

Emotional awareness and emotional eating

Alice Moon and Howard Berenbaum

University of Illinois at Urbana-Champaign, Champaign, IL, USA

Two studies examined the relation between emotional awareness (attention to and clarity of emotions) and eating behaviours. In Study 1, college women ($n = 198$) completed measures of emotional awareness, emotional eating, and neuroticism. When all predictors were considered simultaneously, low attention to emotion was the only significant predictor of emotional eating. In Study 2, to test whether low attention to emotion would lead to increased eating in a laboratory setting, social anxiety was induced, and attention to emotion was manipulated experimentally in a sample of college women ($n = 100$). Women who reported low levels of trait attention to emotion who were also in the low attention to emotion condition had the greatest caloric consumption.

Much research has explored the relations between emotions and eating problems. Most of this research has explored the role played by unpleasant emotions (e.g., Stice, Akutagawa, Gaggan, & Agras, 2000). In fact, emotional eating, or excessive eating in response to negative emotional states (vanStrien, Frijters, Bergers, & DeFares, 1986), is considered a core feature of binge eating (e.g., Arnow, Kenardy, & Agras, 1995). The present research was based on the premise that emotional phenomena other than unpleasant emotion are also likely to play a role in unhealthy eating behaviours. In particular, the goal of the present research was to examine the relation between a particular aspect of emotion, emotional awareness, and a particular aspect of eating, emotional eating.

Emotional awareness can be divided into two distinguishable components (Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000, 2002): (1) the extent to which one attends to and values one's emotions and (2) the extent to which one can identify and describe one's own emotions. Keeping with

Correspondence should be addressed to: Howard Berenbaum, University of Illinois, Department of Psychology, 603 E Daniel Street, Champaign, Illinois, 61820, USA.
E-mail: hberenba@uiuc.edu

Study 2 of this paper was based on an honours thesis completed by the first author under the supervision of the second author. Alice Moon is now at the Department of Psychology at Stanford University.

the terms used by Gohm and Clore (2000, 2002) and Salovey, Mayer, Goldman, Turvey, and Palfai (1995), we will refer to these components as attention to emotion and clarity of emotions, respectively.

Several studies have examined the relation between emotional clarity and eating problems. Emotional clarity has been found to be lower in individuals with bulimia nervosa or binge eating disorder when compared to control participants (e.g., DeZwaan et al., 1995; Eizaguirre, de Cabezon, de Alda, Olariaga, & Juaniz, 2004). In addition, in a sample of obese adults, Larsen, van Strien, Eisinga, and Engels (2006) found that lower clarity of emotion was associated with higher levels of emotional eating. Since negative affect and the disposition to experience unpleasant emotional states (i.e., neuroticism) have been found to be associated with both low levels of emotional clarity (e.g., Gohm & Clore, 2002) and emotional eating (Heaven, Mulligan, Merrillees, Woods, & Fairouz, 2001), it is important to determine whether an association between emotional clarity and emotional eating is merely a reflection of their both being associated with neuroticism.

Past research has not examined whether emotional eating is associated with attention to emotion, though Larsen et al. (2006) found that in a sample of obese adults, emotional eating was not significantly associated with scores on the externally oriented subscale of the Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994), which is negatively correlated with attention to emotion (Coffey et al., 2003; Gohm & Clore, 2000). If emotional eating is influenced, at least in part, by difficulties in emotion regulation, then one ought to expect emotional eating to be associated with factors that are likely to hinder emotion regulation. One such factor is diminished attention to emotion. To the degree that individuals do not attend to their emotions, and attending to one's emotions makes it easier to regulate one's emotional state, one would expect low attention to emotions to be associated with the diminished ability to regulate emotions. It was for this reason that we hypothesised that lower levels of attention to emotion would be associated with higher levels of emotional eating.

