating Behaviors, 4*, 89–106.
- Bruch, H. (1973). *Eating disorders*. New York: Basic Books.
- Chua, J. L., Touyz, S., & Hill, A. J. (2004). Negative mood-induced overeating in obese binge eating: An experimental study. *International Journal of Obesity, 28*, 606–610.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cooper, M. J., & Hunt, J. (1998). Core beliefs and underlying assumptions in bulimia nervosa and depression. *Behaviour Research and Therapy, 36*, 895–898.
- Cosway, R., Endler, N. S., Sadler, A. J., & Deary, I. J. (2000). The Coping Inventory for Stressful Situations: Factorial structure and associations with personality traits and psychological health. *Journal of Applied Biobehavioral Research, 5*, 121–143.

- Denisoff, E., & Endler, N. S. (2000). Life experiences, coping, and weight preoccupation in young adult women. *Canadian Journal of Behavioural Science*, 32, 97–103.
- De Ridder, D., & Van Heck, G. L. (2004). *Coping Inventory for Stressful Situations. CISS, Dutch version*. Lisse, The Netherlands: Harcourt Test Publishers.
- Endler, N. S., & Parker, J. D. A. (1990a). Multidimensional assessment of coping: A critical evaluation. *Journal of Social and Personality Psychology*, 58, 844–854.
- Endler, N. S., & Parker, J. D. A. (1990b). *Coping Inventory for Stressful Situations (CISS): Manual*. Toronto, Canada: Multi-Health Systems.
- Endler, N. S., & Parker, J. D. A. (1994). Assessment of multidimensional coping: Task, emotion, and avoidance strategies. *Psychological Assessment*, 6, 50–60.
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16, 363–370.
- Fitzgibbon, M. L., & Kirschenbaum, D. S. (1990). Heterogeneity of clinical presentation among obese individuals seeking treatment. *Addictive Behaviors*, 15, 291–295.
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: A study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48, 150–170.
- Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *American Psychologist*, 55, 647–654.
- Freeman, L. M. Y., & Gil, K. M. (2004). Daily stress, coping, and dietary restraint in binge eating. *International Journal of Eating Disorders*, 36, 204–212.
- Ganley, R. M. (1989). Emotion and eating in obesity: A review of the literature. *International Journal of Eating Disorders*, 8, 343–361.
- Gorman, B. S., & Allison, D. B. (1995). Measures of restrained eating. In D. B. Allison (Ed.), *Handbook of assessment methods for eating behaviors and weight-related problems: Measures, theory and research* (pp. 149–184). Thousand Oaks, CA: Sage.
- Greeno, C. G., & Wing, R. R. (1994). Stress-induced eating. *Psychological Bulletin*, 115, 444–464.
- Hawkins II, R. C., & Clement, P. F. (1984). Binge eating: Measurement problems and a conceptual model. In R. C. Hawkins, W. J. Fremouw, & P. F. Clement (Eds.), *The binge purge syndrome: Diagnosis, treatment, and research* (pp. 229–251). New York: Springer.
- Heatherton, T. F., & Baumeister, R. F. (1991). Binge-eating as an escape from self-awareness. *Psychological Bulletin*, 110, 86–108.
- Heatherton, T. F., Herman, C. P., & Polivy, J. (1991). Effects of physical threat and ego threat on eating behavior. *Journal of Personality and Social Psychology*, 60, 138–143.
- Henderson, N. J., & Huon, G. F. (2002). Negative affect and binge eating in overweight women. *British Journal of Health Psychology*, 7, 77–87.
- Herman, C. P., & Polivy, J. (1980). Restrained eating. In A. Stunkard (Ed.), *Obesity* (pp. 208–225). Philadelphia, PA: Saunders.
- Herman, C. P., Polivy, J., Pliner, P., Threlkeld, J., & Munic, D. (1978). Distractibility in dieters and nondieters: An alternative view of “externality”. *Journal of Personality and Social Psychology*, 36, 536–548.
- Holahan, C. J., & Moos, R. H. (1987). Risk, resistance, and psychological distress: A longitudinal analysis with adults and children. *Journal of Abnormal Psychology*, 96, 3–13.
- Jackard, J., & Turrissi, R. (2003). *Interaction effects in multiple regression*. Thousand Oaks, CA: Sage.
