DEVELOPMENT AND EVALUATION OF A NOVEL INTERNET-BASED GUIDED SELF-HELP INTERVENTION FOR THE REDUCTION OF EMOTIONAL EATING

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Abstract

Increasing caloric intake in response to stress or negative affect is referred to as emotional eating. Emotional eating has been cited as a factor related to elevated weight status and difficulty achieving and maintaining weight loss, but an intervention specifically targeting reductions in emotional eating has yet to be developed. The present study aimed to develop an Internet-based guided self-help program targeting a reduction in emotional eating (the RedEE Program). Undergraduate men and women (N=59) reporting a desire to reduce episodes of emotional eating were randomly assigned to either an intervention or waitlist condition. Participants in the intervention condition were given access to the RedEE Program during the first six weeks of the study period. Measures of emotional eating, loss of control over eating, and affect were assessed at baseline, 6-weeks, and 12-weeks. Participants who completed at least a portion of the intervention endorsed significantly lower levels of emotional eating, desire to eat in response to depressive emotions, loss of control over eating, and negative affect at the 6-week assessment compared to participants in the waitlist group. Only 36% of participants in the intervention condition completed the full RedEE Program. However, the majority of participants in the intervention group utilized at least a portion of the program with high acceptability and overall satisfaction.
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Development and evaluation of a novel internet-based guided self-help intervention for the reduction of emotional eating

The medical complications associated with obesity are well documented, ranging from high blood pressure and coronary heart disease to diabetes and metabolic syndrome (Aronne, 2002; Burton & Foster, 1985; Kopelman, 2007; Mokdad et al., 2003). In the United States, 69.2% of adults over the age of 20 were either overweight or obese in 2009 - 2010 (Flegal, Carroll, Kit, & Ogden, 2012). Once weight gain has occurred, weight loss becomes difficult to achieve and maintain, with studies indicating that at least 50% of weight loss patients are likely to return to their baseline weight within five years of completing a formal weight loss program (Wadden, Sternberg, & Letizia, 1989). Even among individuals who undergo bariatric surgery for weight loss, weight regain is a notable problem, with 30-50% of individuals regaining weight only 24 months following surgery (Hsu et al., 1998; Magro, Geloneze, Delfini, Pareja, Callejas, & Pareja, 2008). The high prevalence of obesity, combined with the poor outcomes of current surgical and behavioral weight loss treatments, have led researchers to explore obesity from both a treatment and prevention perspective. Numerous studies have aimed to identify the factors that contribute to successful weight loss, as well as the promotion and maintenance of healthy weight, with mixed success. One factor that has been often overlooked when considering both the prevention and treatment of obesity is an individual’s response to stress and negative affect.

Approximately 40% of individuals increase their caloric intake when stressed, approximately 40% decrease caloric intake, and approximately 20% do not experience any changes in caloric consumption when under stress (Dallman, 2010). The phenomenon of increasing food consumption in response to changes in affect is referred to as emotional eating. The occasional increase in food consumption to relieve distressing emotions is not in itself
problematic. However, the association between the consumption of highly palatable food and the alleviation of a negative emotional state can be negatively reinforcing. When this reinforcement occurs on a regular basis, emotional eating can become a problematic, repeated behavior that leads to negative psychological and physical consequences.

Emotional eating has been noted in the literature as a factor associated with elevated weight status and difficulty achieving and maintaining weight loss (Canetti, Berry, & Elizur, 2009; Geliebter & Aversa, 2003; Rusch, Andris, & Wallace, 2009). It shares features with binge eating and loss of control over eating and can lead to additional emotional distress among some individuals (Colles, 2008; Fischer et al., 2007). Clinicians and researchers have identified emotional eating as a problematic phenomenon that impacts both clinical and non-clinical populations. However, emotional eating has not in itself been examined as a specific target of treatment. Despite the high prevalence of emotional eating and its association with elevated weight, there is currently no formal, widely available treatment for emotional eating. The present study aims to address this largely neglected factor through the development and evaluation of an online self-help intervention for emotional eating.

**Biological Models of Emotional Eating**

The balance between biological, psychological, and environmental influences on eating behavior in response to a stressor is currently unclear. Although animal models do not account for many of the human factors related to food choice (e.g., financial status, beliefs about weight and appearance, attitudes towards food), they can provide insight into some of the basic biological factors related to stress and food consumption. Dallman (2010) has utilized studies of rats to identify a biological pathway by which eating in response to a stressor can become a reflexive action. When rats are presented with a stressor, glucocorticoids (GCs) are secreted.
These increased GC levels are linked to a host of emotional and physiological changes, including increases in motivation and wanting, increased secretion of corticotrophic releasing factor (CRF), increased caloric intake, and increased insulin production (Dallman, Pecoraro, & la Fleur, 2005). Insulin regulates the metabolism of carbohydrates and fats, and has been shown to regulate food selection in rats, with increased insulin levels leading to increased consumption of fat and sugar (Dallman, 2010). Studies have demonstrated that chronic, mild stressors lead rats to increase consumption of sweet and palatable food and liquid, which leads to subsequent weight gain (Adam & Epel, 2007; Pecoraro, Reyes, Gomez, Bhargava, & Dallman, 2004). However, when highly palatable food and drink are not available and only ordinary rat chow is present, chronically stressed rats consume less of the chow than normal and subsequently lose weight (Dallman, Pecoraro, & la Fleur, 2005). Therefore, when the stress-response pathway is activated, a series of physiological changes leads to increased insulin production and increased consumption of fat and/or sugar, which acts on a feedback loop to reduce the overall activity of the stress response system, causing a reduction in the experience of stress (Foster et al., 2009).

In both acute and chronic stress conditions, activity of the stress-response system (i.e. CRF expression) is reduced when rats are given the opportunity to eat fat or sugar in addition to their normal rat chow (Dallman, Pecoraro, & la Fleur, 2005; Dallman, 2010). When a rat is chronically stressed, this pathway becomes known as the chronic stress response network and leads to both increased mesenteric fat and a dampened stress response (Dallman, 2010). Furthermore, GCs and CRF play a role in learning and memory. The initial increase in GCs and CRF during the activation of the stress-response pathway can heighten the learned association between encountering a stressor, consuming highly palatable foods, and experiencing relief, at
least in the biological sense. As this pattern is repeated, the biological and learned response can lead to habit formation in rats.

Among humans, habitual behaviors override behaviors based on higher-level decision making when an individual is stressed (Schwabe & Wolf, 2009; 2011). Indeed, habit strength has been shown to predict consumption of unhealthy snacks in normal weight undergraduate women (Adriaanse, de Ridder, & Evers, 2011). The process of habit formation surrounding eating behavior and negative affect among humans suggests that biological models of stress-induced eating among animals may also apply to humans.

Tomiyama and colleagues (2011) have taken animal models of stress-induced eating and the chronic stress response network and evaluated whether the models hold in humans. Chronically stressed, healthy, normal weight women who were high in perceived stress were higher in emotional eating, BMI, and abdominal obesity (assessed via sagittal diameter) than their low-perceived-stress counterparts. When placed in a stress-inducing situation, women high in perceived stress experienced a blunted cortisol response, suggesting they had adapted to chronic levels of stress. This finding supported the animal model of the chronic stress response network among some humans. Based on this model, an acute stressor activates the stress response pathway, which can lead to an increase in the consumption of highly palatable food. When chronically activated, the increase in caloric consumption can lead to both weight gain through the storage of excess fat and to an overall dampening of the physiological response to subsequent stressors.

Although a biological model may partially explain the experience of emotional eating among humans when highly palatable foods are present, a recent study suggests that consumption of these foods does not significantly reduce negative affect. Wagner and colleagues
(2014) induced negative affect in undergraduate students and then presented them with either palatable foods they had identified as “comfort foods,” palatable food not identified as comfort food, or no food. Negative affect was significantly reduced among participants in all conditions within only three minutes and there were no significant differences between the three groups. For all participants, mood improved over time, regardless of whether or not comfort food was consumed. Among those participants who ate their specified comfort food, it was likely the time that elapsed while eating rather than the food itself that led to a reduction in negative affect, and the same may be true for emotional eaters. This study suggests there may be an interaction between the biological response to stress and cognitive factors such as beliefs about the link between eating and stress. For some individuals, beliefs about the link between eating and stress may be driving emotional eating behavior more than an actual reduction in distress based on the impact of highly palatable foods on the stress response network. However, the study used a healthy undergraduate sample and did not differentiate between those who were high or low in emotional eating. While the study suggests that food does not alleviate negative affect above and beyond the effect of time, it is possible that different results may have emerged for individuals high in emotional eating or those with persistent negative affect. Additionally, food consumption may have a different impact on mood when changes in emotion occur in a natural setting rather than when they are induced in a laboratory.

**Emotional Eating and Weight Status**

Among humans, increased food consumption can occur in response to both positive and negative emotions. It has been demonstrated that food choice differs by emotional status, with individuals consuming more-hedonic foods when in a negative mood state and less-hedonic foods when in a positive emotional state (Garg, Wansink, & Inman, 2007). Mood-based
differences in eating behavior have also been identified across weight categories. One study used a self-report measure of appetite to compare eating habits of underweight, normal weight, and overweight men and women across a variety of hypothetical positive and negative emotions and situations (Geliebter & Aversa, 2003). Overweight individuals reported being significantly more likely to eat in response to negative emotions and situations (e.g. when alone, after an argument, after losing money) than individuals in the normal or underweight groups. Individuals in the underweight and normal weight groups reported being more likely to eat in response to positive situations (e.g., while engaged in a hobby, after hearing good news) than overweight individuals. Although the study measured desire to eat rather than actual eating behavior, the difference in weight status among those who reported a desire to eat in response to positive and negative emotions may be partially explained by the differences in food choice outlined by Garg and colleagues (2007). The results from both studies indicate that increased eating in response to positive emotions is less concerning for overall weight status and is therefore less of a focus for the present study. Eating in response to negative emotions and situations can lead to increased consumption of highly palatable foods in the absence of hunger. In turn, excessive increased consumption may lead to eventual weight gain.

In addition to the findings regarding hypothetical positive and negative emotional states, Costarelli and Patsai (2012) examined the effects of stress on emotional eating by comparing self-report measures completed by participants during a control period and during an examination stress period. Self-reported emotional eating was correlated with self-report measures of stress during the examination period, but not during the control period, indicating that emotional eating may be more prominent during times of high stress. Although Geliebter and Aversa (2003) found that normal weight women were less likely to eat in response to
negative emotions than overweight women, Costarelli and Patasai (2012) found that some normal weight undergraduate women did endorse eating when stressed. Additionally, they indicated that their preferred foods during periods of stress were chocolate, crisps, and ice cream. Although overeating in response to stress or negative affect may be more common among overweight women, normal weight women who endorse emotional eating report choosing highly palatable foods that, over time and under chronically stressful circumstances, may lead to weight gain.

Emotional eating appears to occur at a higher rate among overweight and obese individuals, but not all individuals with an elevated weight status engage in emotional eating. While biological models offer an explanation for why emotional eating can occur, they do not distinguish between groups of people who alter their eating behavior in response to stress and those whose eating behavior does not change. Trait anxiety has been identified as a factor that may increase vulnerability to emotional eating among obese individuals (Schneider, Appelhans, Whited, Oleski, & Pagoto, 2010). Obese individuals high in trait anxiety consumed a greater amount of highly palatable food following the recollection of an anxiety-provoking event compared to recollection of a neutral event. Trait anxiety was not related to food intake among normal weight individuals, suggesting there may be an important interaction between anxiety, weight status, and emotional eating.

**Emotional Eating and Weight Loss**

In addition to its association with an elevated weight status, emotional eating has been identified as a barrier to weight loss and weight loss maintenance for both surgical and nonsurgical weight loss patients (Canetti, Berry, & Elizur, 2009; Kayman, Bruvold, & Stren, 1990; Rusch, Andris, & Wallace, 2009). Kayman and colleagues (1990) evaluated a sample of women
who had successfully lost weight through behavior modification. Women who had successfully maintained their weight loss were compared with those who had regained weight. They found that 70% of those who had regained weight reported eating in response to emotions. Similarly, Canetti and colleagues (2009) created a 7-item scale to assess emotional eating in both behavioral and surgical weight loss patients. The scale assessed whether eating provided comfort to the participants and whether they ate in response to several negative emotions (i.e. nervousness, disappointment, anger). The researchers compared emotional eating scores to overall weight loss at one year following either participation in a weight-loss program or receipt of a surgical banding procedure and found that emotional eating was associated with poorer outcomes for participants in both weight loss groups. For surgical patients, baseline emotional eating predicted poorer weight-loss outcomes. For the non-surgical patients, those high in emotional eating experienced lower levels of weight loss, mental health improvement and, well-being and higher levels of psychological distress than those lower in emotional eating. The authors suggest that emotional eating is an important factor to consider for individuals who do not succeed, or are less successful, in standard weight loss programs.

In contrast to the aforementioned studies, one study found no relationship between baseline emotional eating status and weight loss among morbidly obese patients who underwent Roux-en-Y bypass (Fischer, 2007). The Emotional Eating Scale (EES, Arnow, Kenardy, & Agras, 1995) was used to divide patients into either a high or low emotional eating category for those scoring in the top and bottom quartiles respectively. High emotional eaters reported higher depressive symptomatology and higher rates of binge eating, extreme weight control behaviors, and eating in response to external cues at baseline. However, there were no significant differences in BMI between high and low emotional eaters at baseline or 8-month (on average)
follow-up. The differences in depression and external eating were no longer present at follow-up, suggesting that the Roux-en-Y procedure led to improvements in these domains. However, emotional eating was not assessed following surgery. While these results suggest that emotional eating may not be associated with negative outcomes following Roux-en-Y bypass among morbidly obese individuals, many surgical patients report improvements in weight and various quality of life domains within the first year of surgery (Sarwer, Wadden, & Fabricatore, 2005), and differences among patients tend to appear with extended follow-up (Shah, Simha, & Garg, 2006). The comparable weight loss between individuals high and low in emotional eating at eight months may be related to physiological limitations associated with the procedure.

The Roux-en-Y bypass involves physiological changes that significantly alter dietary behavior immediately following surgery. Following gastric bypass, the amount of food that can be contained within the stomach is drastically reduced to approximately three ounces and the consumption of foods high in fat and sugar results in malabsorption and dumping syndrome (Brolin, Robertson, Kenler, & Cody, 1994). Over time, individuals with the Roux-en-Y procedure can tolerate a wider variety of foods and can consume a larger amount of food if they do not closely adhere to the recommended post-surgical diet. If emotional eating is not adequately addressed prior to surgery, it may resume following the procedure and lead to weight regain over time. For example, a case study of one woman who underwent Roux-en-Y bypass indicated that she began to experience weight regain 36 months following surgery (Rusch & Andris, 2007). The reported weight gain was related to eating in response to a range of negative emotions regarding both her weight and life circumstances. Left untreated, emotional eating can resume following bariatric surgery in the form of unnecessary snacking and continual grazing (Rusch, Andris, & Wallace, 2009). Longer-term follow-ups are needed to determine the effects
of emotional eating on the more restrictive surgeries such as Rouex-en-Y bypass in comparison to less restrictive procedures such as the lap-band, which allows individuals to continue consuming foods high in fat and sugar so long as they are in liquid form. Sleeve gastrectomy is an increasingly popular bariatric procedure that alters anatomy to facilitate reduced food consumption without the extreme physiological consequences of fat and sugar consumption associated with the Roux-en-Y procedure (Gumbs, Gagner, Dakin, & Pomp, 2007), but there are currently no data available on the role of emotional eating among individuals who opt to receive this procedure.

**Emotional Eating and Eating Disorders**

In addition to its relationship with weight status and weight loss, emotional eating has been linked to aspects of eating disorders such as binge eating. There are notable similarities and differences between emotional eating and binge eating. Binge eating refers to the consumption of an unusually large amount of food accompanied by a sense of having lost control over eating (DSM-5, 2014). Binge eating may occur for a variety of reasons, including but not limited to negative affect. By comparison, emotional eating is not defined by the amount of food consumed, nor does it require an individual to experience loss of control. Individuals who engage in emotional eating may report eating a large amount of food, feel distressed about the amount of food they consumed, or indicate that they were unable to keep themselves from eating, but these features are not a requirement. By definition, emotional eating and binge eating are not mutually exclusive phenomena. Although the terms refer to different experiences, there may be some overlap between individuals who report binge eating and those who report emotional eating.

Eldredge and Agras (1996) evaluated individuals in various commercial weight loss programs meeting criteria for either binge eating disorder (BED) or an eating disorder not
otherwise specified (EDNOS). Weight loss patients with BED were more likely to eat in response to negative emotional states than low-weight EDNOS individuals or weight loss patients with no ED. However, there were no significant differences in emotional eating between individuals with BED and high-weight individuals with EDNOS. Weight was not related to emotional eating in individuals with BED or controls, but there was a difference by weight status for individuals with EDNOS, with high-weight EDNOS individuals reporting significantly greater levels of emotional eating than low-weight EDNOS individuals. These results indicate that emotional eating may occur at a higher rate among individuals with eating disorders marked by binge eating than among individuals without an eating disorder. Furthermore, the data suggest that emotional eating is not related to weight among individuals with BED.

Fischer and colleagues (2007) identified only a moderate overlap between emotional eating and binge eating in a population of morbidly obese individuals seeking gastric bypass surgery. Some individuals high in emotional eating reported more than two binge episodes per week, while others reported no binge eating. Only half of the study participants who met criteria for BED were in the high emotional eating group, indicating that binge eating and emotional eating are distinct constructs with moderate overlap. Loss of control over eating is another construct that overlaps with both binge eating and emotional eating. Even among individuals who do not express elevated concern over shape and weight, the experience of having lost control over one’s food intake can lead to distress and subsequent eating (Colles, 2008).

Studies evaluating the relationship between emotional eating and binge eating have focused primarily on obese or morbidly obese individuals. Although research indicates a link between emotional eating, binge eating, and elevated weight status, there are limited data on the relationship between these factors among normal weight or overweight individuals. Among
normal weight women, emotional eating scores may reflect concerns about eating and a
preoccupation with the relationship between eating and emotions rather than actual food intake
(Adriaanse, de Ridder, & Evers, 2011). However, Stice and colleagues (2002) have suggested
that an emotional eating intervention might lower the risk of binge eating onset among at-risk
youth, for whom binge eating is a risk factor for later development of obesity. Overall, data
indicate that emotional eating occurs in some individuals with BED, but is not exclusive to BED,
with emotional eating also being present in some overweight individuals meeting criteria for
EDNOS. Despite some overlap, the distinction between emotional eating and binge eating
suggests that emotional eating warrants its own attention in treatment research.

**Treatment of Emotional Eating**

Despite the prevalence and clinical significance of emotional eating, a review of the
literature reveals no treatment studies specifically targeting emotional eating. To the researcher’s
knowledge, there are no formal recommendations for the treatment of emotional eating in any
population (e.g., bariatric surgery patients, overweight, normal weight). Chesler (2012)
highlights the potential benefit of a Cognitive Behavioral Therapy (CBT)-based intervention for
emotional eating, citing three case studies with postoperative bariatric surgery patients that each
targeted a reduction in emotional eating. One treatment plan involved elements of cognitive
restructuring, pleasant activity scheduling, stimulus control, and scheduling snacks, but the
treatment’s impact on weight and eating behavior was not reported (Rusch & Andris, 2007).
Studies are needed that conduct baseline and follow-up assessments of emotional eating when
evaluating the impact of various therapeutic techniques on the behavior.

Other case studies have focused on addressing beliefs about emotional eating and its
impact on emotions, as well as negative reactions to dietary recommendations (Chesler, Harris,
& Oestreicher, 2009; Chesler, 2012). These interventions involved the development of coping and problem-solving skills and education about proper pre- and postsurgical diets and resulted in reduced emotional eating and stabilization of weight loss. Although these cases suggest that cognitive-behavioral strategies may be used to reduce emotional eating, they are not sufficient to serve as a formal treatment recommendation. The lack of a formal treatment protocol in the aforementioned case studies greatly limits their generalizability. More stringent research utilizing either a series of single-case designs or a randomized controlled trial is needed to determine the effect of CBT-based interventions on emotional eating.