We conducted two studies to examine whether emotional awareness was associated with emotional eating. We hypothesised that lower levels of attention to emotion would be associated with increased levels of emotional eating. In the first study, we examined whether emotional awareness was associated with self-reported emotional eating in a large sample of undergraduate women. Since past research has clearly demonstrated that neuroticism is associated with eating disturbances (e.g., Cassin & von Ranson, 2005), Study 1 also tested whether emotional awareness would continue to be associated with emotional eating when taking neuroticism into account. In Study 2, in which we induced social anxiety and observed how much participants ate following this mood induction, we tested whether manipulating emotional attention would be associated with an increased

likelihood of excessive eating. As in Study 1, we hypothesised that diminished attention to emotion would be associated with a greater likelihood of excessive eating.

STUDY 1

Methods

Participants

One hundred ninety-eight female undergraduate students enrolled in an introductory psychology course at a large Midwestern university received class credit for participating in this study. Participants ranged in age from 17 to 23 years ($M = 18.6$; $SD = 0.9$). The majority of the sample was White/European American (62.6%). The next largest ethnic groups were Asian American (17.7%), Latina (10.1%), and African American (5.6%).

Procedure

Participants completed questionnaire packets in groups of seven to ten. Participants were informed that the study examined personality, emotions, and eating habits.

Measures

Emotional awareness. Emotional attention and emotional clarity were measured using the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995). This measure of emotional awareness has been used in many previous studies across several areas of psychology (e.g., Gross & John, 2003; Kerns, 2006). The questionnaire asked participants to “indicate how much you agree or disagree with each of the following statements” on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). The Attention subscale is composed of 13 items such as “I pay a lot of attention to how I feel”. The internal consistency of the Attention subscale was .87 and the scores ranged from 28 to 65 ($M = 53.7$; $SD = 6.9$). The Clarity subscale is composed of 11 items such as “I am rarely confused about how I feel”. The internal consistency of the Clarity subscale was .81 and the scores ranged from 22 to 53 ($M = 37.8$; $SD = 6.6$).

Emotional eating. Emotional eating was measured using the 25-item Emotional Eating Scale (EES; Arnow et al., 1995). Participants were asked to “indicate the extent to which the following feelings lead you to feel an urge to eat” on a 5-point scale (0 = *no desire to eat*, 4 = *an overwhelming urge to eat*). Items included feelings such as “lonely”, “bored”, and “excited”. The

internal consistency of the EES was .89. Scores ranged from 4 to 81 ($M = 38.7$; $SD = 15.6$). Two participants did not complete this scale.

Neuroticism. Neuroticism was measured using the 10 emotional stability items from the 50-item version of the International Personality Item Pool (IPIP; Goldberg, 1999). This measure of neuroticism has been used in many previous studies across several areas of psychology (e.g., Tamir, 2005). The instructions asked participants to “describe how accurately each statement describes *you*” using a 5-point rating scale (1 = *very inaccurate*, 5 = *very accurate*). A sample item is: “Get stressed out easily”. The internal consistency of this scale was .87. Scores were computed so that higher scores reflect greater levels of neuroticism; they ranged from 12 to 48 ($M = 29.7$; $SD = 7.2$). One participant did not complete this questionnaire.

Results

Emotional eating was significantly correlated with both emotional attention, $r = -.18$, $p < .05$, and emotional clarity, $r = -.18$, $p < .05$, but was not significantly correlated with neuroticism, $r = .12$, $p > .05$. We conducted a regression analysis to examine which of these variables would be associated with emotional eating when all three (i.e., attention to emotions, clarity of emotions, and neuroticism) were considered simultaneously. When these variables were entered simultaneously, the regression model explained a significant proportion of variance in emotional eating scores, $R^2 = .04$, $F(3, 191) = 3.82$, $p = .01$. Whereas attention to emotion was a significant predictor of emotional eating, $\beta = -.34$, $p < .05$, clarity of emotion, $\beta = -.25$, $p > .10$, and neuroticism, $\beta = .19$, $p > .10$, were not significant predictors. Thus, the results of Study 1 suggest that elevated levels of emotional eating are associated with diminished attention to emotion.