- Kaplan, H. I., & Kaplan, H. S. (1957). The psychosomatic concept of obesity. *Journal of Nervous and Mental Disease*, 125, 181–201.
- Kenardy, J., Arnou, B., & Agras, W. S. (1996). The aversiveness of specific emotional states associated with binge-eating in obese subjects. *Australian and New Zealand Journal of Psychiatry*, 30, 839–844.
- Koff, E., & Sangani, P. (1997). Effects of coping style and negative body image on eating disturbance. *International Journal of Eating Disorders*, 22, 51–56.
- Krijns, P. W., Gaillard, A. W. K., Van Heck, G. L., & Brunia, C. H. M. (1994). Personality effects on brain potentials in an S1–S2 paradigm. *Personality and Individual Differences*, 16, 561–570.
- Laessle, R. G., Tuschl, R. J., Kotthaus, B. C., & Prike, K. M. (1989). A comparison of the validity of three scales for the assessment of dietary restraint. *Journal of Abnormal Psychology*, 98, 504–507.
- Lazarus, R. S., & Folkman, S. (1984). *Stress appraisal and coping*. New York: Springer.
- Lowe, M. R., & Maycock, B. (1988). Restraint, disinhibition, hunger and negative affect eating. *Addictive Behaviors*, 13, 369–377.
- Marx, E. M., Williams, J. M., & Claridge, G. C. (1992). Depression and social problem solving. *Journal of Abnormal Psychology*, 101, 78–86.
- McCarthy, M. (1990). The thin ideal, depression, and eating disorders in women. *Behavioral Research and Therapy*, 28, 205–218.
- McWilliams, L. A., Cox, B. J., & Enns, M. W. (2003). Use of the Coping Inventory of Stressful Situations in a clinical sample: Factor structure, personality correlates, and prediction of distress. *Journal of Clinical Psychology*, 59, 1371–1385.
- Meyer, C., Waller, G., & Watson, P. (2000). Cognitive avoidance and bulimic psychopathology: The relevance of temporal factors in a nonclinical population. *International Journal of Eating Disorders*, 27, 405–410.
- Nagata, T., Matsuyama, M., Kirriike, N., Iketani, T., & Oshima, J. (2000). Stress coping strategy in Japanese patients with eating disorders. *Journal of Nervous and Mental Disease*, 188, 280–286.
- Oliver, G., Wardle, J., & Gibson, E. L. (2000). Stress and food choice: A laboratory study. *Psychosomatic Medicine*, 62, 853–865.
- Paxton, S. J., & Diggins, J. (1997). Avoidance coping, binge eating, and depression: An examination of the escape theory of binge eating. *International Journal of Eating Disorders*, 22, 83–87.
- Pinaquy, S., Chabrol, H., Simon, C., Louvet, J.-P., & Barbe, P. (2003). Emotional eating, alexithymia and binge eating disorder in obese women. *Obesity Research*, 11, 195–201.
- Polivy, J., Herman, C. P., & McFarlane, T. (1994). Effects of anxiety on eating: Does palatability moderate distress-induced overeating in dieters? *Journal of Abnormal Psychology*, 103, 505–510.
- Schachter, S., Goldman, R., & Gordon, A. (1968). Effect of fear, food deprivation, and obesity on eating. *Journal of Personality and Social Psychology*, 10, 91–97.
- Sokal, R. R., & Rohlf, F. J. (1995). *Biometry, The principles and practice of statistics in biological research* (3rd ed.). New York, New York, USA: W. H. Freeman and Company.
- Spoor, S. T. P., Bekker, M. H. J., Van Heck, G. L., Croon, M. A., & Van Strien, T. (2005). Inner body and outward appearance: The relationships between appearance orientation, eating disorder symptoms and internal body awareness. *Eating Disorders: Journal of Treatment and Prevention*, 13, 479–490.
- Stanton, A. L., Danoff-Burg, S., Cameron, C. L., & Ellis, A. P. (1994). Coping through emotional approach: Problems of conceptualization and confounding. *Journal of Personality and Social Psychology*, 66, 350–362.
- Stanton, A. L., Kirk, S. B., Cameron, C. L., & Danoff-Burg, S. (2000). Coping through emotional approach: Scale construction and validation. *Journal of Personal and Social Psychology*, 78, 1150–1169.