An alternative to CBT as a treatment for emotional eating may be a mindfulness-based intervention (Katterman, Kleinman, Hood, Nackers, & Corsica, 2014). A review of several mindfulness-based interventions targeting weight loss and a range of problematic eating behaviors indicated such interventions had the ability to reduce emotional eating in women identified as problematic eaters (Alberts, Thewissen, & Raes, 2012) and overweight women who identified as “stress eaters” (Daubenmier et al., 2011), compared to control groups. These studies employed mindfulness interventions to target a range of variables that included weight, anxiety, external eating and emotional eating. Although emotional eating was not the primary target of these mindfulness-based interventions, the subsequent reduction in emotional eating suggests that mindfulness techniques might be appropriate for an intervention designed specifically to reduce emotional eating among those who find it distressing and indicate a desire to reduce such instances. One study utilized a combination of CBT and mindfulness-based stress reduction to target eating specifically in response to stress in overweight participants (Corisca, Hood, Katterman, Kleinman, & Ivan, 2014). The findings further support the use of mindfulness skills to address eating in response to a broader range of emotions. Furthermore, the combined CBT
and mindfulness-based intervention was more effective in reducing stress eating than either CBT or mindfulness alone.

In addition to CBT and mindfulness-based exercises, a review of the literature indicates additional strategies may be beneficial components of an intervention aimed at reducing emotional eating. Emotional eating may at times reflect a conscious behavioral decision intended to ease negative emotions or at other times may be an automatic, unconscious reaction to negative feelings among individuals who have difficulty identifying emotions. This second form of emotional eating is referred to as reflexive emotional eating and can be related to the inability to recognize physiological cues and emotions (Chesler, 2012). Individuals with both forms of emotional eating may benefit from psychoeducation regarding the adaptive function of emotions and the biological mechanisms that can lead to habit formation with regard to eating behavior. Without prior research examining a direct comparison of CBT and mindfulness-based approaches for emotional eating, a combination techniques drawn from a variety of cognitive and behaviorally based treatments may be warranted.

**Self-Help Interventions**

The World Health Organization (2003) estimates that between 44 and 70 percent of individuals with mental disorders do not receive treatment. The disparity between individuals needing services and those receiving them may be even more pronounced among those not meeting formal criteria for a mental health diagnosis. In the absence of a clinical diagnosis, many individuals are unable to obtain third party reimbursement for psychological services. Although there is some overlap between emotional eating and other psychological concerns (e.g., anxiety, binge eating), emotional eating is not exclusive to individuals with those clinical concerns. Individuals with emotional eating may be unable to receive insurance coverage to seek in-person
individual treatment for emotional eating in the absence of anxiety or a clinically diagnosable eating disorder. Similarly, medical health insurance plans offer little financial assistance for weight management, and not all individuals reporting difficulties with emotional eating are overweight or in need of weight management services. With approximately 40% of the population endorsing emotional eating, a self-help intervention may provide access to care for this large portion of individuals who may not otherwise receive treatment.

Self-help programs have been developed as financially feasible alternatives to professional, in-person treatment for a variety of concerns including obesity and binge eating (Latner 2001; Latner 2007; Butryn, Kerrigan, & Kelly, 2012, Carter & Fairburn, 1998). These interventions can help reduce the gap between the number of individuals needing services and those who receive them. Self-help interventions come in multiple forms including manuals, audio files, and group-based programs, and can include additional assistance ranging from full autonomy to structured contact with a group or individual provider. A stepped care approach has been recommended for patient populations that contain a range of severity (Bower & Gilbody, 2005). In a stepped care model, the first line of treatment is an inexpensive, self-help approach in which patients are provided with materials such as psychoeducational material, self-help books, or audiotapes. As a second step, patients who do not benefit from self-help alone could be enrolled in a self-help group. For those needing additional assistance, a third step could include interaction with a provider, with the fourth step involving regular, structured therapy with an individual provider.

Guided self-help offers an alternative to purely independent self-help in which an individual is provided with information in the form of a manual and is also given limited contact with a provider. Such interventions have also demonstrated efficacy in reducing problematic
dietary behaviors such as binge eating (Carter & Fairburn, 1998; Loeb, Wilson, Gilbert, & Labouvie, 2000). This approach might be an appropriate first-line intervention for emotional eating that could increase access to much-needed treatment by providing individuals with the means to address their eating behavior without the need for a formal diagnosis or the higher cost of in-person therapy.

**Internet-Based Interventions**

An alternative form of traditional self-help utilizes the Internet to deliver psychological interventions (Barak, Hen, Boniel-Nissm, & Shapira, 2008). Such programs are becoming increasingly prevalent with growing demand for widely available treatments and more widespread access to the Internet. Internet-based self-help programs can offer the same levels of care outlined in a stepped-care model, with group and therapist interaction taking place through chat-rooms, private email, or face-to-face video. Additionally, web-based interventions can offer a low or no-cost treatment option that may be preferable to the cost of seeking treatment from a licensed mental health or medical provider. Internet-based treatment programs have recently been recognized for their ability to reduce the disparity between individuals needing services and those receiving them, reducing cost, and increasing access to care (Kazdin & Blase, 2011). Such treatments also have the benefit of allowing the user to move through the program content at their own pace at a time and location that is most convenient to them. One study noted that the most common time of day for participant login on an online self-help program was between 8:00pm and 11:00pm (Carrard et al., 2011), suggesting that increased flexibility might expand the appeal of such an intervention to individuals who may lack the ability to seek treatment during typical office hours.
Online guided self-help programs have demonstrated efficacy in improving a range of psychological concerns, including bulimia nervosa (Nevonen, Mark, Levin, Lindstrom, & Paulson-Karlsson, 2006; Carrard et al., 2006), binge eating disorder (Carrard et al., 2011), panic disorder (Carlbring et al., 2005), social phobia (Carlbring, Gunnarsdottir, Hedensjo, Andersson, Akselius, & Furmark, 2007; Berger, Hohn, & Caspar, 2009), posttraumatic stress disorder (Litz, Williams, Wang, Bryant, & Engel, 2004; Litz, Engel, Bryant, & Papa, 2007), depression (Meyer et al., 2009; Vernmark et al., 2010), and alcohol use (Blankers, Koeter, & Schippers, 2011). A 6-month CBT-based self-help guide for bulimic pathology was successful in reducing several core symptoms of bulimia nervosa (e.g., vomiting, dietary restraint, and weight phobia), but did not lead to significant reductions in binge eating or exercise (Nevonen, Mark, Levin, Lindstrom, & Paulson-Karlsson, 2006). The authors suggest that the intervention may serve as a precursor to preparing individuals for in-person therapy and noted that web-based programs may be most effective for individuals with less severe psychopathology. This observation has been noted in another study of a web-based intervention for bulimia nervosa (BN), where severity predicted dropout (Carrard et al., 2006). Due to the partial crossover between individuals who report emotional eating and those who report binge eating, it would be useful to examine the utility of some aspects of CBT-based guided self-help for BED and BN for an emotional eating intervention.

In addition to CBT-based interventions, acceptance and mindfulness-based interventions have also been effectively delivered in an online self-help format for problems ranging from stress and sleep difficulties to depression (see Cavanagh, Strauss, Forder, & Jones, 2014 for a review). The majority of these CBT and mindfulness-based programs have utilized a guided self-help format to facilitate therapeutic gains by providing varying amounts of web-based contact.
with a therapist, and research has demonstrated that this inclusion of therapist contact bolsters the effects in some populations (Carrard et al., 2006; 2011). One research group developed an online CBT-based guided self-help programs for BN and BED that utilized weekly contact with a therapeutic “coach” via email (Carrard et al., 2006; 2011). Inclusion of these coaches provided an opportunity for participants to ask questions and also provided researchers with an opportunity to determine which aspects of the CBT-based treatment were more challenging for participants when delivered in a web-based format. Participants endorsed the positive role of the weekly therapist contact, with many indicating they would have been more inclined to drop out had they not received regular contact. For both the BN and BED patient groups, the coaches noted that participants often experienced difficulty with cognitive exercises such as cognitive restructuring, indicating that participants would become “stuck” on these sessions. Indeed, much of the dropout in these studies occurred around the weeks during which participants were introduced to these more challenging cognitive exercises, suggesting that alternative cognitive strategies may be more appropriate for an online format. One such alternative may be acceptance-based cognitive strategies, which have demonstrated ease and effectiveness in dissemination in a brief format (Forman, Hoffman, McGrath, Herbert, Brandsma, & Lowe, 2007). Acceptance, cognitive diffusion, and distress tolerance were taught to undergraduate students in a 30-minute group session as strategies to reduce food cravings. These acceptance-based strategies were more effective in reducing cravings than cognitive control and cognitive restructuring for individuals reporting greater susceptibility to the food environment. Although there has not been a direct comparison of CBT and acceptance-based cognitive strategies delivered via an online self-help intervention, the utility of these cognitive strategies when taught in a brief intervention suggests they may also be useful in an online format.
**Present Study**

Emotional eating has been identified as a barrier to weight loss across behavioral and surgical modalities. A treatment targeting emotional eating could address the growing concern over obesity-related health problems by removing a barrier among those attempting to lose weight. An effective treatment may also prevent weight gain from occurring among those who report emotional eating by reducing consumption of highly palatable foods in the absence of hunger, in response to negative affect. The present study aims to evaluate an online guided self-help treatment for the reduction of emotional eating among individuals who report eating in response to negative affect and a desire to reduce such episodes. The Reducing Emotional Eating (RedEE) Program contained a range of cognitive and behavioral coping and problem-solving techniques aimed at reducing both negative affect and hedonic eating in response to such affect. Following the methodology of earlier internet-based interventions for eating disorders, participants were given the opportunity to have limited weekly contact with a provider who was available to provide encouragement and support regarding any content with which the participant may need additional assistance. A waitlist control was used to evaluate the efficacy of the treatment over an initial 6-week period and a 12-week follow-up. Emotional eating, mood, loss of control over eating, and eating disorder pathology were evaluated, and it was hypothesized that self-reported emotional eating would be reduced following use of the online guided self-help program.

In sum, the main hypotheses were as follows:

1) At the 6-week assessment, emotional eating scores would be significantly lower among participants in the intervention condition than among waitlist participants.
2) At the 6-week assessment, negative affect and loss of control over eating would be significantly lower among participants in the intervention condition compared to those of waitlist participants.

3) The program would be utilized by the majority of participants and would yield retention rates comparable to other Internet-based self-help programs.

Methods

A power analysis was conducted to determine the necessary sample size prior to participant recruitment. Studies measuring changes in emotional eating using the DEBQ have reported within-group effect sizes ranging from 0.54 (Alberts et al., 2011) to 0.94 (Daubenmier et al., 2011) and between-group effect sizes between 0.53 (Alberts et al., 2012) and 0.57 (Daubenmier et al., 2011). Using an alpha level of .05 and a medium effect size of 0.6, it was determined that 40 total participants would be needed to achieve the necessary power for the main analyses. Studies of online self-help interventions have attrition rates ranging from 17.6% over six months (Carrard et al., 2011) to 36% over four months (Carrard et al., 2006). In general, studies with longer intervention and follow-up periods and those treating more severe psychopathology have had higher rates of attrition. The present intervention and study period was shorter than most studies of online self-help interventions and addressed a construct less severe than the aforementioned studies. Therefore, an attrition rate of 20% was estimated for the present study, which resulted in a target of 25 participants per intervention condition.

Participants

Participants (N=59) consisted of undergraduate students from the University of Hawaii at Manoa. Two waves of participants were recruited, one in the Spring 2015 semester (n=31) and one in the Fall 2015 semester (n=28). Men and women over the age of 18 were eligible to
participate in the study if they a) reported increasing food intake in response to stress or distressing emotions b) indicated a desire to reduce such episodes of emotional eating and learn emotional management strategies c) were not currently pregnant or breast feeding and d) were not currently seeking treatment for emotional eating from a mental health provider.

Procedure

Baseline Assessment. Undergraduates who endorsed a desire to reduce episodes of emotional eating were invited to an in-person assessment. At the baseline assessment, described below, individuals were given a verbal and written description of the study. All individuals who wished to participate were screened for eligibility and eligible participants completed the baseline questionnaire packet. Each participant’s height and weight was measured by the assessor after the baseline questionnaire was completed.

Following completion of the baseline questionnaire packet, participants were randomly assigned to either the intervention or waitlist condition. Participants in the intervention condition were shown how to use the online program and created an account using their unique user ID, giving them immediate access to the intervention. Participants in the waitlist condition were given the opportunity to access the intervention website following the 12-week assessment.

Follow-up Assessments. All participants were sent a link to an online follow-up questionnaire six and twelve weeks following their baseline assessment. The 6-week assessment was considered the post-intervention assessment for participants in the intervention condition and the 12-week assessment was considered the follow-up assessment.

Intervention. The emotional eating intervention contained a series of modules targeting both cognitive and behavioral aspects of emotional eating. The content of the intervention was developed using treatment elements from CBT and mindfulness-based interventions for eating
disorders and weight management, as well as elements specific to emotional eating, developed by the investigator, based on the emotional eating literature (Wagner, Ahlstrom, Redden, Vickers, & Mann, 2014). The first module introduces participants to a common pathway for emotional eating. The subsequent modules introduce skills and strategies to address emotional eating. Each skill is linked to a particular location on the common pathway, highlighting when a particular skill might be most useful. Skills and strategies introduced within the modules include: normalizing eating, identifying emotions, progressive muscle relaxation, generating a list of alternative activities, urge surfing, mindfulness, distress tolerance, acting in accordance with the opposite emotion, problem-solving, and pleasant activity scheduling. Table 1 contains an outline of the modules and brief description of module content. Each module included at least one suggested exercise for participants to use in order to practice the cognitive or behavioral skills introduced within the module. Two undergraduate research assistants were asked to complete the intervention and provide feedback on the content and use of the website prior to delivery to participants.

Table 1. Outline and brief description of module content

<table>
<thead>
<tr>
<th>Module Content</th>
<th>General Description of Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction to the Program</td>
<td>Participants were presented with information on emotional eating including psychological and biological explanations for the phenomenon.</td>
</tr>
<tr>
<td>What is emotional eating and why does it occur?</td>
<td>A review of the content and goals of the program was presented along with guidelines for use of the program.</td>
</tr>
<tr>
<td>Description and goals of the program</td>
<td>Normalizing Eating</td>
</tr>
<tr>
<td>Strategies to normalize eating</td>
<td>Participants were introduced to several strategies aimed at normalizing eating such as designating locations for meals, reducing multitasking while eating, and meal planning.</td>
</tr>
<tr>
<td></td>
<td>Psychoeducation on Emotions</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------</td>
</tr>
<tr>
<td></td>
<td><em>Exploring the role of emotions</em></td>
</tr>
<tr>
<td></td>
<td><em>Identifying and accepting your own negative emotions</em></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Behavioral Coping Skills and Strategies Part I</td>
</tr>
<tr>
<td></td>
<td><em>Progressive Muscle Relaxation</em></td>
</tr>
<tr>
<td></td>
<td><em>Alternative Behaviors</em></td>
</tr>
<tr>
<td></td>
<td>4 Cognitive Coping Skills and Strategies</td>
</tr>
<tr>
<td></td>
<td><em>Urge Surfing</em></td>
</tr>
<tr>
<td></td>
<td><em>Mindfulness</em></td>
</tr>
<tr>
<td></td>
<td>5 Behavioral Coping Skills and Strategies Part II</td>
</tr>
<tr>
<td></td>
<td><em>Doing the Opposite</em></td>
</tr>
<tr>
<td></td>
<td><em>Problem Solving</em></td>
</tr>
<tr>
<td></td>
<td><em>Pleasant activity scheduling</em></td>
</tr>
<tr>
<td></td>
<td>6 Long-Term Management of Emotional Eating</td>
</tr>
<tr>
<td></td>
<td><em>Program review</em></td>
</tr>
</tbody>
</table>
Access to the modules was provided to participants at scheduled intervals during the six week intervention period and participants were encouraged to work through the modules in the order in which they were presented. Immediate access was given to the first two modules. After two weeks, participants were able to access modules one through four. After four weeks, participants were given access to all six modules. It was recommended that participants spend one week on each of the modules. Participants were not given a deadline to complete the program, but individuals in the intervention condition were informed the 6-week assessment would evaluate the effects of the program and were encouraged to complete all of the modules by the 6-week assessment.

Each intervention module contained written material that could be accessed only while logged in to the program website. Supplemental materials included within the modules included an audio recording of the progressive muscle relaxation exercise and three charts that helped participants identify emotions and review their purpose which could be downloaded. The modules contained prompts that encouraged participants to think about how they might apply various skills or principles introduced. At the end of each module was an overview of the major concepts and suggested exercises to practice the skills in that module. Participants were also given access to an online journal within the program website. Each intervention module had a corresponding journal for participants to take notes and record their suggested exercises.

In order to encourage regular use of the online program, monitor progress, and offer any additional assistance with the program content, the investigator sent a weekly email to participants during the intervention phase. The weekly email contained a brief message indicating which week of the study they were in and providing a brief description of that week’s module. The email encouraged participants to continue utilizing the program and engaging in the
suggested exercises. Participants were not required to respond to the investigator email, but were encouraged to do so if they had questions or desired additional assistance with the material.

Measures

Screening Questions. At the baseline assessment, participants were asked how often they eat in response to stress or negative/distressing emotions. Two questions regarding frequency were asked. The first, “How often do you eat in response stress or other negative/distressing emotions?”, was rated on a 5-point Likert scale with response options ranging from Never to Always. The second question asked how many times per week, on average, participants eat in response to stress or other distressing emotions. Response options for this question included: 0, 1-3, 4-7, 8-11, 13-15, 17-19, and 20+. Participants were also asked if they would like to reduce the frequency of their emotional eating episodes with a dichotomous Yes/No response option. Those indicating they “rarely”, “sometimes”, “often”, or “always” eat in response to a stressor and those reporting at least 1 episode of emotional eating per week, on average, qualified for participation if they were interested in reducing the frequency of such episodes. One emotional eating episode per week was set as the minimum frequency to allow participants enough opportunity to practice the strategies introduced during the 6-week intervention period.

Eating Behavior. The Emotional Eating Scale (EES; Arnow, Kenardy, & Agras, 1995) was used to evaluate emotional eating. The EES is a 25-item scale that asks participants to indicate how strongly they experience an urge to eat when experiencing various emotions (e.g., resentful, confused, bored). The measure contains subscales for anger/frustration, anxiety, and depression. Items are rated on a 5-point Likert scale with response options ranging from no desire to eat (1) to an overwhelming urge to eat (5). Internal consistency (alpha) values range
from .72 to .78. The EES has demonstrated good convergent and discriminate validity, adequate two-week test-retest reliability ($r = .79$), and sensitivity to change following treatment for binge eating and/or weight loss (see Arnow, Kenardy, & Agras, 1995 for a review of treatment studies). Internal consistency values in the present sample were .76, .81, and .85 for the anxiety, depression, and anger/frustration subscales, respectively.

The 23-items from the emotional and external eating subscales of the Dutch Eating Behavior Questionnaire (DEBQ; van Strien, Frijters, Bergers, & Defares, 1986) were used as an additional measure of emotional eating. The two subscales contain 22 items that are endorsed on a 5-point Likert scale with responses ranging from *Never* (1) to *Always* (5). The emotional eating subscale contains 13 items (e.g., "Do you have a desire to eat when you are feeling lonely?") that evaluate the impact of emotional factors on eating behavior. Several emotions in the emotional eating subscale of the DEBQ differ from those in the EES. Additionally, while the EES measures the strength of the urge to eat, the DEBQ assesses frequency. The external eating subscale contains 9 items that evaluate the impact of an individual's external environment on their eating behavior (e.g., "Do you eat more than usual when you see others eating?"). The DEBQ has demonstrated high internal consistency in both normal weight and obese populations. Cronbach’s alpha values for the emotional eating subscale range from .94 among normal weight individuals to .95 among obese individuals. Internal consistency for the external eating subscale ranges from .80 in normal weight individuals to .83 among obese individuals (van Strien, Frijters, Bergers, & Defares, 1986). The measure can be used to identify eating patterns of normal and overweight individuals, as well as those with bulimia nervosa and anorexia nervosa (Wardle, 1987). Internal consistency in the present sample was .90 for the emotional eating subscale and .79 for the external eating subscale.
The Loss of Control Over Eating Scale (LOCES; Latner, Mond, Kelly, Haynes, & Hay, 2014) was used to assess the subjective experience of losing control over one's eating behavior. The 24-item scale asks individuals to rate how often they experienced various feelings while eating over the past 4 weeks. Items (e.g., I kept eating even though I was no longer hungry) are rated for frequency on a 5-point Likert scale ranging from *Never (1)* to *Always (5)*. The LOCES consists of the full scale and three subscales assessing the behavioral, cognitive/dissociative, and positive/euphoric components of loss of control. The behavioral subscale consists of items that describe the physical component of losing control over eating (e.g., “I kept eating even though I was no longer hungry.”) The cognitive/dissociative subscale contains statements such as “I could not concentrate on anything other than eating,” and the positive/euphoric subscale contains items such as “While eating, I feel a physical rush or high.”

The LOCES has demonstrated high internal consistency (.96) and test-retest reliability (r=.86) over a 2-4 week period. The measure has good content, convergent, and discriminate and validity among undergraduate students at the University of Hawaii at Manoa. Internal consistency in the present sample was .94.