STUDY 2

Methods

Participants

One hundred female undergraduate students enrolled in an introductory psychology course at a large Midwestern university received class credit for participating in the experiment. Participants ranged in age from 18 to 21 years ($M = 18.7$; $SD = 0.8$). The majority of the sample was White/European American (66%). The next largest ethnic groups were Asian American (14%), Latina (7%), and African American (6%).

Procedure

Participants were tested individually on a single occasion. To induce social anxiety, we used a mood induction somewhat similar to that developed by Beidel, Turner, Jacob, and Cooley (1989) and used since in numerous studies (e.g., Hofmann, Newman, Ehlers, & Roth, 1995). Whereas Beidel et al. (1989) told participants that they would be giving a speech and being evaluated, we told participants that they would be meeting a male research participant and that they would be evaluating each other. Past research has found that participants' reported anxiety and heart rates increase in anticipation of social evaluation (e.g., Hofmann et al., 1995). When participants arrived in the laboratory, they were informed that they would interact with a male participant for about ten minutes and then both they and the male participant would complete a questionnaire about the impressions they had of each other (the "First Impression Scale" described later), along with questionnaires describing themselves. The male participant, however, did not actually exist, but was fabricated so the participant would feel anxious about the prospect of meeting and interacting with a member of the opposite sex.

Participants were asked to leave their belongings in the laboratory and were escorted to another room where they would supposedly be interacting with the male participant. They were told that the other participant had not yet arrived and that once he did, he would also be brought into the room for the interaction. This room contained two chairs facing each other with a small table in between where there was a platter placed on top of it. The platter had eight chocolate chip cookies and 36 potato chips on it. The food was visible to the participant and was within arm's reach.

There were two conditions: a high attention condition and a low attention condition. Half of the participants were assigned to the high attention condition and the other half were assigned to the low attention condition. The participants were randomly assigned to these conditions by alternating assignments to the conditions (i.e., first participant in the high attention condition, second in the low attention condition, third in the high attention condition, and so on).

The participants in the high attention condition were given a clipboard with two questionnaires: (a) the First Impression Scale; and (b) a mood checklist. The First Impression Scale was a 10-item questionnaire that was designed for this study to help induce social anxiety by leading the participant to believe that the study was about first impressions. The questionnaire asked the participants to rate their partner on the following dimensions: "attractive", "humorous", "unique", "friendly", "intelligent", "genuine", "caring", "composed", "pleasant/agreeable", and "articulate". However, this questionnaire was not actually intended to be completed by

participants because, as mentioned earlier, the interaction was never to take place. Participants were told to look over the First Impression Scale while waiting to get a sense of what characteristics they were looking for in the male participant during the interaction. They were also instructed to complete the mood checklist as soon as the experimenter left the room. The participants in the low attention condition were given a clipboard with only the First Impression Scale. They were given the same instructions as the participants in the high attention condition to look over the First Impression Scale. Thus, the attention manipulation consisted of participants in the high attention condition completing a mood checklist,¹ whereas participants in the low attention condition did not. On the experimenter's way out of the room, she said to all participants, "Oh, and you can have some food if you want."

After 10 minutes, the experimenter returned and told the participants that the male participant still had not arrived and would no longer be able to receive credit for participation because he was too late. The experimenter assured the participants that although they were unable to participate in the interaction, they could still receive credit after filling out some questionnaires (including the TMMS²) back in the laboratory.

After the experiment, participants were fully debriefed in writing and a post-debriefing consent form was provided. All 100 participants provided consent to use the data obtained after the true purpose of the study was revealed.

Measures

Food consumption. After each participant left, the number of chips and cookies that were eaten was counted and recorded. The amount eaten was then converted into caloric intake for analysis. Each chip contained 11.5 calories and each cookie contained 53.3 calories.