- Stice, E., Presnell, K., & Spangler, D. (2002). Risk factors for binge eating onset in adolescent girls: A 2-year prospective investigation. *Health Psychology*, 21, 131–138.
- Stunkard, A. J., & Messick, S. (1985). The Three-Factor Eating Questionnaire to measure dietary restraint, disinhibition, and hunger. *Journal of Psychosomatic Research*, 29, 71–83.
- Telch, C. F. (1997). Skills training treatment for adaptive affect regulation in a woman with binge-eating disorder. *International Journal of Eating Disorders*, 22, 77–81.
- Tobin, D. L., & Griffing, A. S. (1995). Coping and depression in bulimia nervosa. *International Journal of Eating Disorders*, 18, 359–363.
- Turner, A. P., Larimer, M. E., Sarason, I. G., & Trupin, E. W. (2005). Identifying a negative mood subtype in incarcerated adolescents: Relationship to substance use. *Addictive Behaviors*, 30, 1442–1448.

- Van Furth, E. F. (2000). *Nederlandse vertaling van de EDE-Q [Dutch translation of the EDE-Q]*. Leidschendam: Robert-Fleury Stichting.
- Van Strien, T. (1997a). Are most dieters unsuccessful? An alternative interpretation of the confound of success and failure in the measurement of restraint. *European Journal of Psychological Assessment*, *13*, 186–194.
- Van Strien, T. (1997b). The concurrent validity of a classification of dieters with low versus high susceptibility toward failure of restraint. *Addictive Behaviors*, *22*, 587–597.
- Van Strien, T. (1999). Success and failure in the measurement of restraint: Notes and data. *International Journal of Eating Disorders*, *28*, 460–464.
- Van Strien, T. (2002). *Dutch Eating Behavior Questionnaire manual*. Bury St. Edmunds, England: Thames Valley Test Company.
- Van Strien, T., Engels, R. C. M. E., Van Leeuwe, J. F. J., & Snoek, H. M. (2005). The Stice model of overeating: Tests in clinical and non-clinical samples. *Appetite*, *45*, 205–213.
- Van Strien, T., Frijters, J. E. R., Bergers, G. P. A., & Defares, P. B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders*, *5*, 295–315.
- Van Strien, T., & Ouwens, M. A. (2003). Counterregulation in female obese emotional eaters: Schachter, Goldman, and Gordon's (1968) test of psychosomatic theory revisited. *Eating Behaviors*, *3*, 329–340.
- Van Wijk, C. M. T. G., & Kolk, A. M. (1996). Psychometric evaluation of symptom perception related measures. *Personality and Individual Differences*, *20*, 55–70.
- Waller, G., & Mijatovich, S. (1998). Preconscious processing of threat cues: Impact on eating among women with unhealthy eating attitudes. *International Journal of Eating Disorders*, *24*, 83–89.
- Waller, G., Watkins, H., Shuck, V., & McManus, F. (1996). Bulimic psychopathology and attentional biases to ego threats among non-eating-disordered women. *International Journal of Eating Disorders*, *20*, 169–176.
- Wallis, D. J., & Hetherington, M. M. (2004). Stress and eating: The effects of ego-threat and cognitive demand on food intake in restrained and emotional eaters. *Appetite*, *43*, 39–46.
- Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin*, *96*, 465–490.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*, 1063–1070.
- Whisman, M. A., & McClelland, G. H. (2005). Designing, testing, and interpreting interactions and moderator effects in family research. *Journal of Family Psychology*, *19*, 111–120.
- Whiteside, U., Chen, E., Neighbors, C., Hunter, D., Lo, T., & Larimer, M. (in press). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eating Behaviors*.
- Williams, J. M. G., Healy, H., Eade, J., Windle, G., Cowen, P. J., Green, M. W., et al. (2002). Mood, eating behaviour and attention. *Psychological Medicine*, *32*, 469–481.
- Yager, J., Rorty, M., & Rossotto, E. (1995). Coping styles differ between recovered and nonrecovered women with bulimia nervosa, but not between recovered women and non-eating-disordered control subjects. *Journal of Nervous and Mental Disease*, *183*, 86–94.