**Mood.** Mood was assessed using the expanded form of the Positive and Negative Affect Scale (PANAS-X; Watson & Clark, 1991). The measure contains 60 items and asks participants to indicate the extent to which they have experienced various positive (e.g., attentive, inspired) and negative (e.g., distressed, hostile) emotions over the past week. The extended version was selected in order to capture a broad range of affect that can lead to emotional eating. The scale contains 11 subscales, two for the higher-order positive and negative affect, as well as lower-order scales for fear, hostility, guilt, sadness, joviality, self-assurance, attentiveness, shyness, fatigue, serenity, and surprise. Each emotion is rated on a 5-point Likert scale ranging from *Very
slightly or not at all (1) to Extremely (5).

The PANAS-X has demonstrated reliability and validity among a range of populations, including undergraduate students (Watson & Clark, 1991; Watson & Clark, 1999; Ready et al., 2011; Howell, Rozdon, Kurai, & Sanchez, 2010). The subscales have strong internal consistency with values ranging from 0.83 to 0.90 for the broader positive and negative affect subscales. The specific negative affect subscales have internal consistency values ranging from 0.79 to 0.92 and the specific positive affect subscales range from 0.70 to 0.93. The attentiveness scale has the lowest internal consistency and contains the fewest individual components. The measure has also demonstrated strong convergent validity with alternative measures of positive (0.93-0.89) and negative affect (0.89) and good discriminant validity (-0.16 to -0.23). Among college students, two-month test-retest values have ranged from 0.51 for the serenity subscale to 0.71 for the general negative affect subscale. Internal consistency in the present sample was .80 for the general negative subscale and .90 for the general positive subscale.

**Psychopathology.** The Patient Health Questionnaire (PRIME-MD PHQ; Spitzer, Kroenke, & Williams, 1999) was used to assess general psychopathology at the baseline assessment. The PHQ is a self-report measure developed for use in primary care medical settings. It contains categories for mood, anxiety, and somatoform disorders, as well as eating disorders and alcohol abuse, and can be used to identify probable threshold and subthreshold disorders. The mood, anxiety, and alcohol abuse categories were used to identify participants with probable psychopathology. The PHQ has demonstrated validity, with good agreement between the measure and independent mental health professionals (kappa=0.65; Spitzer et al., 1999). There are limited data on the measure’s test-retest reliability. A one-week retest interval was used for patients who initially presented at a primary care office, unable to work due to illness. Kappa
values ranged from fair to moderate for anxiety (0.32) and mood disorders (0.47), to good for alcohol use disorders (0.69; Bakker, Terluin, van Marwijk, van Mechelen, & Stalman, 2009).

The Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000) was used to assess disordered eating. The EDDS is a 22-item measure that can be used to diagnose anorexia nervosa, bulimia nervosa, and binge eating disorder, based on the DSM-IV criteria (APA, 1994). The EDDS has demonstrated good to excellent criterion validity, showing diagnostic agreement with structured interviews ranging from 93% among individuals with binge eating disorder to 99% among those with anorexia nervosa (Stice, Telch, & Rizvi, 2000). The measure has demonstrated good internal consistency (.89), test-retest reliability (r=.87), and sensitivity to intervention in both clinical and research populations (Stice, Fisher, & Martinez, 2004).

**Additional Variables.** Participants provided demographic information including age, gender, and ethnicity at baseline. Self-report height and weight were collected at all assessments, and actual height and weight were recorded at the baseline assessment. Participants reported current medication usage at the baseline assessment and were asked to report any medication changes at subsequent sessions to identify if any changes in medication that occurred could have impacted mood. Following use of the online program, participants in the intervention group were asked to complete measures of program use, acceptability, and perceived helpfulness. They rated the perceived helpfulness of the overall program, as well as individual elements of the program, and were asked whether they would recommend the program to someone else.

Participants were given the opportunity to provide written feedback on the RedEE Program at the 6-week and 12-week assessments. Following the first wave of 12-week assessments, three participants in the intervention condition were randomly selected to participate in a discussion with the investigator in order to provide additional feedback. One
participant did not respond to the invitation. Of the two participants who did respond, neither was available to identify a time to meet with the investigator. Therefore, specific feedback about the program content and structure was unable to be obtained in an interactive format.

Results

Sixty individuals signed up for the present study, indicating they engaged in emotional eating (as defined earlier) and were interested in learning how to reduce their emotional eating. One participant reported significant concern over her eating and was referred to an outpatient eating disorder treatment program during the first six weeks of the study. This participant was removed from data analysis. Of the 59 remaining participants, six (10.2%) were male and fifty-three (89.8%) were female. The majority of participants reported their primary ethnicity as Asian (66.1%) and were in their first two years of undergraduate study. Participant age ranged from 18 to 35 (M=20.14, SD=3.17) and mean body mass index was in the normal range (M=24.09, SD=4.9). Demographic information is reported in Table 2.

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>22 (40.0%)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>19 (34.5%)</td>
</tr>
<tr>
<td>Junior</td>
<td>11 (20.0%)</td>
</tr>
<tr>
<td>Senior</td>
<td>3 (5.4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>39 (66.1%)</td>
</tr>
<tr>
<td>Caucasian</td>
<td>12 (20.3%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2 (3.4%)</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>2 (3.4%)</td>
</tr>
<tr>
<td>African American</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td>Multiracial</td>
<td>3 (5.1%)</td>
</tr>
</tbody>
</table>

Data were checked for normal distribution. The cognitive and positive subscales of the LOCES and the guilt and hostility subscales of the PANAS-X were skewed. A square root
transformation was used for the guilt and hostility subscales of the PANAS-X and the positive subscale of the LOCES. A log transformation was used for the cognitive subscale of the LOCES. A missing data analysis revealed that data were missing completely at random. Therefore, listwise deletion was utilized in all subsequent analyses.

**Baseline Analyses**

At the baseline assessment, participants were asked to report how emotional eating was problematic for them. Participants were given a range of responses and were asked to select all that applied to them. The majority of participants selected more than one and the most commonly reported problem was eating unhealthy foods during an emotional eating episode. Table 3 contains the frequency of reported problems associated with emotional eating.

<table>
<thead>
<tr>
<th>Problem Description</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It leads me to eat unhealthy foods</td>
<td>54 (91.5%)</td>
</tr>
<tr>
<td>It causes me to gain weight</td>
<td>41 (69.5%)</td>
</tr>
<tr>
<td>It is a habit I would like to gain more control over</td>
<td>40 (67.8%)</td>
</tr>
<tr>
<td>I feel guilty after engaging in emotional eating</td>
<td>38 (64.4%)</td>
</tr>
<tr>
<td>It prevents me from losing weight</td>
<td>29 (49.2%)</td>
</tr>
<tr>
<td>I feel out of control when I emotionally eat</td>
<td>23 (39.0%)</td>
</tr>
</tbody>
</table>

The PHQ was used to identify participants meeting criteria for a probable diagnosis of major depressive disorder (n=9), depressive disorder not otherwise specified (NOS; n=7), panic disorder (n=4), anxiety disorder not otherwise specified (n=7), and alcohol abuse (n=6) at the baseline assessment. Overall, twenty-two participants (37.3%) endorsed psychopathology that did not include problematic eating behaviors. The EDDS was used to identify participants who met criteria for a probable eating disorder. Forty-six percent of participants (n=27) endorsed criteria for binge eating. Of these, twelve met criteria for binge eating disorder and fifteen met criteria for an unspecified eating disorder, according to the EDDS. The majority of participants
with an unspecified eating disorder on the EDDS (n = 12) reported fasting and/or excessive exercise as their compensatory behavior, and two reported using both laxatives and self-induced vomiting for weight control. A total of thirty-eight participants (64.4%) endorsed some form of clinical or subclinical psychopathology.

32 participants were randomly assigned to the intervention condition and 27 were assigned to the waitlist condition. Chi-square tests (Table 4) revealed no significant differences in the number of participants endorsing the psychopathology above in the intervention and waitlist conditions. Additionally, an independent-samples t-test indicated no significant differences in continuous baseline scores on the depression subscale of the PHQ (PHQ-9; t (1,55) = .52, p = .61). Independent-samples t-tests indicated there were no significant baseline differences in age (t (1, 56) = -.35, p = .73) or BMI (t (1,57) = -.56, p = .58) between conditions. Similarly, there were no significant baseline differences between the intervention and waitlist condition for the measures of emotional eating, loss of control, or affect. Figure 1 contains the number of participants in each condition who completed the baseline, 6-week, and 12-week assessments.

Table 4. Frequency of possible psychopathology based on self-report measures

<table>
<thead>
<tr>
<th>Possible diagnosis</th>
<th>Intervention n (%)</th>
<th>Waitlist n (%)</th>
<th>Chi-square</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Depressive Disorder</td>
<td>6 (23.1%)</td>
<td>3 (12.5%)</td>
<td>0.66</td>
<td>0.42</td>
</tr>
<tr>
<td>Depressive Disorder NOS</td>
<td>2 (7.7%)</td>
<td>5 (20.8%)</td>
<td>2.11</td>
<td>0.15</td>
</tr>
<tr>
<td>Panic Disorder</td>
<td>3 (11.5%)</td>
<td>1 (4.2%)</td>
<td>0.75</td>
<td>0.39</td>
</tr>
<tr>
<td>Anxiety</td>
<td>4 (15.4%)</td>
<td>3 (12.5%)</td>
<td>0.03</td>
<td>0.87</td>
</tr>
<tr>
<td>Alcohol Abuse</td>
<td>3 (11.5%)</td>
<td>3 (12.5%)</td>
<td>0.05</td>
<td>0.83</td>
</tr>
<tr>
<td>Binge Eating Disorder</td>
<td>6 (23.1%)</td>
<td>6 (25.0%)</td>
<td>0.11</td>
<td>0.74</td>
</tr>
<tr>
<td>Other Eating Disorder</td>
<td>5 (19.2%)</td>
<td>10 (41.7%)</td>
<td>3.54</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Primary Analyses

In order to evaluate hypotheses 1 and 2, a series of repeated-measures analysis of variance (ANOVAs) and subsequent one-way ANOVAs and paired-samples t-tests were used to evaluate within and between-group changes in emotional eating, loss of control over eating, and affect between the baseline and 6-week assessment. In order to accurately capture the effect of the intervention, participants in the intervention group were excluded from the analyses if they did not complete at least one of the RedEE modules. Module completion was assessed through self-report and confirmed through data from the program website. Two participants in the waitlist condition reported seeking psychological services for anxiety or mood concerns between
the baseline and 6-week assessment. Data were analyzed with and without these participants with no significant differences in results. Therefore, the two participants who sought psychological services were included in the analyses below. The results below compare participants in the waitlist condition to participants in the intervention condition who completed at least one RedEE module. Table 5 contains pre- and post-intervention values for all independent variables with significant within- and between-group differences noted.

**Emotional eating.** A repeated-measures ANOVA revealed a significant effect of time \((F(1,1)=7.70, p=.01)\) and condition \((F(1,44)=5.49, p=.02)\) on the depression subscale of the EES. The time x condition interaction was trending towards significance \((F(1,1)=3.80, p=.058)\). A one-way ANOVA revealed a significant difference between the intervention and waitlist groups at the 6-week assessment \((F(1, 44)=9.82, p=.003)\), with the intervention group reporting a lesser desire to eat in response to emotions related to depression.

For the anxiety subscale of the EES, the repeated-measures ANOVA revealed a significant condition effect \((F(1, 44)=4.27, p=.05)\), but no significant time or interaction effect. A one-way ANOVA revealed a significant difference between the intervention and waitlist groups at the 6-week assessment, with the intervention group reporting a significantly lower urge or desire to eat in response to emotions related to anxiety. However, there was no significant change in anxiety subscale scores between the baseline and 6-week assessments for participants in the intervention condition. There were no significant time, condition, or interaction effects for the anger/frustration subscale of the EES.

A repeated-measures ANOVA revealed a significant effect of time \((F(1,1)=9.13, p=.004)\) and condition \((F(1, 44)=4.86, p=.03)\) on the emotional eating subscale of the DEBQ. There was no significant interaction effect. A one-way ANOVA revealed a significant
Table 5: Means for intervention and waitlist conditions at baseline and 6-week assessment

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th></th>
<th>6-week</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention M (SD)</td>
<td>Waitlist M (SD)</td>
<td>Intervention M (SD)</td>
<td>Waitlist M (SD)</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
<td>15.59 (5.24)</td>
<td>17.21 (4.27)</td>
<td>12.73 (4.12)&lt;sup&gt;c&lt;/sup&gt;&lt;sup&gt;2&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Anxiety</td>
<td>18.82 (6.00)</td>
<td>20.96 (5.53)</td>
<td>16.41 (5.92)&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Anger/Frustration</td>
<td>24.18 (8.69)</td>
<td>26.88 (7.55)</td>
<td>21.55 (5.72)</td>
</tr>
<tr>
<td></td>
<td>EES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional</td>
<td>2.80 (0.77)</td>
<td>3.08 (0.77)</td>
<td>2.31 (0.63)&lt;sup&gt;b&lt;/sup&gt;&lt;sup&gt;3&lt;/sup&gt;</td>
<td>2.84 (0.79)</td>
</tr>
<tr>
<td>External</td>
<td>3.60 (0.53)</td>
<td>3.70 (0.61)</td>
<td>3.07 (0.65)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.36 (0.61)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>LOCES</td>
<td>2.66 (0.71)</td>
<td>2.74 (0.73)</td>
<td>1.92 (0.41)&lt;sup&gt;b&lt;/sup&gt;&lt;sup&gt;2&lt;/sup&gt;</td>
<td>2.43 (0.66)&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>Behavioral</td>
<td>3.26 (0.84)</td>
<td>3.30 (0.82)</td>
<td>2.29 (0.54)&lt;sup&gt;a&lt;/sup&gt;&lt;sup&gt;2&lt;/sup&gt;</td>
<td>2.84 (0.69)&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Positive</td>
<td>0.17 (0.15)</td>
<td>0.22 (0.18)</td>
<td>0.15 (0.15)</td>
<td>0.22 (0.15)</td>
</tr>
<tr>
<td>Positive</td>
<td>1.50 (0.29)</td>
<td>1.51 (0.38)</td>
<td>1.34 (0.25)&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.49 (0.39)</td>
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<td>PANAS-X</td>
<td>Negative</td>
<td>21.67 (7.40)</td>
<td>23.87 (5.33)</td>
<td>18.90 (5.64)&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Positive</td>
<td>28.41 (9.54)</td>
<td>27.05 (6.22)</td>
<td>28.41 (7.14)</td>
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<td></td>
<td>Guilt&lt;sup&gt;+&lt;/sup&gt;</td>
<td>3.50 (0.77)</td>
<td>3.93 (0.62)</td>
<td>3.26 (0.61)&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
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<td></td>
<td>Fear</td>
<td>11.86 (4.54)</td>
<td>12.30 (2.98)</td>
<td>10.67 (3.73)</td>
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<tr>
<td></td>
<td>Hostility&lt;sup&gt;+&lt;/sup&gt;</td>
<td>3.37 (0.58)</td>
<td>3.60 (0.55)</td>
<td>3.36 (0.49)</td>
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<td>Sadness</td>
<td>13.23 (4.96)</td>
<td>12.96 (4.14)</td>
<td>11.55 (5.17)</td>
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<td>Shyness</td>
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<td>Fatigue</td>
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<td>14.26 (3.68)</td>
<td>11.82 (3.73)</td>
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<td>Joviality</td>
<td>22.95 (7.11)</td>
<td>23.61 (4.55)</td>
<td>24.10 (8.59)</td>
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<td>Self-Assurance</td>
<td>13.59 (4.74)</td>
<td>12.59 (4.76)</td>
<td>14.36 (3.92)</td>
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<td>Attentiveness</td>
<td>12.67 (3.79)</td>
<td>12.09 (2.64)</td>
<td>11.57 (2.62)</td>
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<td>Serenity</td>
<td>8.52 (2.46)</td>
<td>7.48 (2.45)</td>
<td>8.05 (2.75)</td>
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<td>Surprise</td>
<td>6.33 (2.39)</td>
<td>5.57 (1.78)</td>
<td>6.81 (2.50)</td>
</tr>
</tbody>
</table>

<sup>+</sup> square root values  ++ log values

Time effect: Difference between baseline and 6-week  <sup>a</sup><i>p</i> < 0.001.  <sup>b</sup><i>p</i> < 0.01.  <sup>c</sup><i>p</i> < 0.05.

Condition effect: Difference between intervention and waitlist  <sup>1</sup><i>p</i> < 0.001.  <sup>2</sup><i>p</i> < 0.01.  <sup>3</sup><i>p</i> < 0.05.
difference between the intervention and waitlist conditions at the 6-week assessment (F(1,44) = 6.17, p=.02), with participants in the intervention condition reporting a less frequent desire to eat in response to distressing emotions. The repeated-measures ANOVA for the external subscale of the DEBQ revealed a significant effect of time (F(1,1)=20.75, p<0.001), but no significant condition or interaction effect. Participants in both groups showed a decrease in external eating at the 6-week assessment.

**Loss of control.** The repeated-measures ANOVA revealed a significant effect of time (F(1, 1)=26.95, p<.001) and a significant interaction effect (F(1, 1)=4.45, p=.04) on the LOCES. There was no significant effect of condition. The one-way ANOVA revealed a significance difference between the intervention and waitlist conditions at the 6-week assessment (F(1,38)=7.88, p=0.01), with the intervention group reporting lower loss of control over eating.

There was a significant effect of time (F(1, 1)=31.06, p<.001) for the behavioral subscale of the LOCES. There was no significant effect of condition and the interaction was trending towards significance (F(1,1)=3.83, p=.057). A one-way ANOVA revealed a significant difference on the behavioral subscale between the intervention and waitlist conditions at the 6-week assessment (F(1,40)=7.94, p=0.01) with intervention participants reporting lower levels of the behavioral component of loss of control. There were no significant time, condition, or interaction effects on the cognitive or positive subscales of the LOCES.

**Affect.** A repeated-measures ANOVA revealed no significant time or interaction effect for negative effect. There was a significant condition effect (F(1, 42)=4.32, p=0.04) and a one-way ANOVA revealed a significant difference between the intervention and waitlist groups at the 6-week assessment (F(1, 43)=5.76, p=0.02), with the intervention group reporting lower levels of negative affect at the 6-week assessment. There was a significant condition effect for
the guilt subscale ($F(1,41)=7.18, p=.01$). A one-way ANOVA revealed a significant difference between the intervention and waitlist conditions at the 6-week assessment, with the participants in the intervention condition reporting a lower level of guilt ($F(1, 44)=5.53, p=.02$).

The repeated-measures ANOVA for the attentiveness subscale of the PANAS-X revealed a significant effect of time ($F(1,1)=10.08, p=.003$), but no effect of condition or interaction effect. Participants in the waitlist condition reported lower levels of attentiveness at the 6-week assessment compared to baseline, but there was no significant difference between the two groups at the 6-week assessment. There were no significant time, condition, or interaction effects for positive affect, or the fear, hostility, sadness, shyness, fatigue, joviality, self-assurance, serenity, or surprise subscales.

**Secondary Analyses**

In order to evaluate the stability of post-intervention changes, a second series of repeated-measures and one-way ANOVAs were run to include the 12-week assessment.

**Emotional eating.** A repeated-measures ANOVA revealed a significant effect of time ($F(1,36)=5.33, p=.01$) and condition ($F(1,36)=4.26, p=.04$), but no significant interaction on the depression subscale of the EES. The time and interaction effect of the anxiety subscale remained non-significant, and condition effect of the anxiety subscale was no longer significant at the 12-week assessment. There continued to be no significant time, condition, or interaction effect for the anger/frustration subscale.

There was a significant effect of time ($F(1, 2)=7.06, p=.002$), but no significant effect of condition or interaction effect for the emotional eating subscale of the DEBQ. Similarly, there was a significant effect of time ($F(1,2)=18.70, p<0.001$), and no significant effect of condition or interaction effect for the external eating subscale of the DEBQ. However, a series of one-way
ANOVA revealed a significant difference between the intervention and waitlist conditions at the 12-week assessment, with participants in the intervention group reporting a lower desire to eat in response to external cues (F(1, 39)=4.47, p=.04).

**Loss of control.** The repeated-measures ANOVA revealed a significant effect of time (F(1,2)=7.57, p=.001), but no significant effect of condition or interaction effect for the full LOCES. The behavioral subscale of the LOCES revealed a similar pattern of results to the full measure with a significant effect of time (F(1,2)=13.26, p<0.001) and no significant interaction effect. The condition effect was trending towards significance (F(1, 34)=4.06, p=.052). There continued to be no significant time, condition, or interaction effect for the cognitive or positive subscales.