Emotional awareness. As in Study 1, trait levels of emotional attention and emotional clarity were measured using the TMMS (Salovey et al., 1995). The internal consistency of the Attention subscale was .86 and the scores ranged from 25 to 63 ($M = 52.2$; $SD = 7.4$). The internal consistency of the Clarity subscale was .85 and the scores ranged from 15 to 53 ($M = 37.3$; $SD = 7.5$).

¹ Among women in the high attention condition, there was a rather weak, but statistically significant, relation between negative affect scores and caloric consumption, with higher state negative affect associated with fewer calories (standardised coefficient = $-.04$, $p < .01$).

² Individuals in the low and high attention conditions did not differ significantly in either attention to emotion, $t(98) = -0.03$, $p > .05$, or clarity of emotion $t(98) = -0.91$, $p > .05$.

Results

Approximately one-third (36%) of participants ate during the experiment. Of the participants who ate, caloric intake ranged from 11.4 calories to 438.9 calories ($M = 101.8$, $SD = 97.9$). To examine whether the attention condition, trait emotional awareness (emotional attention in one regression, and emotional clarity in the other regression), or the interaction between the experimental condition and trait emotional awareness scores predicted eating, we conducted zero-inflated Poisson regression analyses. We conducted such analyses, rather than ordinary regression analyses, for two reasons: (1) the caloric consumption scores were not normally distributed, with the modal score being zero—Poisson regression analyses are ideal for examining such distributions; and (2) Poisson regression analyses also enabled us to test the existence of excess zeros (i.e., the probability that no calories were consumed). Centred emotional awareness scores were used in the regression analyses.

The results of Study 2 were consistent with the results of Study 1 in that emotional attention was associated with number of calories consumed. The zero-inflated Poisson regression model predicting calories from the attention condition, trait attention to emotion, and the trait attention to emotion \times attention condition interaction was statistically significant, $\chi^2(3, N = 100) = 229.55$, $p < .01$. Moreover, as can be seen in Table 1, all three variables were statistically significant in predicting number of calories ($ps < .01$). Being in

TABLE 1
Results from zero-inflated Poisson regression predicting calories

	<i>B</i>	<i>SE</i>	<i>z</i>	<i>p</i>
<i>Count coefficients</i>				
Attention condition	-0.17	0.04	-4.89	.00
Trait attention	-0.20	0.02	-12.34	.00
Trait attention \times attention condition	0.28	0.03	9.33	.00
<i>Excess zeros probit coefficients</i>				
Attention condition	-0.56	0.43	-1.31	.19
Trait attention	0.51	0.32	1.61	.11
Trait attention \times attention condition	-0.29	0.43	-0.67	.50
<i>Count coefficients</i>				
Attention condition	-0.33	0.03	-9.77	.00
Trait clarity	0.10	0.02	4.30	.00
Trait clarity \times attention condition	0.21	0.04	5.71	.00
<i>Excess zeros probit coefficients</i>				
Attention condition	-0.52	0.42	-1.24	.22
Trait clarity	-0.13	0.29	-0.47	.64
Trait clarity \times attention condition	0.20	0.43	0.46	.64

the low attention condition and having low trait attention to emotion both predicted greater caloric consumption.

To illustrate the nature of the interaction between attention condition and trait attention to emotion, we divided participants into those who did versus did not eat more than the equivalent of a single serving of snack (3 cookies or 14 chips, or any combination exceeding 160 calories). To compare participants with lower levels of trait attention to emotion and higher levels of trait attention to emotion, participants were divided into high versus low trait attention based on whether their scores on the Attention subscale were above or below the median. There were 24 women in the low attention condition with low trait attention, 26 women in the low attention condition with high trait attention, 23 women in the high attention condition with low trait attention, and 27 women in the high attention condition with low trait attention. The percentages of women in each condition who ate more than a single snack serving are presented in Figure 1. As can be seen in Figure 1, the likelihood of eating more than a single snack serving was particularly high among individuals in the low attention condition whose trait levels of attention to emotion were below the median. In the low attention condition, low trait attention to emotion predicted eating more than a single snack serving. In contrast, in the high attention condition, trait attention to emotion did not make much of a difference.

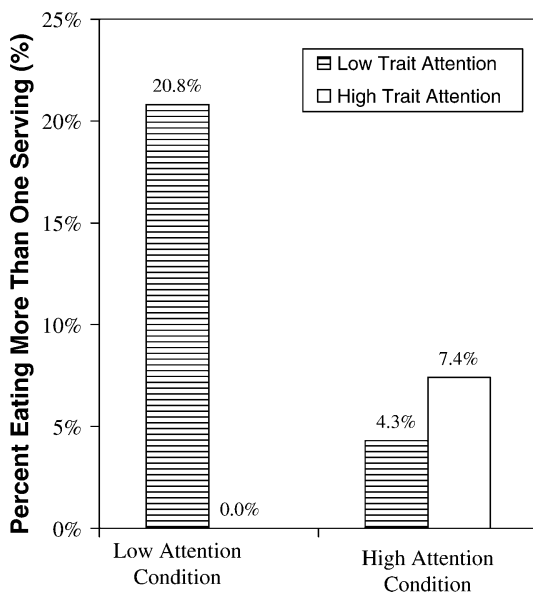


Figure 1. Percentage of individuals who ate more than a single snack serving as a function of attention condition and trait attention.

Two participants ate more than 400 calories. This was more than twice as much as the other participants, who all ate less than 200 calories. Both of these participants were in the low attention condition and had trait levels of attention to emotion below the median.

The zero-inflated Poisson regression model predicting calories from the attention condition, trait clarity of emotion, and the trait clarity of emotion \times attention condition interaction was statistically significant, $\chi^2(3, N = 100) = 210.21, p < .01$. However, the findings were in the opposite direction of Study 1. Specifically, in Study 2, increased caloric consumption was associated with increased, rather than decreased, clarity of emotion.

None of the variables in either regression analysis (using trait attention to emotion or using trait clarity of emotion) significantly predicted excess zeros, or whether or not a participant ate.

DISCUSSION

The results of the present research were consistent with our hypothesis that emotional awareness plays a role in at least some aspects of unhealthy eating. In particular, we found consistent evidence of low levels of attention to emotion being associated with higher levels of emotional eating. In Study 1, we found that women who reported paying less attention to their emotions tended to report engaging in more emotional eating. Moreover, we found that the association between attention to emotion and emotional eating could not be accounted for by shared variance with neuroticism. In Study 2, we replicated the finding of Study 1 that lower levels of trait attention to emotion were associated with more eating. Further, in Study 2 we found that manipulating whether women completed a mood checklist, intended to manipulate attention to emotion, influenced how much women ate (particularly those women who were low in trait attention to emotion). These findings suggest that attention to emotion may play a causal role in influencing emotional eating.

The present research examined an important issue not addressed in previous research, namely the association between emotional awareness and emotional eating. Although our results suggest that attention to emotion and emotional eating are associated, a number of questions remain unanswered. For instance, the results concerning the second facet of emotional awareness, clarity of emotions, were inconsistent across the two studies. It will therefore be important for future research to determine whether and how emotional clarity is associated with emotional eating. Another question concerns the generalisability of our findings. We studied college women because they are at particularly high risk for disturbed eating behaviours (e.g., Katzman, Wolchik, & Braver, 1984). It will be beneficial for

future research to examine the relation between emotional awareness and emotional eating in other populations, including men and individuals of varying ages. It will also be valuable to examine the relation between attention to emotion and emotional eating in more natural settings, perhaps using diary studies or event sampling methods.

In Study 2, we used a social anxiety mood induction that would likely have raised women's concerns about their body image. In all likelihood, this induction was not equally effective for all participants. However, there is no reason to expect women low in attention to emotion to be especially sensitive or insensitive to a social anxiety mood induction. Even if women low in attention to emotion are especially sensitive to such a mood induction, it would not explain the attention condition \times trait attention interaction. It will be important for future research to examine the specific conditions under which low attention to emotion is associated with emotional eating. For example, might low attention to emotion also contribute to emotional eating when people are angry or happy, or when concerns are raised about their academic or professional achievement?