**Affect.** The repeated-measures ANOVA revealed no significant time, condition, or interaction effects for any of the affect subscales.

**Utilization and Acceptability**

Of the 32 participants in the intervention condition, 26 (81%) logged in to the RedEE Program at least once. Of those who logged in to the program, 22 completed at least one module and 16 completed at least half of the RedEE Program. Therefore, of the 32 participants assigned to the intervention condition, 68.8% completed at least one module of the RedEE program, 50% completed at least half of the intervention, and 36% completed the full intervention. Table 6 contains the frequencies for individual and total module completion. The amount of time spent on the RedEE program, based on participant self-report, ranged from one to thirty hours (M=6.07, SD=6.39).
The majority of participants who logged in to the RedEE program did not complete all six modules. Seventeen participants reported their reason for non-completion at the 6-week assessment. Reasons for non-completion ranged from forgetfulness to needing more time, and are outlined in Figure 1. The two participants who indicated they needed more time to complete the intervention suggested two to three additional weeks were needed. Four participants reported other reasons for not completing the program that included difficulty accessing the program, having other responsibilities that took priority, and developing significant problems with emotional difficulties. These reasons are outlined in Appendix E.

**Perceived Helpfulness**

Participants were asked to rate how helpful they found each of the skills presented throughout the RedEE program. The total number of participants completing each module...
decreased as participants progressed through the six weeks of the study, limiting the number of participants exposed to the skills in the later modules. Table 7 contains the frequency of perceived helpfulness for each of the skills at the 6-week assessment. Every skill was rated as helpful by at least one participant. The skills rated as either ‘helpful’ or ‘very helpful’ by the majority of participants who tried them were eating regularly spaced meals, establishing “eating zones,” reducing multitasking while eating, reviewing how emotions can be helpful, mindful eating, practicing mindfulness, problem solving, and scheduling pleasant activities. Contacting the researcher for additional assistance was not a skill, but a tool offered to participants during the course of the study. Only one participant contacted the researcher during the study period, but they requested logistical assistance with the website rather than assistance with program content or emotional eating.

Satisfaction

Nine participants (40.9%) reported being either satisfied or very satisfied with the RedEE Program as a whole. Fifteen participants (68.2%) reported being somewhat satisfied, satisfied, or very satisfied with the RedEE program. Five participants were neutral (22.7%), one was somewhat dissatisfied (4.5%), and one was dissatisfied (4.5%). Twenty participants (90.9%) indicated they would recommend the program to others.

Participants were given the opportunity to provide open-ended feedback at the 6-week and 12-week assessment. Eight participants provided feedback at the 6-week assessment, all of which was positive. Four participants directly stated their appreciation, two commented on specific aspects of the program they appreciated (e.g., journals, tips, and specific skills), and two described how the program has helped them. One participant provided a suggestion for how to
<table>
<thead>
<tr>
<th>Skill</th>
<th>Very Unhelpful</th>
<th>Unhelpful</th>
<th>Neither Helpful nor Unhelpful</th>
<th>Helpful</th>
<th>Very Helpful</th>
<th>Did not try it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating regularly spaced meals</td>
<td>1 (4.5%)</td>
<td>0 (0.0%)</td>
<td>12 (54.4%)</td>
<td>4 (31.8%)</td>
<td>1 (4.5%)</td>
<td></td>
</tr>
<tr>
<td>Designating &quot;eating zones&quot;</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>6 (28.6%)</td>
<td>8 (38.1%)</td>
<td>2 (9.5%)</td>
<td>4 (19.0%)</td>
</tr>
<tr>
<td>Reducing multitasking while eating</td>
<td>1 (5.0%)</td>
<td>0 (0.0%)</td>
<td>8 (38.1%)</td>
<td>3 (14.3%)</td>
<td>4 (19.0%)</td>
<td>5 (10.2%)</td>
</tr>
<tr>
<td>Labeling your emotions</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>2 (10.0%)</td>
<td>8 (40.0%)</td>
<td>6 (30.0%)</td>
<td>3 (15.0%)</td>
</tr>
<tr>
<td>Reviewing how your emotions can be useful</td>
<td>1 (4.8%)</td>
<td>2 (9.5%)</td>
<td>5 (23.8%)</td>
<td>7 (33.3%)</td>
<td>0 (0.0%)</td>
<td>6 (28.6%)</td>
</tr>
<tr>
<td>Progressive muscle relaxation</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>9 (42.9%)</td>
<td>5 (23.8%)</td>
<td>2 (9.5%)</td>
<td>4 (19.0%)</td>
</tr>
<tr>
<td>Using your list of alternative behaviors</td>
<td>1 (5.0%)</td>
<td>0 (0.0%)</td>
<td>8 (40.0%)</td>
<td>4 (20.0%)</td>
<td>1 (5%)</td>
<td>6 (30.0%)</td>
</tr>
<tr>
<td>Mindful eating</td>
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<td>1 (5.0%)</td>
<td>2 (10.0%)</td>
<td>9 (45.0%)</td>
<td>3 (15.%)</td>
<td>4 (20.0%)</td>
</tr>
<tr>
<td>&quot;Leaves on a stream&quot;</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>6 (28.6%)</td>
<td>3 (14.3%)</td>
<td>0 (0.0%)</td>
<td>11 (52.4%)</td>
</tr>
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<td>Urge surfing</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>9 (42.9%)</td>
<td>2 (9.5%)</td>
<td>0 (0.0%)</td>
<td>10 (47.6%)</td>
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<tr>
<td>Practicing mindfulness</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>4 (19.0%)</td>
<td>8 (38.1%)</td>
<td>1 (4.8%)</td>
<td>7 (33.3%)</td>
</tr>
<tr>
<td>&quot;Doing the opposite&quot;</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>5 (23.8%)</td>
<td>3 (14.3%)</td>
<td>1 (4.8%)</td>
<td>11 (52.4%)</td>
</tr>
<tr>
<td>Problem solving</td>
<td>1 (4.8%)</td>
<td>1 (4.8%)</td>
<td>1 (4.8%)</td>
<td>5 (23.8%)</td>
<td>2 (9.5%)</td>
<td>11 (52.4%)</td>
</tr>
<tr>
<td>Scheduling pleasant activities</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>1 (4.8%)</td>
<td>7 (33.3%)</td>
<td>3 (14.3%)</td>
<td>9 (42.9%)</td>
</tr>
<tr>
<td>Contacting the researcher for additional assistance</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>3 (14.3%)</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>17 (81.0%)</td>
</tr>
</tbody>
</table>
improve the appearance of the journals and one indicated they enjoyed the program but did not think their emotional eating was severe enough to fully benefit from it. Six participants provided open feedback at the 12-week assessment. The feedback continued to be positive at the 12-week assessment. Of note, one participant indicated she had done well in applying the concepts during the first six weeks, but that the final assessment coincided with final exams during which time she “gave in” to emotional eating. The open-ended responses from participants are listed in Appendix E.

Discussion

This is the first randomized controlled trial, to the investigator’s knowledge, to evaluate an intervention specifically targeting a reduction in emotional eating. The present study utilized a waitlist control design to evaluate the efficacy of an Internet-based guided self-help intervention, the RedEE Program, in reducing emotional eating among a nonclinical population. The RedEE Program contained six modules that presented participants with psychoeducation and a range of cognitive and behavioral skills, giving participants the opportunity to select and implement the strategies that best fit with their individual triggers and experience of emotional eating.

The primary hypothesis stated that participants randomized to the intervention condition would experience a reduction in emotional eating compared to waitlist participants at a 6-week post-intervention follow-up. Two measures of emotional eating were utilized to capture a range of various emotional triggers. This hypothesis was partially supported. At the 6-week assessment, participants in the intervention group experienced improvements in emotional eating, as measured by the DEBQ, and eating in response to emotions related to depression. There were no significant differences in the desire to eat specifically in response to emotions related to anxiety or anger following participation in the program.
In addition to changes in emotional eating, it was hypothesized that loss of control over eating and negative affect would also be lower among participants in the intervention condition at the 6-week assessment. This hypothesis was supported. Participants in the intervention group experienced a decrease in loss of control over eating at the 6-week assessment that was significantly greater than participants in the waitlist group. The difference in loss of control was likely driven by changes in the behavioral component of loss of control rather than the cognitive/dissociative or positive/euphoric components of the experience of loss of control over eating, which showed no change over time. The significant decrease in the behavioral subscale of the LOCES suggests that the skills introduced in the RedEE Program helped participants address the behavioral component of losing control over eating. The changes in loss of control may be related to the overlap between emotional eating and binge eating, which by definition includes loss of control. For some individuals, binge eating is triggered by emotions. The skills for reducing emotional eating may have had a direct or indirect impact on binge eating for those participants. However, it is unclear whether changes in emotional eating led to fewer episodes of binge eating, as binge eating was not the explicit target of the intervention and was not assessed at the follow-up assessments.

Negative affect was significantly lower among intervention participants at the 6-week assessment. Although there was a significant difference in negative affect between the two groups, negative affect remained unchanged for participants in the intervention group between the baseline and 6-week assessments. Participants in the intervention group may have gained skills to maintain their negative affect, while waitlist participants experienced greater negative affect over time. This difference may have emerged as participants progressed through the semester and presumably had an increase in their academic workload during the study period.
The lack of a significant change in negative affect suggests the decline in emotional eating among intervention participants was related to an improved ability to manage negative affect without food rather than a decline in the experience of negative affect itself. There was no change in positive affect among either group. This would be expected, as the program specifically addressed upsetting or distressing emotions that lead to emotional eating rather than positive emotions.

The guilt subscale of the PANAS-X revealed a similar pattern to negative affect. There was no significant difference between baseline and the 6-week assessment, but participants in the intervention condition reported less guilt than waitlist participants at the 6-week assessment. This is notable, as 64.4% of participants indicated that emotional eating led to the experience of guilt at baseline. Although directionality cannot be determined, it is possible that the decline in emotional eating among the intervention group contributed to the between-group difference in guilt at the post-intervention follow-up.

It was hypothesized the RedEE Program would be utilized by the majority of participants and yield retention rates comparable to other studies of online self-help programs. A small portion of participants assigned to the intervention group did not log on to the RedEE Program website or complete any modules. Although only 36% of participants who logged in to the program completed all six modules, half of the participants completed at least half of the modules and 68% completed at least one. The overall attrition rate at the 12-week assessment was 23.7%. Attrition was higher among the intervention group, with only 53.1% of participants in the intervention group completing at least one module and the 12-week follow-up. These rates are comparable to other studies of online self-help programs (Carrard et al., 2006; Carrard et al., 2011). Although the majority of participants did not complete all six modules of the RedEE
Program, overall satisfaction with the program was high and 90.9% of participants indicated they would recommend it to others.

The RedEE Program contained a range of behavioral and cognitive skills that can be used to reduce emotional eating. The investigator sought to assess the perceived helpfulness of each of these skills. The structure of the program was such that participants were encouraged to try each of the strategies and choose the ones that worked best for them. It was not expected that all participants would find each of the strategies useful. The frequency of participants completing each module declined throughout the program. Therefore, not all participants were exposed to each of the skills introduced in the program.

For the first two weeks of the intervention period, participants in the intervention condition had access only to modules 1 and 2. These modules provided general information about emotional eating, strategies for normalizing eating, and psychoeducation on emotions. The information in these modules was viewed as foundational by the investigator, providing the base upon which the specific skills could be used. Many participants indicated the information contained within the first two modules was helpful. Skills that were more specific to emotional eating were not introduced until the third module. Therefore, a smaller percentage of participants were able to rate the perceived helpfulness of skills introduced in the later modules. The percentage of participants rating the skills as helpful may have been impacted by the smaller sample of participants. However, the data indicate that all of the skills introduced in the RedEE Program were perceived as helpful by at least one participant. This suggests that subsequent versions of the intervention should retain the skills and strategies in the original RedEE Program.

Of note, there was a single participant who rated all but one of the skills as ‘very unhelpful’. This participant indicated they completed all six of the modules, but did not sign in to
the online program until one week prior to the 6-week assessment. It would not be expected that a participant would find the skills useful when learning them simultaneously with only one week to implement them.

An online self-help format was chosen for the intervention as opposed to an individual or group therapy format. Self-help interventions provide several benefits over more structured therapy interventions, including increased availability and flexibility, and decreased cost (Kazdin & Blase, 2011). Participants had the ability to access the program at their convenience and spend the amount of time on the program that best suited their needs.

In addition to the convenience and flexibility of self-help interventions, they may be especially useful for individuals who would not otherwise seek psychological services. Thirty-five percent of participants in the present study did not meet criteria for any psychological disorder or endorse symptoms that could be indicative of an unspecified eating disorder based on the screening measures. These individuals viewed their emotional eating as problematic and were interested in addressing their behavior, but would not otherwise meet criteria that would allow them to seek reimbursable services. Furthermore, many individuals who do meet criteria for a psychological disorder do not receive services. The disparity between those needing and receiving treatment can be seen in the present sample. Over half of the participants (64.4%) in this study endorsed symptoms that were suggestive of a mental health diagnosis at the baseline assessment. Of those thirty-eight participants, only two were receiving mental health services. It is important to note that further assessment would be need to confirm the mental health diagnoses suggested by the screening measures. Nonetheless, the disparity between the percentage of participants endorsing psychopathology and those receiving services underscores the need for efficacious self-help interventions that can be readily accessed at little to no cost.
The RedEE Program was designed to be a guided self-help intervention. Participant access to the program modules was guided by the investigator such that access to two additional models was given on a bi-weekly basis. Participants also received weekly emails from the investigator and had the opportunity to contact the investigator, a Masters-level therapist, at any time during the study for additional assistance. None of the study participants responded to the weekly emails or sent a separate email asking for assistance with the module content. This was an unexpected finding, but may suggest the intervention would be delivered to a larger population without significantly increasing therapist burden.

**Limitations**

The sample size of the study was large enough to detect meaningful differences between the intervention and waitlist groups at the 6-week assessment. However, there are several questions that could not be answered with the present sample size. The majority of participants in the intervention condition started, but did not complete the full RedEE Program. Reasons for not completing the program ranged from forgetting about the program/study to feeling as though their emotional eating had improved to a level where they did not need to continue. The low level of program completion limits the ability to draw conclusions about the overall effectiveness of the full program. Participants who completed at least one module endorsed significantly lower emotional eating, loss of control over eating, and negative affect at the 6-week assessment compared to participants in the waitlist group. However, it is possible the effectiveness of the program may be dependent upon the dose of the intervention received. Participants completing the full RedEE Program may have experienced greater improvements than those completing only half of the intervention or less. The sample size of participants completing various amounts of the intervention was too small to evaluate such effects in the present sample. Future studies
should evaluate the efficacy of the intervention with a larger population to capture potential dosing effects.

Another limitation of the present sample size is the reduced ability to detect meaningful differences at the 12-week assessment. The number of individuals completing at least one intervention module and participating in the 12-week assessment was too small to reliably detect within- and between-subjects effects. A larger sample size would allow for an enhanced evaluation of the stability of the intervention effects.

As previously discussed, a large proportion of participants met criteria for a possible mood, anxiety, substance use, or eating disorder based on the PHQ and EDDS. This partial overlap between emotional eating and other psychopathology underscores the need for an intervention that can be utilized by both clinical and non-clinical populations. However, the present sample size limits the ability to determine whether the presence of reported psychopathology impacted the efficacy of the RedEE Program. There was an equal distribution of participants reporting each form of psychopathology between the waitlist and intervention groups, and participants in the intervention group demonstrated improvements in emotional eating and loss of control as a whole. However, a larger sample size would allow for comparisons between participants endorsing psychopathology and those who endorse problematic emotional eating in the absence of any additional mental health concerns.

The ethnicity of the study population can be viewed both as a limitation and a strength. The majority of participants endorsed an Asian ethnicity. The majority of research on emotional eating has been conducted with primarily Caucasian samples. Although the present study addresses a gap in the emotional eating and treatment literature with regard to Asian populations,
it is unknown whether the efficacy of the intervention would be different when delivered to a sample that is not primarily Asian.

The online nature of the study increases the potential utility of the intervention, but presents some limitations. Delivering the intervention online rather than in person limited the amount of control the investigator had over the amount of time participants spent reviewing the program material. Efforts were made to address these limits to investigator control. The program modules were designed to build upon one another, with the first two providing the foundations needed for the remaining modules. Similarly the skills were presented in what the investigator believed would be increasing order of difficulty. The 6-week intervention period was designed to allow approximately one week to be dedicated to reviewing and practicing the material in each module. The bi-weekly cumulative access to the program modules was given in an effort to control both the amount of time spent on the modules and the order in which they were completed. However, not all participants completed the modules in order or on a weekly basis. Additionally, several participants indicated they needed more time to complete the intervention and a longer intervention period may have yielded higher completion rates.

**Future Directions**

The results of the present study suggest further evaluation of the RedEE Program is warranted among a broader range of participants, including non-students, adults, and individuals with nonclinical, subclinical, and clinical mental health and eating concerns. Expanding the study population beyond undergraduate students would capture a broader range of individuals who engage in emotional eating. Future studies should continue to include participants with a range of psychopathology. A larger sample size would allow the investigator to evaluate the impact of the intervention among individuals with comorbid psychopathology and to assess the
impact of the intervention among individuals with varying intensity of emotional eating. Such studies would help define the limits of the program’s efficacy and improve the ability to target individuals whom the intervention would be most likely to impact.

Given the relationship between emotional eating and weight, future studies should examine the efficacy of the RedEE Program among populations with elevated weight status. The intervention could potentially be a useful tool for reducing emotional eating among those seeking weight loss through either bariatric surgery or behavioral weight loss. Future research could also evaluate the utility of the RedEE Program as an adjunct treatment for those working with a dietician or therapist for concerns related to eating or mood or for those involved in a pre- or post-bariatric surgery program.

The guided element of the self-help intervention should also be evaluated further. No participants in the present study contacted the investigator for assistance with the program content. Future studies should assess whether the offer of supplemental therapist contact impacts the efficacy of the intervention. Similarly, the use of weekly email reminders and semi-controlled, cumulative access to the intervention should also be evaluated. If one or more of the guided elements of the intervention can be removed without impacting participant outcomes, it would reduce the need for therapist involvement in the program, potentially increasing the ease of delivery.

Clinical Implications

The online self-help format makes the RedEE Program a readily usable intervention that can increase access to care for individuals who want to address their emotional eating. In its current format, the intervention can be delivered by a Masters-level therapist with training in the treatment of disordered eating. The RedEE Program introduced participants to strategies and
skills drawn from different treatment approaches (e.g., cognitive behavioral therapy and mindfulness-based therapy). This provided participants with a range of tools from which to select, allowing them to tailor the intervention based on their needs and preferences. The ability to provide participants with a range of options may allow the program to be viewed as useful by a broader range of individuals. Indeed, participant feedback indicates the intervention was highly acceptable in its current format.

Emotional eating has been linked to obesity, difficulties in achieving weight loss, weight regain among bariatric surgery patients, and additional emotional distress among clinical and non-clinical populations (Canetti, Berry, & Elizur, 2009; Kayman, Bruvold, & Stren, 1990; Rusch, Andris, & Wallace, 2009; Rusch & Andris, 2007; Geliebter & Aversa, 2003). Indeed, participants in the present study endorsed emotional eating as a factor that negatively impacted their eating habits, weight, and mood. Despite the prevalence of emotional eating and its relationship with the aforementioned factors, no intervention to date has been developed to specifically address emotional eating. The present study was the first to evaluate a program targeting a reduction in emotional eating and, pending replication, supports the use of the RedEE Program for addressing emotional eating among young adults.
APPENDIX A: Eligibility and Assessment-Specific Questions

Eligibility and Baseline Questions

Please answer the following questions about yourself:

1. Male / Female (select one)
2. Age: ________
3. Primary ethnic category you identify as:___________________________
   Any additional ethnic categories you may also identify as:___________________
   _____________________________________________________________
4. Is English your primary language? (select one) YES NO
   If no, for how many years have you spoken English? ______________
5. Marital status: ________
6. Education level: __________
7. Current Height: __________
8. Current Weight: __________
9. Highest weight ever at your current height: ________
10. Lowest weight ever at your current height: ________
11. How often do you eat in response to stress or other negative/distressing emotions? (select one)
    Never Rarely Sometimes Often Always
12. How many times per week (on average) do you eat in response to stress or other distressing emotions? (select one)
    0 1-3 4-7 8-11 12-15 16-19 20+
13. How many times would you estimate that you’ve engaged in emotional eating over the past month? ______________
14. How many times would you estimate that you’ve engaged in emotional eating over the past 7 days? ______________
15. Would you like to reduce your frequency of emotional eating (select one) YES NO
16. Have you ever sought treatment for emotional eating? (select one) YES  NO
   If yes, when did you seek treatment and for how long?
   ______________________________________________________________

17. Are you currently receiving treatment from a mental health provider? (select one) YES  NO
   If yes, what are you receiving treatment for? _______________________

18. Have you ever been diagnosed with an eating disorder? (select one) YES  NO
   If yes, which one(s)? ____________________________

19. Have you ever received treatment for eating disorder? (select one) YES  NO

20. Are you currently receiving treatment for emotional eating? YES  NO

21. Are you currently taking any prescription medication (select one) YES  NO
   If yes, what are you taking? ____________________________________

22. How is emotional eating a problem for you? (select all that apply)
   ○ I feel guilty after engaging in emotional eating
   ○ I feel out of control when I emotionally eat
   ○ It leads me to eat unhealthy foods
   ○ It causes me to gain weight
   ○ It prevents me from losing weight
   ○ It is a habit I would like to gain more control over
   ○ Other ____________________________

   For women only:
   Are you currently pregnant or breastfeeding? (select one) YES  NO
Post-Intervention Questions
Have you received treatment from a mental health provider outside of this study over the past 6 weeks?