In Study 2, we attempted to manipulate attention to emotion by having individuals in the high attention condition complete a mood checklist. We did not conduct a manipulation check because doing so would likely have ruined the manipulation. However, we are confident that the manipulation was successful for two reasons. First, as we expected, the manipulation interacted with trait attention to emotion to predict caloric consumption. The attention manipulation had an impact on eating among individuals low in trait attention to emotion but not among individuals high in attention to emotion. Thus, whatever we manipulated was sensitive to trait attention to emotion. It makes sense that the attention manipulation did not make a difference among individuals high in trait attention since they would be likely to attend to their emotions regardless of the condition. The second reason we have confidence in the success of the attention to emotion manipulation is that the results of Study 2 converged with the results of Study 1. Unfortunately, we cannot be certain that the impact of our manipulation can be attributed to participants in the high attention condition actually paying more attention to their emotions than individuals in the low attention condition. For example, the manipulation could have influenced eating by altering the impact of the anxiety induction. However, even if this were the case, it raises the question of why individuals in the high attention condition would have had more intense emotional reactions given that the manipulation consisted of nothing more than exposure to emotional information (in the form of completing a mood checklist). Even if we are mistaken that completion of the mood checklist influenced attention to emotion, it remains the case that in Study 2 lower levels of trait attention to

emotion were associated with greater caloric consumption, replicating the results of Study 1.

In Study 2, only 36 of 100 participants ate during the experiment. This could be due in part to the way the study was carried out. It is possible that being in a laboratory setting discourages eating, or that some participants saw through our deception. However, there is no reason to expect such factors to have led to an attention condition \times trait attention interaction. Moreover, there were two outliers who both consumed more than 400 calories in 10 minutes. This finding suggests that excessive eating under these conditions and the directive given did not prohibit eating. Furthermore, it is worth noting that both of these women had low trait attention to emotion and were in the low attention condition. There is clearly a need for future research to verify that low levels of attention to emotion are associated with clinically significant levels of emotional eating. Toward that end, we recommend examining the relation between attention to emotion and both bulimia and binge eating disorder. When conducting such research, however, we urge researchers to explore the possibility that there may be a distinct subset of individuals with such clinical conditions who engage in excessive emotional eating due to diminished attention to their own emotions.

The finding that low levels of attention to emotion are related to high levels of emotional eating has potential implications for the treatment of eating problems. For instance, treatments that incorporate mindfulness and acceptance techniques, which both teach individuals to be more aware of their emotional experiences, could be useful in treating emotional eating. Consistent with this possibility, there has been preliminary evidence that Dialectical Behaviour Therapy (which teaches mindfulness along with other emotion regulation skills) is an effective therapy in treating both bulimia nervosa and binge eating disorder (Safer, Telch, & Agras, 2001; Telch, Agras, & Linehan, 2001). Moreover, Baer, Fischer, and Huss (2005) presented a case study suggesting that Mindfulness-Based Cognitive Therapy (MBCT), which also uses training in mindfulness skills, can be an effective treatment for emotional eating. It is possible that one reason for the effectiveness of DBT and MBCT was that they led clients to be more attentive to their emotions. The findings of the present research suggest that another approach, Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), which incorporates both mindfulness and acceptance, may also be valuable in treating emotional eating.

Past theorising and research concerning emotional processes and unhealthy eating has focused primarily on negative affect. The results of this research provide converging evidence from two different types of studies, correlational and experimental, that suggests that attention to emotion may play an important role in at least some forms of unhealthy eating. Thus, in order to understand, prevent, and treat eating disturbances, it will likely be

important to examine different kinds of emotional processes and disturbances (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003) and not just negative affect.

Manuscript received 31 July 2008

Revised manuscript received 14 November 2008

Manuscript accepted 20 December 2008

First published online 29 January 2009

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