YES  NO

If YES, did you address either your mood or emotional eating with your mental health provider?

YES  NO

If YES, please explain__________________________________________________

Have you taken any new medication or experienced a change of dosage in your medication over the past 6 weeks?

YES  NO

If yes, please describe: ____________________________________________

Did you complete the entire program?

YES  NO

If NO:

How much of the program did you complete? ____________________________

Which of the 6 modules did you complete? (select all that apply)

- Module 1
- Module 2
- Module 3
- Module 4
- Module 5
- Module 6

How many total hours would you estimate you spent using the online program? _____________

If you did NOT complete the program, which of the following reasons describe your reason for not completing it? (select all that apply)

- I felt that I was doing well and no longer needed assistance in reducing emotional eating
- I felt that my emotional eating had not changed but that I no longer needed assistance in reducing emotional eating
- I did not find the program to be helpful
- I never started the program
- I started the program but forgot to complete it
- I needed more time to complete the program
- Other (please explain)_________________________________________________

How often do you eat in response to stress or other negative/distressing emotions?

Never  Rarely  Sometimes  Often  Always
How many times per week (on average) do you eat in response to stress or other distressing emotions? (select one)

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1-3</th>
<th>4-7</th>
<th>8-11</th>
<th>12-15</th>
<th>16-19</th>
<th>20+</th>
</tr>
</thead>
</table>

Which of the following strategies have you used to reduce instances of emotional eating over the past 6 weeks? (select all that apply)

- Eating regularly
- Designating eating zones
- Reducing multitasking while eating
- Reading food labels before eating
- Reviewing the adaptive function of your emotions
- Urge Surfing
- Mindfulness
- Progressive Muscle Relaxation
- Distress Tolerance
- Using your list of alternative behaviors
- Opposite Action
- Problem Solving
- Scheduling pleasant activities
- Receiving weekly messages from the researcher
- Contacting the researcher for additional assistance

Please rate how helpful you found each of the following strategies in reducing emotional eating

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Very Unhelpful</th>
<th>Unhelpful</th>
<th>Neither Helpful nor Unhelpful</th>
<th>Helpful</th>
<th>Very Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating regularly</td>
<td></td>
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<tr>
<td>Designating eating zones</td>
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<tr>
<td>Reducing multitasking while eating</td>
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<tr>
<td>Reading food labels before eating</td>
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<tr>
<td>Reviewing the adaptive function of your emotions</td>
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<tr>
<td>Urge Surfing</td>
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<tr>
<td>Mindfulness</td>
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<tr>
<td>Progressive Muscle Relaxation</td>
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<tr>
<td>Distress Tolerance</td>
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<tr>
<td>Using your list of alternative behaviors</td>
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<tr>
<td>Opposite Action</td>
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<tr>
<td>Problem Solving</td>
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<tr>
<td>Scheduling pleasant activities</td>
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<tr>
<td>Receiving weekly messages from the researcher</td>
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<tr>
<td>Contacting the researcher for additional assistance</td>
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</tbody>
</table>
How satisfied are you with the Internet-based self-help program in general?
  o  Very Dissatisfied
  o  Somewhat Dissatisfied
  o  Neither Dissatisfied nor Satisfied
  o  Somewhat Satisfied
  o  Very Satisfied

Would you recommend the program to others?
    YES    NO

And comments or feedback you might like to add:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
APPENDIX B: Measures

We all respond to different emotions in different ways. Some types of feelings lead people to experience an urge to eat. Please indicate the extent to which the following feelings lead you to feel an urge to eat by checking the appropriate box.

<table>
<thead>
<tr>
<th>Feeling</th>
<th>No desire to eat</th>
<th>A small desire to eat</th>
<th>A moderate desire to eat</th>
<th>A strong urge to eat</th>
<th>An overwhelming urge to eat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resentful</td>
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<tr>
<td>Discouraged</td>
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<tr>
<td>Shaky</td>
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<tr>
<td>Worn Out</td>
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<tr>
<td>Inadequate</td>
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<tr>
<td>Excited</td>
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<tr>
<td>Rebellious</td>
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<tr>
<td>Blue</td>
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<tr>
<td>Jittery</td>
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<tr>
<td>Sad</td>
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<tr>
<td>Uneasy</td>
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<tr>
<td>Irritated</td>
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<tr>
<td>Jealous</td>
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<tr>
<td>Worried</td>
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<tr>
<td>Frustrated</td>
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<tr>
<td>Lonely</td>
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<tr>
<td>Furious</td>
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<tr>
<td>On Edge</td>
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<tr>
<td>Confused</td>
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<tr>
<td>Nervous</td>
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<tr>
<td>Angry</td>
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<tr>
<td>Guilty</td>
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<tr>
<td>Bored</td>
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<tr>
<td>Helpless</td>
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<tr>
<td>Upset</td>
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<tr>
<td>Question</td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td>Do you have a desire to eat when you are irritated?</td>
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<tr>
<td>Do you have a desire to eat when you have nothing to do?</td>
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<tr>
<td>Do you have a desire to eat when you are depressed or discouraged?</td>
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<tr>
<td>Do you have a desire to eat when you are feeling lonely</td>
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<tr>
<td>Do you have a desire to eat when somebody lets you down?</td>
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<tr>
<td>Do you have a desire to eat when you are cross?</td>
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<tr>
<td>Do you have a desire to eat when you are anticipating something unpleasant to happen?</td>
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<tr>
<td>Do you have a desire to eat when you are anxious, worried, or tense?</td>
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<td>Do you have a desire to eat when things are going against you or when things have gone wrong?</td>
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<td>Do you have a desire to eat when you are frightened?</td>
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<td>Do you have a desire to eat when you are disappointed?</td>
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<tr>
<td>Do you have a desire to eat when you are emotionally upset</td>
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<tr>
<td>Do you have a desire to eat when you are bored or restless</td>
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<tr>
<td>If food tastes good to you, do you eat more than usual?</td>
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<tr>
<td>If food smells and looks food, do you eat more than usual?</td>
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<tr>
<td>If you see or smell something delicious, do you have a desire to eat it?</td>
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<tr>
<td>If you have something delicious to eat, do you eat it straight away?</td>
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<tr>
<td>If you walk past the baker do you have the desire to buy something delicious?</td>
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<tr>
<td>If you walk past a snack bar or café, do you have the desire to buy something delicious?</td>
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<tr>
<td>Can you resist eating delicious foods?</td>
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<td>Do you eat more than usual when you see others eating?</td>
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<tr>
<td>When preparing a meal, are you inclined to eat something?</td>
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</tbody>
</table>
Loss of Control Eating Scale

In the past 4 weeks (28 days), how often have you had the following experiences during a time when you were eating? Please respond to each item using the following scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

___ 1. I felt I had lost control over eating.
___ 2. I continued to eat past the point when I wanted to stop.
___ 3. I ate until I was uncomfortably full.
___ 4. I kept eating even though I was no longer hungry.
___ 5. I felt like I had “blown it” and might as well keep eating.
___ 6. I found myself eating despite negative consequences.
___ 7. I felt helpless about controlling my eating.
___ 8. While eating, I had feelings of shame.
___ 9. While eating, I felt I was stuffing myself.
___ 10. While eating, I felt disgusted.
___ 11. While eating, I felt a sense of relief or release.
___ 12. While eating, I felt a physical rush or high.
___ 13. While eating, I felt like I was watching or looking at myself from “outside”.
___ 14. I felt like the craving to eat overpowered me.
___ 15. My eating felt like a ball rolling down a hill that just kept going and going.
___ 16. I lost track of what and how much I was eating.
___ 17. While eating, I felt like I was not paying attention to what I was eating.
___ 18. While eating, I felt like I was in my own little world.
___ 19. I couldn’t concentrate on anything other than eating.
___ 20. I felt like I couldn’t do anything other than eat.
___ 21. I finished eating only to discover I had eaten more than I thought.
___ 22. I felt I was eating faster than normal.
___ 23. Eating as quickly as possible seemed to be the only thing that mattered.
___ 24. While eating, it didn’t seem real.
PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past week. Use the following scale to record your answers:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>very slightly or not at all</td>
<td>a little</td>
<td>moderately</td>
<td>quite a bit</td>
<td>extremely</td>
</tr>
<tr>
<td>____ cheerful</td>
<td>____ sad</td>
<td>____ active</td>
<td>____ angry at self</td>
<td></td>
</tr>
<tr>
<td>____ disgusted</td>
<td>____ calm</td>
<td>____ guilty</td>
<td>____ enthusiastic</td>
<td></td>
</tr>
<tr>
<td>____ attentive</td>
<td>____ afraid</td>
<td>____ joyful</td>
<td>____ downhearted</td>
<td></td>
</tr>
<tr>
<td>____ bashful</td>
<td>____ tired</td>
<td>____ nervous</td>
<td>____ sheepish</td>
<td></td>
</tr>
<tr>
<td>____ sluggish</td>
<td>____ amazed</td>
<td>____ lonely</td>
<td>____ distressed</td>
<td></td>
</tr>
<tr>
<td>____ daring</td>
<td>____ shaky</td>
<td>____ sleepy</td>
<td>____ blameworthy</td>
<td></td>
</tr>
<tr>
<td>____ surprised</td>
<td>____ happy</td>
<td>____ excited</td>
<td>____ determined</td>
<td></td>
</tr>
<tr>
<td>____ strong</td>
<td>____ timid</td>
<td>____ hostile</td>
<td>____ frightened</td>
<td></td>
</tr>
<tr>
<td>____ scornful</td>
<td>____ alone</td>
<td>____ proud</td>
<td>____ astonished</td>
<td></td>
</tr>
<tr>
<td>____ relaxed</td>
<td>____ alert</td>
<td>____ jittery</td>
<td>____ interested</td>
<td></td>
</tr>
<tr>
<td>____ irritable</td>
<td>____ upset</td>
<td>____ lively</td>
<td>____ loathing</td>
<td></td>
</tr>
<tr>
<td>____ delighted</td>
<td>____ angry</td>
<td>____ ashamed</td>
<td>____ confident</td>
<td></td>
</tr>
<tr>
<td>____ inspired</td>
<td>____ bold</td>
<td>____ at ease</td>
<td>____ energetic</td>
<td></td>
</tr>
<tr>
<td>____ fearless</td>
<td>____ blue</td>
<td>____ scared</td>
<td>____ concentrating</td>
<td></td>
</tr>
<tr>
<td>____ disgusted with self</td>
<td>____ shy</td>
<td>____ drowsy</td>
<td>____ dissatisfied with self</td>
<td></td>
</tr>
</tbody>
</table>
Patient Health Questionnaire

This questionnaire is an important part of providing you with the best health care possible. Your answers will help in understanding problems that you may have. Please answer every question to the best of your ability unless you are requested to skip over a question.

1. During the last 4 weeks, how much have you been bothered by any of the following problems?  
   a. Stomach pain..................................................... □ □ □  
   b. Back pain......................................................... □ □ □  
   c. Pain in your arms, legs, or joints (knees, hips, etc.) □ □ □  
   d. Menstrual cramps or other problems with your periods.................................................. □ □ □  
   e. Pain or problems during sexual intercourse .......... □ □ □  
   f. Headaches......................................................... □ □ □  
   g. Chest pain......................................................... □ □ □  
   h. Dizziness........................................................... □ □ □  
   i. Fainting spells.................................................... □ □ □  
   j. Feeling your heart pound or race........................ □ □ □  
   k. Shortness of breath............................................. □ □ □  
   l. Constipation, loose bowels, or diarrhea............. □ □ □  
   m. Nausea, gas, or indigestion............................... □ □ □  

2. Over the last 2 weeks, how often have you been bothered by any of the following problems?  
   a. Little interest or pleasure in doing things.............. □ □ □ □  
   b. Feeling down, depressed, or hopeless.................. □ □ □ □  
   c. Trouble falling or staying asleep, or sleeping too much.................................................. □ □ □ □  
   d. Feeling tired or having little energy.................... □ □ □ □  
   e. Poor appetite or overeating............................... □ □ □ □  
   f. Feeling bad about yourself — or that you are a failure or have let yourself or your family down... □ □ □ □  
   g. Trouble concentrating on things, such as reading the
3. Questions about anxiety.

a. In the last 4 weeks, have you had an anxiety attack — suddenly feeling fear or panic? .......................... NO YES

If you checked “NO”, go to question #5.

b. Has this ever happened before? .....................

c. Do some of these attacks come suddenly out of the blue — that is, in situations where you don’t expect to be nervous or uncomfortable? ......................

d. Do these attacks bother you a lot or are you worried about having another attack? ......................

4. Think about your last bad anxiety attack. NO YES

a. Were you short of breath? ..........................

b. Did your heart race, pound, or skip? .............

c. Did you have chest pain or pressure? ............

d. Did you sweat? ..........................

e. Did you feel as if you were choking? .............

f. Did you have hot flashes or chills? .............

g. Did you have nausea or an upset stomach, or the feeling that you were going to have diarrhea? .............

h. Did you feel dizzy, unsteady, or faint? ...........

i. Did you have tingling or numbness in parts of your body? ..........................................................

j. Did you tremble or shake? ..........................

k. Were you afraid you were dying? .................
5. Over the last 4 weeks, how often have you been bothered by any of the following problems?

   a. Feeling nervous, anxious, on edge, or worrying a lot about different things……………………………

   If you checked “Not at all”, go to question #6.

   b. Feeling restless so that it is hard to sit still…………
   c. Getting tired very easily…………………………
   d. Muscle tension, aches, or soreness………………
   e. Trouble falling asleep or staying asleep…………
   f. Trouble concentrating on things, such as reading a book or watching TV……………………………
   g. Becoming easily annoyed or irritable…………

6. Questions about eating.

   a. Do you often feel that you can’t control what or how much you eat?……………………………………..
   b. Do you often eat, within any 2-hour period, what most people would regard as an unusually large amount of food?……………………………………………………

   If you checked ‘NO’ to either #a or #b, go to question #9.

   c. Has this been as often, on average, as twice a week for the last 3 months? ………………………………….

7. In the last 3 months have you often done any of the following in order to avoid gaining weight?

   a. Made yourself vomit? .................................
   b. Took more than twice the recommended dose of laxatives? .................................
   c. Fasted — not eaten anything at all for at least 24 hours? .................................
   d. Exercised for more than an hour specifically to avoid gaining weight after binge eating?...

8. If you checked ‘ YES’ to any of these ways of avoiding gaining weight, were any as often, on average, as twice a week?………
9. Do you ever drink alcohol (including beer or wine)?

[ ] NO  [ ] YES

If you checked “NO” go to question #11.

10. Have any of the following happened to you more than once in the last 6 months?

[ ] NO  [ ] YES

a. You drank alcohol even though a doctor suggested that you stop drinking because of a problem with your health.

b. You drank alcohol, were high from alcohol, or hung over while you were working, going to school, or taking care of children or other responsibilities.

c. You missed or were late for work, school, or other activities because you were drinking or hung over.

d. You had a problem getting along with other people while you were drinking.

e. You drove a car after having several drinks or after drinking too much.

11. If you checked off any problems on this questionnaire, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

[ ] Not difficult at all  [ ] Somewhat difficult  [ ] Very difficult  [ ] Extremely difficult

12. In the last 4 weeks, how much have you been bothered by any of the following problems?

[ ] Not bothered  [ ] Bothered a little  [ ] Bothered a lot

a. Worrying about your health.

b. Your weight or how you look.

c. Little or no sexual desire or pleasure during sex.

d. Difficulties with husband/wife, partner/lover or boyfriend/girlfriend.

e. The stress of taking care of children, parents, or other family members.

f. Stress at work outside of the home or at school.

g. Financial problems or worries.

h. Having no one to turn to when you have a problem.

i. Something bad that happened recently.
j. Thinking or dreaming about something terrible that happened to you in the past - like your house being destroyed, a severe accident, being hit or assaulted, or being forced to commit a sexual act. 

13. In the last year, have you been hit, slapped, kicked or otherwise physically hurt by someone, or has anyone forced you to have an unwanted sexual act? 

14. What is the most stressful thing in your life right now?

15. Are you taking any medicine for anxiety, depression or stress?  

16. FOR WOMEN ONLY: Questions about menstruation, pregnancy and childbirth.

   a. Which best describes your menstrual periods?

<table>
<thead>
<tr>
<th>Periods are unchanged</th>
<th>No periods because pregnant or recently gave birth</th>
<th>Periods have become irregular or changed in frequency, duration or amount</th>
<th>No periods for at least a year</th>
<th>Having periods because taking hormone replacement (estrogen) therapy or oral contraceptive</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

   b. During the week before your period starts, do you have a serious problem with your mood - like depression, anxiety, irritability, anger or mood swings?  

   c. If YES: Do these problems go away by the end of your period? 

   d. Have you given birth within the last 6 months? 

   e. Have you had a miscarriage within the last 6 months? 

   f. Are you having difficulty getting pregnant?
EDDS
Please carefully complete all questions.

<table>
<thead>
<tr>
<th>Over the past 3 months…</th>
<th>Not at all</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you felt fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Have you felt a definite fear that you might gain weight or become fat?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Has your weight influenced how you think about (judge) yourself as a person?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Has your shape influenced how you think about (judge) yourself as a person?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</table>

5. During the past 6 months have there been times when you felt you have eaten what other people would regard as an unusually large amount of food (e.g., a quart of ice cream) given the circumstances?  YES  NO

6. During the times when you ate an unusually large amount of food, did you experience a loss of control (feel you couldn't stop eating or control what or how much you were eating)?  YES  NO

7. How many days per week on average over the past 6 months have you eaten an unusually large amount of food and experienced a loss of control? 0 1 2 3 4 5 6 7

8. How many times per week on average over the past 3 months have you eaten an unusually large amount of food and experienced a loss of control? 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

During these episodes of overeating and loss of control did you…

9. Eat much more rapidly than normal?  YES  NO

10. Eat until you felt uncomfortably full?  YES  NO

11. Eat large amounts of food when you didn't feel physically hungry?  YES  NO

12. Eat alone because you were embarrassed by how much you were eating?  YES  NO

13. Feel disgusted with yourself, depressed, or very guilty after overeating?  YES  NO

14. Feel very upset about your uncontrollable overeating or resulting weight gain?  YES  NO

15. How many times per week on average over the past 3 months have you made yourself vomit to prevent weight gain or counteract the effects of eating? 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
16. How many times per week on average over the past 3 months have you used laxatives or diuretics to prevent weight gain or counteract the effects of eating? 

<table>
<thead>
<tr>
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<th>0</th>
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<td>12</td>
<td>13</td>
<td>14</td>
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</tbody>
</table>

17. How many times per week on average over the past 3 months have you fasted (skipped at least 2 meals in a row) to prevent weight gain or counteract the effects of eating? 

<table>
<thead>
<tr>
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<td>12</td>
<td>13</td>
<td>14</td>
</tr>
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</table>

18. How many times per week on average over the past 3 months have you engaged in excessive exercise specifically to counteract the effects of overeating episodes? 

<table>
<thead>
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<th>3</th>
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<td>11</td>
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<td></td>
<td>12</td>
<td>13</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

19. How much do you weigh? If uncertain, please give your best estimate. ____________ lbs.

20. How tall are you? Please specify in inches (5 ft. = 60 in.) ____________ in.

21. Over the past 3 months, how many menstrual periods have you missed? 

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>n/a</th>
</tr>
</thead>
</table>

22. Have you been taking birth control pills during the past 3 months? YES NO
APPENDIX C: Consent Form

Agreement to Participate in a Research Study
University of Hawaii at Manoa

Internet-Based Guided Self-Help for the Reduction of Emotional Eating

This research project is being conducted by a graduate student in the Department of Psychology at the University of Hawai‘i-Manoa to examine the effectiveness of a new Internet-based self-help treatment program for emotional eating. Participation in this study will involve the completion of 3 anonymous online (Internet) surveys and the use of an Internet-based self-help program over the course of 12 weeks. You are being asked to participate in this project because you are at least 18 years old, are enrolled as a student at UH Manoa, and reported eating in response to stress or distressing emotions as well as a desire to reduce emotional eating.

Project Description – Activities and Time Commitment: There are two major components to this study 1) The completion of 3 surveys and 2) Participation in the Internet-based program.

Surveys will be completed at your first assessment session (today), 6 weeks, and 12 weeks. You will be contacted in 6 and 12 weeks with the link to complete the follow-up surveys online. Your height and weight will also be measured at the end of the first assessment session (today) in order to obtain an accurate Body Mass Index. The first assessment will take approximately 20-25 minutes (10-15 minutes to complete the survey and 10 minutes to have the study and website explained, set up your Coursesites.com account [described below], measure your height and weight and answer any remaining questions you may have) and the 6 and 12-week assessments will take approximately 10-15 minutes to complete.

During the first assessment, you will be randomly assigned to either Group 1 or Group 2. Group 1 will complete the program during the first 6 weeks of the study and Group 2 will receive access to the program after the 12-week assessment. The program will be delivered through Coursesites.com, a secure website that will contain the content of the program and allow for weekly contact with the researcher. At the first assessment, the researcher will create your Coursesites account using a unique username and password for you to use in order to access the online self-help program. Participants in Group 2 will be sent their password to access the program after completion of the 12-week survey. The program contains a series of modules related to the treatment of emotional eating. You are encouraged to work through each of the modules, in order. The researcher will contact you through the Coursesites website on a weekly basis to check on your progress and offer any assistance you may need. You are also encouraged to respond to these weekly messages and to contact the researcher with any questions or concerns regarding the study or program content throughout the study period. You may spend as much or as little time as you would like using the program once you have been given your password.

Some participants will be randomly selected to meet with the investigator following either the 6-week or 12-week assessment. The meeting will last approximately 15 minutes and the PI will ask...
about your opinion of the program with the goal of improving it for future users. If selected, you will receive an email from the investigator inviting you to schedule a meeting. You can choose whether or not you would like to schedule an appointment. Declining to meet with the investigator will not impact your ability to participate in the study or the program.

**Risks:** There may be certain risks or discomforts associated with this research. There is potential for you to experience psychological distress or discomfort when reading about how to manage eating and emotions. However, the program is designed to teach you strategies to manage any discomfort that may arise through your participation.

**Benefits:** There may be no direct benefit to you for participating in this study. However, it is hoped the intervention is designed to reduce instances of emotional eating and improve overall quality of life of participants. Additionally, the results of this project may contribute to the development of an effective Internet-based self-help intervention for the treatment of emotional eating that could be made available to the broader population.

**Compensation:** Course credit will be provided for participating in surveys at baseline, 6 and 12 weeks.

**Confidentiality and Privacy:** Your name and contact information will be collected in order to contact you for the 6- and 12-week assessments and will not be used for any other purpose. Your name will not be associated with any of your survey responses or with your individual Coursesites account, and no identifying information will be used in the creation of your Coursesites account. You will be given a unique username to use for the Coursesites account and you will use this username when completing your surveys. The researcher will keep a document containing the link between your name and Coursesites username in a locked file. If you forget your username, you may contact the researcher who will access the file to give you your username. The file will not be opened for any other reason and will be destroyed following the study.

**Voluntary Participation:** Participation in this project is voluntary. You can freely choose to participate or to not participate in this study, and there will be no penalty or loss of benefits for either decision. If you agree to participate, you can stop at any time without any penalty or loss of benefits to which you are otherwise entitled.

**Questions:** If you have any questions about this study, you can contact the investigator, Mackenzie Kelly, at mkelly4@hawaii.edu. If you have any questions about your rights as a research participant, you can contact the UH Human Studies Program at 808.956.5007 or uhirb@hawaii.edu.
Agreement to Participate in a Research Study

Internet-Based Guided Self-Help for the Reduction of Emotional Eating

Participant:
I have read and understand the above information and have been given the opportunity to ask questions. I agree to participate in this research project.

___________________________________
Name (Printed)

___________________________________
Signature

______________________________
Date
Module 1: 
Introduction to Emotional Eating and Normalizing Eating

What is emotional eating?

Emotional eating is eating when you are stressed, angry, frustrated, sad, or when you experience other upsetting emotions.

Approximately 40% of the population eats more in response to stress, 40% eats less in response to stress, and 20% of the population does not change their eating habits when stressed.

Why does emotional eating occur?

The most common pattern of emotional eating begins with stress. When you interpret a situation as significantly stressful, the body produces a chain of responses, which include an increase in cortisol (a stress hormone) and insulin. These changes can lead people to seek out foods that are high in fat and sugar.

Once you have eaten, the food acts as a switch and turns off your body’s initial response to stress (step 1 below). This signals to your body that everything is ok and blocks your body’s stress response (step 2 below). The physical decrease in the stress response leads to emotional relief from stress as well. Your body feels less stressed and you feel less stressed!
The more often this pattern occurs, the stronger it becomes. Eventually, some people begin to associate eating with a feeling of both physical and emotional relief. They learn that eating makes them feel better when they are stressed.

Over time, the link between stress and eating begins to trickle over into other emotions. People will begin to eat in response to even minor stressors or upsetting emotions. These upsetting emotions do not cause the same changes in the body that we see with stress, but the link we have made between “feeling bad” and eating leads us to eat anyway. In other words, what started out as a natural response to stress becomes overgeneralized to other emotions.

If emotional eating is a natural response, how do I change it?

The good news is, there are many opportunities to intervene in this chain! The RedEE Program will teach you strategies to help you:

1. Identify where you are in the chain and
2. Find strategies to help you interrupt the pattern at various points in the chain.
Normalizing Eating

Before we talk about specific strategies for reducing emotional eating, it is important to address eating habits more broadly. The first step in reducing emotional eating is establishing a normal eating pattern. This first week, take a look at your own patterns of eating using three key principles. By using these guidelines, you will increase your chances of success in reducing emotional eating.

Some general guidelines:

1. When to eat

Have you ever tried to study for an exam after skipping a meal? When you haven’t had enough to eat it can be difficult to focus on challenging tasks! Reducing emotional eating can be challenging, but it becomes even harder if your brain and body are not properly fed. The RedEE Program will introduce you to a number of strategies for reducing emotional eating, but they will not be helpful if you are not eating regularly.

So what should you do?

Try to space your meals and snacks evenly throughout the day. When you go for long periods of time without eating, you are placing additional stress on your body. We call this “calorie deprivation”. The added stress our body experiences when it is deprived of calories can be a tipping point for emotional eating:

Going for long periods of time without food also makes you more likely to overeat at your next meal. Overeating can lead to even greater distress, adding more fuel to the chain.
A general rule-of-thumb that tends to work for most people is to **avoid going for more than 4 hours without having something to eat.** This may sound like a short amount of time, but if you look at the examples below, you’ll see that this guideline allows for 3 meals and 0-3 snacks per day. The timing of your meals will depend on your individual schedule (e.g., when you wake up and go to bed, when you have class or work, etc.) For example, if you tend to stay up late with a long gap between dinner and going to bed, it may be helpful to eat a snack between dinner and bedtime.

If this type of eating schedule is new to you it might take some time to get used to. It can be helpful to set a single pattern for eating throughout the week. However, schedules tend to differ from day to day, which may make it difficult to stick with a single schedule. Not to worry! The most important thing is to avoid putting your body into a deprived state on any given day. Planning out your days in advance may increase your chances for success and reduce eating triggered by a combination of emotion and hunger.

**Sample Schedules for Meals and Snacks**

<table>
<thead>
<tr>
<th>10:00 am</th>
<th>Breakfast</th>
</tr>
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<tbody>
<tr>
<td>2:00 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>6:00 pm</td>
<td>Dinner</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9:00 am</th>
<th>Breakfast</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>3:00 pm</td>
<td>Snack</td>
</tr>
<tr>
<td>7:00 pm</td>
<td>Dinner</td>
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<table>
<thead>
<tr>
<th>7:00 am</th>
<th>Breakfast</th>
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<tbody>
<tr>
<td>10:00 am</td>
<td>Snack</td>
</tr>
<tr>
<td>1:00 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>5:00 pm</td>
<td>Snack/Dinner</td>
</tr>
<tr>
<td>8:00 pm</td>
<td>Dinner/Snack</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8:00 am</th>
<th>Breakfast</th>
</tr>
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<tbody>
<tr>
<td>10:00 am</td>
<td>Snack</td>
</tr>
<tr>
<td>1:00 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>4:00 pm</td>
<td>Snack</td>
</tr>
<tr>
<td>7:00 pm</td>
<td>Dinner</td>
</tr>
<tr>
<td>9:00 pm</td>
<td>Snack</td>
</tr>
</tbody>
</table>
2. Where to eat

Where you eat can have an impact on emotional eating. When people have busy schedules, it is common for them to eat at their desk, in their car, or while sitting on the couch. When addressing emotional eating, it can be helpful to limit eating to specific locations that do not overlap with other activities. We call these specific locations “eating zones”. An ideal eating zone would be a kitchen table or counter, but any setting that separates eating from other tasks will do.

**Why should you establish eating zones?** There are several problems associated with eating in your car, at your desk, in bed, or while sitting on the couch:

1. These places may be linked to upsetting emotions. For example, if you become stressed while working at your desk and you also eat while at your desk, your brain begins to associate sitting at your desk with both stress and eating. Over time, you may begin to feel the urge to eat while sitting at your desk, even if you aren’t especially stressed.

2. When we eat in these locations, we are often multitasking and eating becomes automatic. Our brain is not focusing on food we are eating, which can lead us to eat more than we had planned. As mentioned earlier, eating more than you plan to can cause some people to experience additional distress and maintain the loop of emotional eating.

Think for a moment:

*What does your schedule look like tomorrow?*

**Write out your schedule for tomorrow**

How can you make sure that you do not go more than 4 hours without having something to eat tomorrow?

**Write in estimated times of when you will be able to eat meals and snacks**

Try to do this throughout the week. Remember, it may take some flexibility!
Some place-emotion links could include:

- Being anxious about traffic or stressed about being late while driving in the car
- Worrying about your grades while studying for an exam in your dorm room
- Sitting down on the couch to watch TV after a stressful day
- Dealing with an overwhelming workload while at your office

How to create “eating zones”:

- Try to avoid eating in the car whenever possible.
- If you are in a dorm room, try to establish separate places for eating, studying, and sleeping. If you are limited on space, this may mean sitting in a different chair or could be as simple as moving your computer away from your desk while eating.
- If you tend to eat while on the couch, try moving to a table instead. Turning off the TV would be even better. You can eat your meal and return to your couch and television show as soon as you are done.
- If you are at work, try getting away from your desk for meals and snacks.

Think for a moment:

Where do you tend to eat?

Make a list of all the places you usually eat throughout the week.
(No need to include restaurants!)

Get specific! If you eat most of your meals at home, where are you sitting?
In the kitchen? At your desk? In your room? On the couch?
If you eat in your dorm, where are you sitting? Do you eat in the car? While working?

Use your list to identify places that:

1. May be linked with stress or negative emotions
2. May be associated with multitasking

Think of some alternative locations that might be better “eating zones”
3. What to eat

Have you noticed that you have a tendency to go for a specific food when you are stressed or upset? Many people tend to choose foods that are high in fat and sugar when they are upset. These are often referred to as “comfort foods”. There is a biological reason for this—as mentioned earlier, the fat and sugar in foods can reduce the body’s response to stress. We can not change this biological process, but we can control which foods we choose to bring into our living or workspace.

**FUN FACT**

Several studies have found that, when stressed, well-fed mice will eat foods that are high in fat and sugar.

**The interesting part:**
If there are no high-fat or high-sugar foods around and they only have their normal rat food, they won’t eat when stressed!

They weren’t eating because they were hungry (remember, they were well-fed), they were eating because of the specific foods that were available to them.

**What does this mean for humans?**
If you limit the amount of “comfort foods” you keep around your dorm room, house, or apartment, you will be less likely to eat when you are stressed!

**So what foods should I keep around?**
“Normal” foods that you do not eat when you are stressed. These can include fruits and vegetables, lunchmeat, basically anything you do not consider a “comfort food”!

It is important to note that we are NOT suggesting that your comfort foods are “bad” in any way or you should completely eliminate them from your diet. You can still eat them! What we ARE suggesting is that limiting your access to these foods when you can will be helpful in your efforts to reduce emotional eating.

There will be times when you do not have the ability to control what food is around you—we’ll talk about how to handle those situations later. For now, try to focus on structuring your home and work environment in a way that will support your efforts to reduce emotional eating!
Think for a moment:
*What are your “comfort foods”?*

Make a list of the foods you tend to eat when stressed or upset

Try to keep these foods out of your house, apartment, or dorm.
If you already have these foods around you could:
1. Wait until you run out of them and then choose not buy them again
2. Find somewhere else to keep them
3. Get rid of them

Make a list of the foods you are less likely to eat when stressed or upset

Try to bring *more* of these foods in your house, apartment, or dorm

Remember, you can still eat these foods—just try not to bring them in your home. Keeping them out of your home will make it harder to emotionally eat!

**So, the basic guidelines are as follows:**

1. **When to eat:** Eat regularly-spaced meals throughout the day and try to avoid going more than 4 hours without having something to eat
2. **Where to eat:** Work to establish eating zones to separate eating from other tasks or locations that may be linked to strong emotions
3. **What to eat:** Try to limit the amount of “comfort foods” that are readily available in your home or work space. Fill your pantry with foods you are *less* likely to eat when stressed, such as fruits, vegetables.
Let’s use an example to illustrate these three basic guidelines:

**Example 1: Lisa**
Lisa is an undergraduate student taking 15 credit hours and working a part-time job as a server at a restaurant. She works long hours without eating and often grabs whatever is available in the pantry when she gets home because she is too tired to cook. When Lisa has had an especially stressful day, she enjoys coming home and relaxing by grabbing a bag of her favorite chips and watching television shows recorded on her DVR.

**We can use the three principles we’ve discussed to evaluate Lisa’s situation**

1. **When to eat.** Lisa can not control her work schedule, but going for long periods of time without eating leaves her with little energy to do anything when she gets home. Lisa might benefit from taking an easy snacks with her to work, such as a granola bar, and from keeping alternative food choices in her pantry for nights when she is too tired to cook. By not eating regularly, Lisa may have a difficult time focusing on implementing alternative strategies for dealing with her stress.

2. **Where to eat.** For Lisa, eating on the couch is tied to her stress. It is possible that this habit of eating chips on the couch spills over to evenings where she is not stressed. Over time, Lisa will likely crave chips whenever she is watching tv on his couch (even if she isn’t stressed!). If she were to limit herself to eating at the kitchen table, she might be able to break the pattern.

3. **What to eat.** Chips are Lisa’s preferred comfort food. It may be helpful for Lisa to avoid purchasing chips for her apartment as she begins the process of trying to reduce emotional eating. By not having chips easily accessible in times of stress, Lisa will have the opportunity to use different strategies to deal with the stress of her day. For example, she may find that just watching television is enough to help her relax after a long day.
Module 1 Review

Key points:
• Eating is a normal biological response to stress that can become overgeneralized to minor stressors and other emotions
• The first step in reducing emotional eating is insuring that you are giving your body adequate nutrition throughout the day
• Try to avoid going more than 4 hours without having something to eat
• It can be helpful to designate certain places in your dorm, apartment, home, or office as “eating zones”
• Try to limit the amount of “comfort foods” you keep at home or at work to reduce your chances of eating in response to stress or distressing emotions

Exercise 1
Use the three guidelines to evaluate your eating habits over the week. Try to establish a normal pattern of eating. This will include incorporating regularly-spaced meals and snacks throughout the day, identifying places that you can designate as “eating zones”, reducing the availability of “comfort foods”, and increasing the availability of non “comfort foods”. Making these changes will support your efforts to reduce emotional eating in the upcoming weeks.

You may find it helpful to use Module 1 Journal to record your answers to the questions from the “think for a moment” thought bubbles in this module.
Module 2:
Identifying and Understanding Emotions

By now, you have spent some time setting up a normal pattern of eating, establishing eating zones, and keeping comfort foods out of your home or workplace. Keep working on those guidelines—it will make things easier as you go through the RedEE Program! In this module, we will take a closer look at emotions.

Identifying Emotions
As the name suggests, emotional eating happens when we feel certain emotions – we will call these “triggering emotions” or “triggers”. Remember the picture below? All of the words in the red bubbles are examples of triggers.

As you work through the RedEE Program, it will be helpful for you to know which emotions are your triggers for emotional eating.

What am I feeling?

"I just feel BAD!"

Sometimes we know exactly how we are feeling. Other times, it can be hard to know which emotion (or emotions) we are experiencing. When this happens, we might say that we feel “bad”. However, “bad” is not an actual emotion. Feeling “bad” could be related to many different emotions—the trick is figuring out which one(s)!

When we experience emotions, both our brain and our body react. When we don’t know exactly how we are feeling, it may be easier to think about how our body feels. Changes in our body, like an upset stomach or a racing heart can be easy to identify. When you notice a change in your
emotions, first try to identify what changes are happening in your body. Then, use that information to figure out which emotion(s) you are feeling.

The chart below has a list of common emotions. The **bolded** words are major categories of emotions. The words under the bolded ones are related emotions. The top row lists many different sensations you might feel in your body. When you know how your body feels, you can use the chart below to narrow down which emotion(s) you may be feeling.

---

**Did you know…**
You can experience multiple emotions at the same time! You can even feel two emotions that don’t seem to go together. For example, imagine you and a friend are both applying for the same job. Your friend gets the job and is very excited—it’s her dream job. You can be both happy for her and sad for yourself at the same time. You may even feel guilty about being upset!

---

**Let’s practice using the Body-Emotion chart**
You are studying for an exam and you begin to feel “bad”. You notice that you are having trouble concentrating on your textbook. You try to relax, but you can’t seem to get your focus back. Your heart begins to race and you start to feel nauseous. You dislike this feeling and have no idea what it is or where it came from. You are thinking about going to the kitchen to grab your favorite comfort food. STOP! Take a look at the Body-Emotion chart. A racing heart can be related to anxiety, guilt, or fear. Being unable to relax, having difficulty focusing, and nausea are also related to anxiety. Based on the Body-Emotion chart, you are likely feeling anxious. You may be anxious about how you will do on the exam you are studying for.

Sometimes the **Body-Emotion chart** above will be enough to identify which emotion(s) you are feelings. Other times, you may need to go a step further.

We often take actions based on our emotions. These actions may happen without us even thinking about them! One example of an emotion-relation action is crying. Occasionally, you may begin crying before you even realize you are upset! We can use actions as additional clues to identify exactly which emotion(s) we are feeling. The chart below is called the **“Action-Emotion” chart**. It lists some common actions people take when they experience emotions. You can use this chart alone, or with the **Body-Emotion chart** above.
# Body-Emotion Chart

<table>
<thead>
<tr>
<th>How Your Body Feels</th>
<th>Heart Racing</th>
<th>Upset Stomach</th>
<th>Nauseous</th>
<th>&quot;Heavy&quot; stomach</th>
<th>Trouble Breathing</th>
<th>Lump in Your Throat</th>
<th>Unable to Relax</th>
<th>Tight Muscles in Your Body</th>
<th>Tight Muscles in Your Jaw or Face</th>
<th>Blushing/Red Face</th>
<th>Clenched Fists</th>
<th>Low Energy</th>
<th>Trouble Focusing</th>
<th>Urge to Cry</th>
<th>Jittery</th>
<th>Unable to Sleep</th>
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</thead>
<tbody>
<tr>
<td><strong>Anger</strong></td>
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<tr>
<td>Amoroyed, Irritated, Offended, Upset</td>
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<td>X</td>
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<tr>
<td><strong>Anxiety</strong></td>
<td>X</td>
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<tr>
<td>Nervous, Worried, Stressed, Overwhelmed</td>
<td>X</td>
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<td>X</td>
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<tr>
<td><strong>Disgust</strong></td>
<td>X</td>
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<tr>
<td>Aversion, Revulsion</td>
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<td><strong>Fear</strong></td>
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<tr>
<td>Frightened, Panicked, Uneasy, Terrorized</td>
<td>X</td>
<td>X</td>
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<td><strong>Guilt</strong></td>
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<td>Embarrassed, Remorseful</td>
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</tr>
<tr>
<td><strong>Sadness</strong></td>
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<td>X</td>
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<tr>
<td>Unhappy, Hurt, Sorrow, Hurt</td>
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<td>X</td>
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<tr>
<td><strong>Shame</strong></td>
<td>X</td>
<td>X</td>
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<tr>
<td>Remorseful, Responsible</td>
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<td>X</td>
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</tbody>
</table>

Adapted from Taitz, 2012

You can download this chart to use on-the-go by clicking on “Body-Emotion Chart” in the Module 2 folder right above the start of this module.
### Action-Emotion Chart

Common behaviors related to each emotion

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Common Behaviors Related to Each Emotion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anger</strong>&lt;br&gt;Annoyed, Irritated, Offended, Upset</td>
<td>Defending yourself, threatening others, yelling, withdrawing from people or activities</td>
</tr>
<tr>
<td><strong>Anxiety</strong>&lt;br&gt;Nervous, Worried, Stressed, Overwhelmed</td>
<td>Avoiding people and places that are feared, looking for reassurance from others</td>
</tr>
<tr>
<td><strong>Disgust</strong>&lt;br&gt;Aversion, Revulsion</td>
<td>Pushing people away, avoiding people or situations, expressing concern about a person or situation</td>
</tr>
<tr>
<td><strong>Fear</strong>&lt;br&gt;Frightened, Panicked, Uneasy, Terrorized</td>
<td>Running, &quot;freezing up&quot;, screaming, crying, seeking safety</td>
</tr>
<tr>
<td><strong>Guilt</strong>&lt;br&gt;Embarrassed, Remorseful</td>
<td>Hiding, Trying to repair the damage done</td>
</tr>
<tr>
<td><strong>Sadness</strong>&lt;br&gt;Unhappy, Hurt, Sorrow, Hurt</td>
<td>Lying in bed, isolating yourself from other people, losing motivation, losing interest in people or activities</td>
</tr>
<tr>
<td><strong>Shame</strong>&lt;br&gt;Remorseful, Responsible</td>
<td>Apologizing, reflecting on what happen that led to shame, changing your behavior to correct whatever was done</td>
</tr>
</tbody>
</table>

Adapted from Taitz, 2012

You can download this chart to use on-the-go by clicking on “Action-Emotion Chart” in the Module 2 folder right above the start of this module.
Think for a moment:
Be an emotional detective

Think about a recent time when you felt a strong emotion or emotionally ate.
Write down the following:

1. What did it feel like in your body?
2. Were they any emotion-related actions you took at the time?

Use the Body-Emotion chart and the Action-Emotion chart to label your triggering emotion.

If you labeled your emotion in the moment, did your label match up to what is in the Body-Emotion chart?

Why do we have emotions?
Some emotions can be uncomfortable, which leads us to think of them as “bad”. We feel like we need to get rid of as soon as possible. We eat to get rid of these emotions. But what if we didn’t think of emotions as something we need to get rid of? What if they serve a purpose?

Emotions serve an important role—they help tell us about what is going on around us.

Let’s think about this in a different way.
When you stub your toe, you feel pain. The pain draws your attention to your toe—it lets you know something is wrong. The pain is a cue that you should pay attention to your toe. Can you imagine what it would be like if you could not feel pain? You might cut your leg on a branch while hiking and have no idea!

Emotions serve the same purpose as pain—they are a cue that something is going on. The Function-Emotion chart below highlights the important role emotions can play.
Instead of think of emotions as something that we need to get rid of, we should think of them as important cues. We may need to change our behavior, change our environment, slow down, or speed up! Emotions give us a boost to do these things.

### Function-Emotion Chart

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anger</strong>&lt;br&gt;Annoyed, Irritated, Offended, Upset</td>
<td>Allows us to respond to a violation. Maybe something bad or unfair has happened to us or someone we care about</td>
</tr>
<tr>
<td><strong>Anxiety</strong>&lt;br&gt;Nervous, Worried, Stressed, Overwhelmed</td>
<td>Protects us from future danger. Sometimes there is a real threat and other times it is an imagined threat.</td>
</tr>
<tr>
<td><strong>Disgust</strong>&lt;br&gt;Aversion, Revulsion</td>
<td>Prompts us to move away from someone or something negative</td>
</tr>
<tr>
<td><strong>Fear</strong>&lt;br&gt;Frightened, Panicked, Uneasy, Terrorized</td>
<td>Protects us from immediate danger</td>
</tr>
<tr>
<td><strong>Guilt</strong>&lt;br&gt;Embarrassed, Remorseful</td>
<td>Promts us to correct our behavior</td>
</tr>
<tr>
<td><strong>Sadness</strong>&lt;br&gt;Unhappy, Hurt, Sorrow, Hurt</td>
<td>Slows us down; Gives us time to cope with the loss of a person or desired goal</td>
</tr>
<tr>
<td><strong>Shame</strong>&lt;br&gt;Remorseful, Responsible</td>
<td>Reminds us to live according to our values</td>
</tr>
</tbody>
</table>

Adapted from Taitz, 2012

You can download this chart to use on-the-go by clicking on “Function-Emotion Chart” in the Module 2 folder right above the start of this module.
So I can label my emotions and I know why I have them. Now what?
Labeling your emotional triggers is an important part of reducing emotional eating.

Just knowing it is normal and okay to have these emotions can be helpful for some people.

Practice, Practice, Practice!!
Even if you think you know what your emotional triggers are, try using the charts in this module to identify your emotions. Pay careful attention to your emotions over the next several weeks to see if you are right!

In Module 3, we will begin to review some specific strategies for emotional eating. For now, take some time to get comfortable identifying your triggering emotions. Practice labeling your emotions and even saying them out loud. It may sound silly, but saying how you are feeling out loud can help give you some space between yourself and your emotion.
Module 2 Review

Key points:
- Emotions that lead to emotional eating are called “triggering emotions”
- Knowing what your triggering emotions are will help you reduce emotional eating
- When you do not know which emotion(s) you are feeling, ask yourself:
  1. How does this emotion feel in my body?
  2. What else am I doing that may give me hints about my emotion?
- Emotions are useful! They are cues that something is going on we should pay attention to.

Exercise 2
Practice labeling your emotions. You can do this for emotions that come up throughout the week. Even if you do not feel the urge to emotionally eat, practice labeling the emotions you experience. Use the Body-Emotion chart and the Action-Emotion chart to help label your emotion(s). Review the Function-Emotion chart the remind yourself why you emotions are important and useful.

Once you have labeled your triggering emotions, practice saying your them out loud in the moment (e.g. “I am feeling sad”, “I am feeling guilty”, “I am feeling angry”).

You may find it helpful to use the Module 2 Journal to record your answers to the “think for a moment” bubble in this module.
Module 3:
Behavioral Skills and Coping Strategies (Part I)

In Modules 1 and 2 you learned how to normalize your eating patterns and how to identify your trigger emotions.

If you have not gone through Modules 1 and 2, please read them before moving on to Module 3.

You may have found that eating regularly throughout the day, creating “eating zones” and keeping comfort foods out of your home and workspace has already reduced how often you emotionally eat. You may have also found that simply labeling your emotions and thinking of them as normal instead of bad has helped.

“But I still eat when I’m upset!”

Now it’s time to learn how to keep yourself from turning to food when you experience your triggering emotions! Module 3 will teach you some specific strategies to reduce emotional eating.

In the original pathway to emotional eating, food was the final stop. This pattern of eating when you are upset has likely become automatic. You may not always plan to end up there -- it just happens! At other times, you may choose to eat, thinking that it will be the easiest (or most satisfying) way to make yourself feel better. But what if you had other options?

Step on the breaks and find another route!
What are some other routes you can take?

There are several things you can do when you feel the urge to eat when triggered. Modules 3-5 will cover a range of strategies. In this module we will focus on some alternative behaviors.

Below are some things you can do when you experience your trigger emotions:

**Progressive Muscle Relaxation**

In Module 2, you learned about the physical changes that accompany your triggering emotions. We talked about how the physical changes that we experience with emotion can help us identify which emotion we are experiencing. We can also use those physical cues to CHANGE our emotions.

When it comes to emotions, the mind tends to follow the body. When your body is tense, you feel stressed. When your body is relaxed, your mind follows. Muscle tension, a racing heart, and difficulty breathing are associated with stress, anger, frustration, anxiety, worry, guilt, nervousness, and being overwhelmed (to name a few). **Progressive Muscle Relaxation** is an organized way to reduce muscle tension, slow your heart rate, and relax your body.

**How it works:** You can practice Progressive Muscle Relaxation in any position, but it works best if you are sitting or lying down. Find a comfortable position and close your eyes. Breathe slowly and deeply throughout the practice. You will work through each of the muscle groups in your body, slowly tensing and relaxing your hands, arms, shoulders, stomach, legs, etc. You can work through each muscle group until you’ve gone from head to toe (or toe to head, whichever you prefer!). The order does not matter. Just take your time and pay attention to how your body feels. Progressive Muscle Relaxation should leave your body and mind feeling relaxed!
Try it out! Use the Progressive Muscle Relaxation recording above Module 3 and try it out! This recording is just one example of how Progressive Muscle Relaxation works. You can come up with your own routine or search the Internet for other examples (there are PLENTY of examples on Youtube). You may need to go through the recording more than once or find a longer recording. Progressive Muscle Relaxation can be a great alternative to eating when your trigger emotions are linked with muscle tension, a racing heart, or difficulty breathing.

Deep Breathing
Slow, deep breathing is part of Progressive Muscle Relaxation, but it deserves attention on its own. There may be times where it is not possible to do Progressive Muscle Relaxation, but you can always focus on your breathing. Try breathing in through your nose for 8 seconds, hold it in for 3 seconds, and breathe out for 8 seconds. You may want to adjust the timing. The important part is to slow down your breath and take as much time to breathe in as you do to breathe out.

Smile!
It may sound silly, but simply smiling can lift your mood. It’s called facial feedback. Just like the brain take cues from muscles in the body, it also takes cues from the muscles in the face! When the muscles used to smile are active, people report feeling happier. If you are likely to eat when your mood is low, try smiling!

You may not always be in a situation where it feels appropriate to smile, or you may be concerned about how you may look to others. There is a way around this. Studies have shown that when people hold a pencil in their teeth (mimicking a smile) their mood improves!

Alternative Activities
Progressive Muscle Relaxation and smiling are two examples of using your body to change your emotions. What else can you do to reduce your chances of eating when you experience your emotional triggers? Are there other ways to relax your body and improve your mood? Many people also find it helpful to replace eating with another activity. Doing another activity can take your mind off of whatever has upset you, reduce the intensity of your emotions, and reduce your chances of eating. Take some time to create a list of alternatives to eating when triggered.

It can be especially helpful to think of activities that are no compatible with eating. For example, you wouldn’t go on a walk and eat at the same time. Activities that make it difficult to eat may be more effective activities you can do while eating. For example, taking a shower or painting your nails may be more helpful than watching a movie.

Think about activities that have helped you feel better in the past.
Studies have shown that the intensity of negative emotions can go down in as few as three minutes. When making a list of activities, try to think of things that will take at least 3 minutes. This will give you time to experience a decrease in the strength of your trigger emotion and reduce your urge to eat. You may even set a timer on your phone to make sure you take at least 3 minutes. If you have the time, take longer than 3 minutes—the longer the better!

You may also consider where you are when you emotionally eat. Sometimes we have the ability to walk away from an upsetting situation and other times we do not. For example, if you are in class and become stressed, you may not be able to get up and leave. You’ll want to think of things you can do when you CAN stop whatever you are doing and things you can do when you CAN NOT stop whatever you are doing.

A few ideas to get you started:

<table>
<thead>
<tr>
<th>When you can leave where you are</th>
<th>When you can not leave where you are</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to the beach</td>
<td>Progressive Muscle Relaxation</td>
</tr>
<tr>
<td>Surfing</td>
<td>Watch a movie/television show</td>
</tr>
<tr>
<td>Go for a walk</td>
<td>Listen to music</td>
</tr>
<tr>
<td>Go to the gym</td>
<td>Hold a pencil in your teeth</td>
</tr>
<tr>
<td>Go to a movie</td>
<td>Draw/paint/write</td>
</tr>
<tr>
<td>Visit a friend</td>
<td>Read a book/article</td>
</tr>
</tbody>
</table>
Think for a moment:
*What are some alternative activities?*

Write down the common places/situations where you emotionally eat

For each place/situation, write down alternatives for emotional eating
Make your lists as long as possible.

*Get Creative!*
See the examples below for some ideas. Use the ideas above and below as a place to start and come up with other alternatives. What are the things (other than eating) that make you feel better?

---

### Sample lists of alternatives for different places

#### Place: Dorm Room/Home
1. Progressive Muscle Relaxation*
2. Go on a 5-minute walk
3. Talk to my roommate*
4. Call a friend*
5. Watch an episode of my favorite TV show on Netflix*
6. Listen to some upbeat music*
7. Go to the gym
8. Go to a yoga class
9. Work on homework*

*Things I can do if I can't leave the room/office

#### Place: Work (office)
1. Go get a cup of water*
2. Walk outside for 5 minutes
3. Talk to a positive co-worker*
4. Step outside and call a friend
5. Text a friend*
6. Progressive Muscle Relaxation*
7. Find an interesting blog or article to read*
8. Take 10 slow, deep breaths*
9. Put in headphones and listen to my favorite playlist*

#### Place: Work (restaurant)
1. Go get a cup of water
2. Ask someone to cover my tables for 5 minutes and find a place to step away to
3. Take 10 slow, deep breaths
4. Read a positive statement I wrote in my phone
5. Distract myself by asking if anyone needs help
6. Smile! I'll deal with the problem later if I'm not feeling better!
Keep your list(s) with you whenever possible. When you are “in the moment” and feel the urge to eat, it can be hard to think about anything else. Having your list with you will make it easier to remember your alternative activities when you are upset.

**Time to Practice!**

Practice using the items on your “alternative activities” list. Keep track of which strategies you try and how helpful they are. You may want to use the chart below as a way to track which strategies work for which situation/emotion.

<table>
<thead>
<tr>
<th>Situation: ____________________________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion: _____________________________________________</td>
</tr>
<tr>
<td>Strength of urge to eat (0-100): __________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies I tried</th>
<th>Helpfulness in this situation (0-100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
</tr>
</tbody>
</table>

(you can use more or fewer lines as needed)

It is important to remember that some of your alternatives may not reduce your distress as much or as quickly as eating will. At these times, remind yourself *WHY* you are trying to do something different. Remember that you chose to enter this program because emotional eating causes you additional stress. Your alternative activities may not be as immediately effective as eating, but they are more likely to make you feel better in the long-term!
Module 3 Review

Key points:
- If our body feels relaxed or happy, our emotions can follow. Doing things that will relax your body can help relax your mind. Try Progressive Muscle Relaxation or deep breathing to relieve tension, anxiety, anger, etc.
- Smiling, or even holding a pencil with your teeth, can help lift your mood.
- Create a list of alternatives to emotional eating. Activities that can not be done while eating may be more effective.
- Try using each strategy for at least 3 minutes. Try doing them longer for more intense emotions.
- You may need to try each of these strategies several times before you know whether or not it will work for you.

Exercise 3
Create a list of alternative activities and try them out! Try Progressive Muscle Relaxation.
Keep track of the strategies you find helpful. Be sure to note what situation and emotion each strategy was helpful for!
Module 4:
Cognitive Skills and Coping Strategies

In Module 3 you learned some ways to break the pattern of eating when you are triggered. These were behavioral strategies—ways of changing your behavior to reduce emotional eating. In Module 4, you will learn some cognitive strategies, or ways of thinking differently, that can help reduce emotional eating.

If you have not gone through Modules 1, 2, & 3 please read them before moving on to Module 4.

When can cognitive strategies be helpful?

In Module 1, you learned that it can be helpful to limit the number of comfort foods you bring into your home or workplace. Sometimes we are not able to control our environment in this way. For example, you may have a family member or roommate who insists on having comfort foods around the house. Your workplace may have a snack table. Maybe it’s hard to keep yourself from buying these foods when you are at the grocery store. That’s ok! You can still find ways to reduce your chances eating when your comfort foods are around!

For situations like these, mindfulness can be a helpful practice.

What is “mindfulness”?
Mindfulness involves slowing down your mind and body. It allows you to become more aware of both yourself and your environment. Being mindful can help you think about things differently.

The goal of mindfulness is to create a sense of what we call “nonjudgmental awareness”. What does it mean to be nonjudgmental? Sometimes we make judgments about our thoughts (“I know it sounds silly, but...”, “I shouldn’t feel that way”, “I wish I didn’t feel this way”). When we make these judgments, we are telling ourselves that our thoughts are “bad” or “wrong”. These judgments can lead us to experience negative emotions.

The key to mindfulness is being aware of our thoughts without judging them or trying to change them. It may seem strange to think about observing our thoughts and emotions without trying to change them. After all, this program is designed to teach you strategies to change your emotional eating habit. However, removing judgment from our thoughts can make it easier to change our behavior.
For example, if I were to say:

“Whatever you do, do NOT think about a pink elephant! It is BAD to think about a pink elephant and if you think about one you need to get it out of your mind”

You would probably find it difficult to keep yourself from thinking about a pink elephant! You might eventually become stressed about the fact that you couldn’t get the pink elephant out of your mind.

If instead, I were to say:

“Pay attention to whatever enters your mind. You may think about a pink elephant or you may not. If you think about a pink elephant, it’s ok, just notice that thought or image along with anything else that comes to mind”

You would probably think about the pink elephant in this case as well, but the image may not stay in your mind as long. Giving yourself permission to think about something without trying to change it opens up space in your mind to think about other things and to act differently.

**In other words…**

Mindfulness allows us to become more aware of our thoughts, emotions, and urges without trying to change them. When we don’t try to change our thoughts, they tend to bother us less.

**How will mindfulness help with emotional eating?**

Mindfulness can help reduce emotional eating in many ways.

1. Mindfulness can reduce both the strength and duration of your negative emotions
2. It can change the way you view your situation, resulting in less stress
3. It can be helpful in situations where you are around comfort foods
4. It can make you more aware of what and how much you are eating
5. It can help you eat less of your comfort foods when you do eat
6. It can help in situations where you are not able to do something on your list of “alternative activities”

**WARNING: Mindfulness takes practice!**

The mind is like a muscle that can be strengthened the more it is used. Most people need to practice the strategies below more than once before they begin to notice any changes. Just be patient and willing to try something new! Don’t give up! If you find it challenging, just come back to it later and remember you can always email RedEEStudy@gmail.com if you need more help.
Let’s give mindfulness a try!
Below are several strategies to practice mindful. Work through each of the strategies in the order they are listed.

**Mindful Eating**

The first step in practicing mindfulness is learning how increase your awareness—to become more aware of what is happening.

A great way to increase your awareness is through an exercise called Mindful Eating. Remember back to Module 1 when we talked about establishing eating zones and not multitasking while eating? Mindful eating is the OPPOSITE of multitasking while eating. When you eat mindfully, you pay close attention to the way your food tastes and feels while eating. This serves two purposes:

1. It allows you to practice general mindfulness skills. You will need to pay close attention to your food while eating mindfully, directing your attention away from any distracting thoughts or activities happening around you.

2. It gives you the opportunity to really taste what you are eating. We are often so busy that we do not pay close attention to what we taste throughout a meal. We notice how something tastes during our first few bites, but many people stop paying attention after that. Paying attention to what you are eating can help you enjoy the meal more.

This exercise has an added bonus for emotional eating. In addition to creating awareness, it can also help reduce the amount of food you eat when you are triggered. Mindfulness can help you notice signals that you are full and lead you to stop eating sooner.

A brief description of mindful eating is listed below. Use the more detailed description in the blue box to practice mindful eating.

You will choose a small piece of food and spend at least 1 minute tasting a single bite. You will pay attention to how it tastes, how it feels in your mouth, and how the taste changes over the minute. You can repeat this exercise several times (it is best to do it when you are not especially hungry). Many people find that they eat less when they practice mindful eating. It will also help you practice slowing down and becoming more aware of what is happening in the moment.
Once you have used mindful eating to practice increasing your awareness, you can move on to the “nonjudgmental” portion of mindfulness. Below is an exercise that will teach you how to practice observing your thoughts without judging them.

**“Leaves on a Stream”**

A great way to practice mindfulness is with an exercise called “leaves on a stream”.

This is a good way to begin looking at your thoughts without making judgments about them or trying to change them.

In the green box below is a script that will guide you through the ‘leaves on a stream’ exercise. You will be instructed to imagine that you are sitting or standing near a stream with leaves floating past you. If you find it difficult to create a mental image of leaves floating down a stream, you can change the image to fit what makes the most sense to you. Maybe you would prefer to imagine yourself snorkeling or visiting an aquarium with fish swimming by or lying on the beach watching airplanes pass overhead. The basic principle is the same regardless of what image you use.
Once you have practiced creating nonjudgmental awareness with “leaves on a stream”, you can begin to apply that skill to emotional eating!

“Urge Surfing”

Once you’ve had some practice using mindfulness, you can use it to observe your thoughts, urges, and emotions related to emotional eating. When you experience a trigger emotion, you feel the urge to eat.

As you know, waves come in all shapes and sizes. Urges are like waves! Some rise and crash quickly, while others disappear before they gain force. Some are powerful, while others are more of a slow roll. Most importantly, urges, like waves, eventually disappear.

Many of our urges go away within 30 minutes. Sometimes they may go away more quickly and other times it may take closer to an hour. So what do you do during those 30 minutes? You “surf” the urge!
Urge surfing will help you “ride the wave” of whatever urge or emotion you experience. You will use the skills from the “leaves on a stream” exercise to pay attention to your thoughts, urges, and emotions related to emotional eating. **Be an observer.** Do not try to change your urges or judge them as “bad” or “frustrating”. Simply notice any thoughts or emotions that come up and pay attention to what happens to them **over time.** Some people prefer to monitor their urges continuously, while find it helpful to “check in” with their urges every 5 minutes.

The **purple box** below explains urge surfing in more detail.

---

**Urge Surfing**

Try to use urge surfing whenever you experience a trigger emotion or you have the urge to eat.

The next time you encounter a triggering emotion and experience an urge to eat, use your mindfulness skills to draw your awareness to your thoughts. What thoughts are you having? What emotions are you experiencing? What does your body feel like? Do not try to push your thoughts from your mind. Instead, acknowledge your thoughts and sit with them. Eventually, they will go away, just like the leaves floating down the stream.

Do your emotions/urges come on quickly or do they slowly gain intensity? Do they stay for 15 minutes or do they start to fade away after 5? Surf the wave of your emotions/urges without acting on them. Just observe them.

Some people find it helpful to “check in” with their thoughts/emotions/urges every 5 minutes until they are gone. Other people prefer to monitor them continuously until they go away. Try both and find what works best for you. The goal is to observe your thoughts/urges/emotions as they come and go. You are NOT trying to MAKE them go away (remember…no judgment!), but eventually all urges to go away.

Many urges will go away within 30 minutes. If it takes longer, stick with it until the urge is gone. Try to practice urge surfing whenever you can. If you give in to your urge, that’s ok. If you are unable to sit through your urge at any given time, try to be mindful while eating and then try to surf the urge again the next time.

---

**Practice, Practice, Practice!**

Mindfulness is an ongoing practice. It is like a muscle that needs exercise in order to become stronger. The more you do it, it easier it becomes! You will want to find ways to strengthen your mindfulness skills throughout the week. This can be done through either planned or unplanned practice.
**Module 4 Review**

**Key points:**
- Mindfulness can help us think about situations differently and can help reduce emotional eating.
- Mindfulness involves “nonjudgmental awareness”, being aware of our thoughts, urges, and emotions without judging them or trying to change them.
- Mindfulness can be especially helpful when behavioral strategies (e.g., going for a walk, calling a friend) are not possible or helpful. It can also be useful in situations where we do not have control over the foods that are around us.
- Mindfulness takes practice. You will need to use the exercises below more than once and it may take you a while to get comfortable with nonjudgmental awareness.
- KEEP PRACTICING!

**Planned Practice:** Try to find 1-2 times per week where you can set aside at least 5 minutes to practice mindfulness. It is best to find a time when you will be alone and in a comfortable place. Some people find it helpful to practice mindfulness for 5-10 minutes before they go to bed at night. Others like to use their time in the shower as a way to practice mindfulness. Scheduling time to practice will ensure that you give yourself the opportunity to strengthen your mindfulness skills. Mindful Eating and Leaves on a Stream are two examples of planned practice.

**Unplanned Practice:** We all encounter numerous opportunities to practice mindfulness throughout the day: waiting at a traffic light, walking to class, eating a meal, having a conversation with a friend. Take advantage of these opportunities whenever possible and practice being aware of your thoughts and the things that are happening around you. Mindful Eating and Urge Surfing can also be a form of unplanned practice.

**Exercise 4**
Use the colored boxes in the module to practice Mindful Eating, “Leaves on a Stream”, and Urge Surfing. Schedule time to practice mindfulness throughout the week and take advantage of unplanned opportunities to strengthen your mindfulness skills.

You may find it helpful to use Journal 4 to track your mindfulness practice and record your progress.
Module 5:
Behavioral Skills and Coping Strategies (Part II)

Modules 3 & 4 introduced you to several strategies to help you reduce emotional eating when triggered. In Module 3 you learned some activities that can take the place of eating when triggered. Module 4 taught you the cognitive strategy of mindfulness, or increasing awareness of your thoughts/urges/emotions without judging or trying to change them.

If you have not gone through Modules 1 - 4 please read them before moving on to Module 5.

At this point in the RedEE Program, we hope that you have identified a handful of strategies that help reduce eating when you experience your trigger emotions. This module will introduce you to the last 3 strategies in the RedEE Program. Try to use these strategies in addition to the ones that are already working for you.

1. Doing the Opposite

Remember this figure from Module 3?

“Doing the opposite” is another strategy you can use to break the pathway that leads to eating when triggered. It is another detour! This strategy is more advanced than those introduced in Module 3. It works best if you are able to identify your specific trigger emotion.
What does it mean to “do the opposite”?  
The opposite of sadness is happiness. The opposite of uncertainty is confidence. The opposite of anger is calm. “Doing the Opposite” means acting in a way that is consistent with the opposite of the emotion you are feeling. In order to use this strategy you need to use the following steps:  
1. Identify your trigger emotion  
2. Ask yourself how you act when you feel your trigger emotion  
3. Identify the opposite of your emotion  
4. Think about how you would act if you were feeling that opposite emotion?  
5. Do it!

### Examples of “doing the opposite”

<table>
<thead>
<tr>
<th>Trigger Emotion</th>
<th>Related Behavior(s)</th>
<th>Opposite Emotion</th>
<th>Opposite Behavior(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sadness</td>
<td>Crying; isolate yourself; stay in bed/at home</td>
<td>Happiness</td>
<td>Smile; talk to friends/family; be active; get out of the house/your room</td>
</tr>
<tr>
<td>Anger</td>
<td>Tensing your muscles; yelling</td>
<td>Empathy/Calm</td>
<td>Relaxing your muscles; speaking in a calm tone of voice</td>
</tr>
<tr>
<td>Fear/Anxiety</td>
<td>Avoidance; giving up</td>
<td>Confidence/Calm</td>
<td>Move forward; keep working</td>
</tr>
<tr>
<td>Lonely</td>
<td>Isolate yourself</td>
<td>Sociable</td>
<td>Call a friend or family member; find a club to join on or off campus (e.g., book club, bible study, hiking group); get out of your room/house</td>
</tr>
<tr>
<td>Disinterest/ Boredom</td>
<td>Being inactive</td>
<td>Interest/ Energized</td>
<td>Get active! Go for a walk; go to a different place; clean your room/car; get organized; do schoolwork</td>
</tr>
</tbody>
</table>

It may feel fake, but it serves a purpose. It should feel unnatural at first. You’ve seen examples of how behaving differently can change your emotions. Smiling can lead to happiness and Progressive Muscle Relaxation can ease tension and anxiety. When you do the things that happy people do, you will begin to think happier thoughts and feel more happiness.
So far, the strategies you have learned have been aimed at thinking or acting differently when you experience your trigger emotion and have an urge to eat. “Doing the opposite” helps when you are already experiencing your trigger emotion.

The next two strategies target a different part of the chain.

2. Pleasant Activity Scheduling

Another way to reduce emotional eating is to do things that promote positive or pleasant emotions. Scheduling pleasant activities throughout the week can boost your mood and reduce your chances of experiencing negative emotions.

Including pleasant activities in your week will elevate your mood. This can reduce your overall stress levels and can help you avoid the emotional eating chain altogether!
Your list of pleasant activities can include anything from reading a book outside to surfing! Below are examples of activities that have helped people lift their mood in the past:

- Going for a walk
- Having a picnic on the beach
- Reading a good book
- Going to the movies
- Going shopping with a friend
- Playing video games with a friend
- Going on a hike
- Having a BBQ with friends
- Swimming/watersports
- Painting/Drawing/Coloring
- Cooking/Trying a new recipe
- Taking a fitness class at the gym

*What are some activities that put you in a good mood?*

**Create a list of activities that help reduce your stress levels and elevate your mood**

This can include items from your “list of alternative activities” from Module 3 or anything else you have learned in the RedEE Program. What have you done in the past to manage your stress levels?

*Look at your schedule for the next week*

Try to identify 3 times during the week when you can schedule in time for at least one of the activities on your list.
The more time you can find for pleasant activities during the week, the better! If your schedule is full, don’t worry! Even three 10-15 minute blocks of time can help boost your mood over the week.

3. Problem Solving

By now you may have noticed that you can predict when you are more likely to emotionally eat. There may be certain situations that you know will lead to a trigger emotion. Maybe you tend to emotionally eat when you have an exam or when you have to work long hours. Maybe you emotionally eat after you argue with a friend or when you are running late because of traffic.

What are some common situations that lead to your trigger emotions? Think about what you can do to:
1. Reduce your chances of being in that situation
2. Change how you think about your situation (especially if you are unable to change it)

Let’s look at each of these individually

Reducing your chances of being in your triggering situation

The first step in problem solving is identifying situations that you have (at least some) control over. What are the aspects of your trigger situations that you have control over? Are you taking on more responsibility than you can handle? Are you putting yourself in a situation that you could avoid altogether? This form of problem solving can help reduce emotional eating by thinking ahead and avoiding the distressing part of the situation. If the situation can not be completely avoided, problem solving can at least reduce your chances of experiencing distress.

It can be helpful to plan ahead when using this form of problem solving. Let’s use the example of Becca below:
In Becca’s case, there were many things she could do to control her situation and reduce her stress and anxiety. However, there may be times when you have little to no control over your situation. In these cases you may need to

**Becca’s Example**

Becca is a procrastinator. She often waits until the last minute to start her school assignments and underestimates how long it will take her to complete a task. Becca cares about her grades and worries about getting a bad grade whenever she is rushing to complete an assignment. When Becca is cramming for a test or rushing to finish a paper she experiences stress and anxiety. She will eat whatever is in her dorm room or will go to the grocery store to buy snacks.

**How can Becca use Problem Solving?**

If school-related stress leads Becca to emotionally eat, she should look for ways to reduce her chances of being in these stressful situations. School seems to be a significant stressor for her. Quitting school is not a reasonable solution for Becca and tests and assignments can not be avoided. If procrastination is causing her stress, Becca should look for ways to address her procrastination. Possible strategies could be:

- Keeping a calendar with all of the due dates clearly labeled
- Labeling assignments as being due several days before the actual due date
- Finding a friend to study with
- Breaking her assignments/studying up into chunks rather than trying to do it all at once
- Rewarding herself with a pleasant activity whenever she finishes an assignment
- Asking her professor for an extension on an assignment before it is due

Using any of these strategies can help decrease the amount of school-related stress Becca experiences.

In Becca’s case, there were many things she could do to control her situation and reduce her stress and anxiety. However, there may be times when you have little to no control over your situation. In these cases you may need to
Change how you think about your situation

Sometimes we are not able to avoid a triggering situation. There may be little we can do to change it, but we can change how we think about a situation. Sometimes problem solving involves finding a less-upsetting way to think about our situation.

How do we change the way we think about a situation? Sometimes it can be helpful to think of the situation as a challenge or an opportunity to grow in some way. For example, if you have a fear of flying and you have to take a trip to the mainland, you could think of the trip as an opportunity to conquer your fear!

It can also be helpful to think of a stressful situation as irrelevant. By thinking of a situation as irrelevant, you are detaching yourself from the upsetting portion of the situation. This reduces the power it has over your emotions (similar to nonjudgmental awareness). For example, if you are stuck in traffic, instead of worrying about being late you could think, “Everyone else is probably running late too” or “It’s ok, I’ll get there eventually”. These types of thoughts can reduce the stress you experience in the moment.

Take a look at the example below to see how this type of problem solving can work:
At times, it may be difficult to come up with alternative ways to think about your situation. This is one of the tougher strategies, which is why we put it last! Try to spend some time thinking about your common trigger situations and think about how you could use problem solving to change either the situation or your emotional reaction to the situation.

Michael’s Example
In addition to being a student, Michael works at a restaurant in Waikiki. He needs the job to afford his off-campus apartment and enjoys being around most of his co-workers. The only problem is his manager. The manager at his restaurant does not seem to like Michael. The manager regularly gives him the worst shifts and makes negative comments towards Michael whenever he works. Whenever this manager is working, Michael becomes angry. Michael does not feel comfortable confronting his manager and does not want to cause a scene, so he usually goes to the kitchen and eats some french fries that the kitchen staff sets aside for the wait staff.

How can Michael use problem solving?
Michael does not want to quit his job and does not feel comfortable saying something to his manager. It is unlikely that his manager will be fired, so what options does Michael have? In a situation like this, where Michael has little control, he can control how he thinks about the situation. Some examples of how Michael could think differently about the situation include:

• Michael might consider this a challenge and decide to turn the situation into a game where he says something nice to his manager whenever his manager makes a negative comment. (challenge)
• “I like my job aside from my manager. I’m glad I have a job that helps me pay the rent and I enjoy the other people I work with. There are plenty of people who have to deal with a rude co-worker or manager. This is just preparing me for my next job” (opportunity for growth)
• “My manager must be an unhappy person. I’m glad I don’t act that way towards other people” (not relevant)
• “It probably has nothing to do with me. I’m just going to ignore him as much as possible” (not relevant)
• “I’m not going to let a negative person control my behavior. I’m going to give my customers great service and leave here with some money at the end of the night” (not relevant)

Although Michael can’t control his manager’s behavior, he may be able to use problem solving to change his own behavior when his manager is rude. Below are some ways that Michael can use problem solving change his own behavior:

• Michael could stay away from the part of the kitchen where the french fries are kept
• He could bring an alternative snack to work that is not a “comfort food”
Module 5 Review

Key points:

- “Doing the Opposite” means acting as if you were experiencing the opposite of your trigger emotion.
- Planning time in your schedule to do activities that reduce stress and increase positive emotions can help fend off negative emotions and emotional eating.
- You can use problem solving to address the situations that lead to emotional eating.
- Sometimes we can do things differently to avoid triggering situations and other times we can think about the situation differently to change our reaction to it.

Exercise 5

Practice using each of the 3 strategies in Module 5.

- Write down your trigger emotions, the opposite emotion, and what “doing the opposite” will look like for you. Try “doing the opposite” the next time you encounter a trigger emotion.

- Look at your schedule for the week. Find time to fit in some activities that lift your mood. Even if you can only find 10-15 minutes, something is better than nothing!

- Write down the situations that lead to emotional eating for you. Use problem solving to reduce the impact the situation has on your mood. Are there things you can do to reduce your chances of being in these situations to begin with? Are there ways you could think about your situation differently?
Module 6: 
Long-term management of emotional eating

Congratulations!
You’ve made it to the end of the Reducing Emotional Eating Program!

Over the past 6 weeks, you have learned what emotional eating is and why it happens. By now, you have had some practice identifying situations and emotions that lead to emotional eating. Making it to the end of the RedEE Program does not mean your work is done. Managing emotional eating is a long-term project. In this final module, we will review the skills you have learned and discuss how to continue managing your emotional eating.

Important points to remember

Eating is a natural response to stress for 40% of the population. Eating in response to other emotions is a habit that stems from this natural stress response. Emotional eating develops over time, which means that reducing emotional eating will take time as well.

Remember, this program was not designed to completely eliminate emotional eating in everyone who goes through it. If you do not feel like you have reduced your emotional eating over the past 6 weeks, do not be discouraged! The RedEE Program has taught you skills to reduce emotional eating. Each of the skills you have learned takes practice!

Building your Emotional Eating Toolbox

Think about the skills you have learned as tools for reducing emotional eating. Each of the strategies can be placed in your emotional eating toolkit. Whenever you experience a triggering emotion or situation, open up your toolkit and find the strategy that will be most helpful to you in that moment. Below is an inventory of the “tools” you have been given in the RedEE Program. You are encouraged to go back and read through a module or section if you need a reminder of the specifics of any of these strategies.
Reviewing the strategies you’ve learned

Module 1

**Eating regularly throughout the day**
Try to schedule meals and snacks regularly throughout the day and avoid going for more than 4 hours without having something to eat. Going for long periods of time without eating makes us more susceptible to both emotional eating and overeating, which can lead to even more distress.

**Designating places as “eating zones”**
Reserving places in your home or workspace for eating (and not another activity) can help reduce cravings and break any emotional link between eating and events that take place.

**Reducing multitasking while eating**
People tend to eat more if they multitask while they eat.

**Limiting the number of “comfort foods” you bring in to your home or work**
If you do not have any comfort foods available to you when you are triggered, you will be less likely to emotionally eat.

Module 3

**Progressive Muscle Relaxation**
If our bodies feel relaxed, our emotions can follow.

**Deep breathing**
You can slow your breathing and heart rate to calm your body down when feeling stressed or upset.

**Smiling (facial feedback)**
Simply smiling (or holding a pencil in your teeth to mimic a smile) can lift your mood.

**Creating a list of alternative activities**
Having a list of activities to turn to when you are triggered can make it easier to resist emotional eating in the moment.
A slip is just a slip
Whenever we learn a new skill or try to change a habit, we are bound to make mistakes or fall back into old habits. That’s just part of the process! There may be times when life becomes hectic and you find yourself slipping back into emotional eating. When this happens, it is important to remember is that a slip does **not** mean that your efforts are not working. A slip is just a slip.
If you do find that you have slipped, it may be helpful to review modules 1 and 2 again. Going back to the basics and re-assessing your emotions can help get you back on the right track before you start using the strategies again.

Module 6 Review

Key points:
- Reducing emotional eating takes time.
- You will need to continue practicing the skills you have learned in the RedEE Program to help reduce your emotional eating over time.
- Slips should be expected. Having a rough day, week, or month does not mean that your hard work in this program has been lost. Remember, you can always use the skills you have learned to get back on track.
- If you are having trouble, go back and review the modules, starting with Modules 1 and 2.

Exercise 6
You may find it helpful to use the module journal to complete this final exercise.

Make a list of the strategies and skills that you have found helpful. Next to each strategy, write down the situations and emotions that the skill tends to help with. Whenever you experience one of these situations or emotions, you can turn to your list for some in-the-moment help.

Then, make a list of the skills you need more practice with. Try to find times to practice these skills to build your toolbox.
APPENDIX E: Qualitative Responses

“Other” reasons for not completing the full program

- “The link doesn’t work”
- “My studying and doing extra credit program because my baby still wakes up during the night”
- “I was doing the program, then had other major problems with my mental/emotional condition. I sought help from a therapist, but realized I was doing some of the strategies in the modules”
- “Too busy with classwork/studying, also juggling lab work and a part-time job as well”

6-week comments about the program

- “Thank you for helping me.”
- “I really enjoyed the journals, I thought they were useful. Perhaps, to make it easier, if it is possible to be able to view the journal prompts in the create a journal page, would be helpful!”
- “Thank you! Although I didn’t complete every module, from what I did do, I realized a lot of things about myself and my eating habits. I’m still having a hard time changing them but slowly I’m trying to do the little things that these modules have taught me. And for that I would like to thank you.”
- “It was a great program but I feel my emotional eating was not severe enough for this program to fully help me.”
- “I loved the advice and tips, especially the ones that made you aware of your emotions. I used to let my emotions take over me when regards to eating and now I can proudly say that I am in full control of not only my emotions pertaining to food, but also my emotions in other aspects of my life. This is a great program and really helped my become aware of a problem I didn’t think I had.”
- “I really enjoyed this program (: thank you for everything”
- “Thank you for making this program!”
- “I changed my behavior to a person who eats regular and try not to skip any meal in a day over the past few weeks after learning about the program.”
12-week comments about the program

• “Thank you so much for this program! It’s nice to know what I am not alone in struggling with emotional eating. Thank you for providing me with other outlets and for pushing me to think about the causes of emotional eating. One feedback for the journal section is it would be nice to see the prompts/questions on the journal page.”

• “This was a good tool to bring emotional eating to my awareness.”

• “The program was good, but the timing was bad because it was right before finals. When I first started the program I was doing good and then as things got busy I just gave in and did more emotional eating than before.”

• “I really liked this program”

• “I think it’s an interesting concept. I do wish I utilized it more. I think providing information is a great way to create a sense of realization within an individual, regardless of how impactful it will be. It could potentially stimulate an individual to ruminate about something.”

• “This was a very interesting study! I learned a lot about how emotions play a role in our eating habit. Good luck with the research! Please let me know how the results turn out, I am curious to find out. Thank you!”
References


Aronne, L. J. (2002). Classification of obesity and assessment of obesity-related health risks. *Obesity Research, 10* (suppl.2), 105S-115S.


