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Dynamics of Momentary Perceived Self-Regulation Abilities as Novel Predictors of Overeating in Daily Life

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Dynamics of Momentary Perceived Self-Regulation Abilities as Novel Predictors of Overeating
in Daily Life

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Abstract

Despite an increase of research in the realm of overeating - a well-known contributor to obesity - the psychological mechanisms that maintain overeating behaviors across time and context are still poorly understood. It may be that people's perceptions of their self-regulation abilities fluctuate over time, and overeating results from momentary increases in negative mood eliciting negative perceptions of their self-efficacy and current willpower, stronger beliefs that cravings can be controlled and a greater ability to tolerate distress. The current study examined the dynamics of and momentary predictors of overeating using a 7-day EMA protocol to study unsuccessful restrained eaters ($n = 94$, Mage $= 28.01$, 83.2% female) in their natural environments. Participants (1) were randomly prompted 7 times per day to assess mood, momentary perceived self-regulation abilities, and situational context and (2) initiated an event-based prompt when consuming food. Results indicated perceived self-regulation abilities varied across time and context, and mediated the relation between negative affect and overeating, such that lower levels of negative affect predicted severity of overeating via lower levels of perceived self-regulation abilities (e.g., perceptions of willpower, craving uncontrollability, distress tolerance). Craving uncontrollability and willpower emerged as distinct predictors of overeating severity among this sample. These findings provide important implications for the treatment of overeating, suggesting that treatments may be improved by addressing the role of fluctuations in perceived self-regulation abilities in predicting overeating.

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Introduction

Obesity rates among both adults and children have significantly increased over the last two decades (Ogden, Carroll, Fryar, & Flegal, 2016) and remain a significant public health concern. Despite that overweight and/or obese individuals *want* to lose weight and maintain that loss, statistics show that only 1 in every 6 Americans who have ever been overweight or obese is able to do so. Rather, the overwhelming majority of such individuals report struggles with self-regulation (e.g., one's ability to override a thought, emotion, or impulsive action; Baumeister et al., 1994) to change their eating behaviors (Kraschnewski et al., 2010). Clearly, continued work is needed to prevent obesity by addressing overeating behaviors that contribute to the development and maintenance of obesity. This work will require an interdisciplinary perspective, all the way from behavioral neuroscience (Potenza, 2014) to behavioral measures such as ecological momentary assessment (EMA) which uses mobile devices to collect momentary data from individuals who struggle with overeating as they live their daily lives. Researchers have called upon EMA to study eating behaviors, considering the relationships between psychosocial antecedents and eating behavior are thought to be complex, including interactive effects of psychological processes (e.g., emotion, self-regulation), time-lagged effects, and associations that persist for only brief periods of time (Smyth, Wonderlich, Crosby, Miltenberger, Mitchell, & Rorty, 2001). Beyond these benefits, the real-time data collection made possible by EMA minimizes retrospective reporting biases and allows for analyses of contextual factors (e.g., interpersonal stressors, exposure to palatable food) and for investigating

self-relevant cognitive processes that change across time and context, including emotion

and craving (Trull & Ebner-Priemer, 2013).

Restrained Eaters

Literature identifies restrained eaters as a specific group of individuals who appear to be at-

risk for failure in self-control (Heatherton & Wagner, 2011; Hofmann, Adriaanse, Vohs &

Baumeister, 2013; Stroebe et al., 2013). Believed to be chronic dieters or weight suppressors,

restrained eaters are assumed to cognitively manage their food intake for the purpose of weight loss

or weight control (Herman & Polivy, 1980; Burger & Stice, 2011). Unlike unrestrained eaters, who

allow internal hunger cues to regulate their food intake, restrained eaters adhere to self-set dieting

rules and are characterized by restriction in their eating habits (Herman & Mack, 1975) yet

ironically exhibit disinhibited eating behavior (i.e., overeating; Coelho, Jansen, Roefs,

& Nederkoorn, 2009). The goal-conflict model of eating behavior (Stroebe, Mensink, Aarts,

Schut, & Kruglanski, 2008) highlights a self-control dilemma that individuals with high levels

of eating restraint often experience, whereby both eating enjoyment and weight control goals are

activated when people are exposed to food temptation. Some restrained eaters are successful in

their goal of weight control, such that they are able to restrict their eating when tempted (Keller

& Siegrist, 2014); however, a subset of restrained eaters are not (referred to here as unsuccessful

restrained eaters). Unsuccessful restrained eaters are, by definition, less successful at controlling

their eating behavior despite goals for weight loss and ironically tend to overeat when tempted.

Thus, unsuccessful restrained eaters are at an increased likelihood of overeating, making them

an ideal population to study in psychological research that aims to capture natural occurrences of

overeating behavior among participants.

Self-Directed Cognition, Affect, and Eating

   Emotion and eating. There is a large body of work investigating the relation between affect and eating behavior (e.g., for review papers, see: Lavender, Wonderlich, Engel, Gordon, Kaye, & Mitchell, 2015; Leehr, Krohmer, Schag, Dresler, Zipfel, & Fiel, 2015). Recent theoretical models of eating disorders emphasize emotion dysregulation as a transdiagnostic factor across the spectrum of eating disorders (Fairburn, Cooper, & Shafran, 2003; Treasure, Corfield, & Cardi, 2012). In fact, one of the most commonly proposed explanations of overeating emphasizes negative mood as an antecedent (Wegner, Smyth, Crosby, Wittrock, Wonderlich, & Mitchell, 2001). Within this conceptual framework, overeating functions as an escape from or immediate management of negative emotions (Cheertham et al., 2010; Haed-Matt & Keel, 2012). Indeed, research indicates that among children, overeating in response to emotions (i.e., emotional eating) and overeating in response to external food-related cues is predicted by increased reactivity to anger and worry (Harrist et al., 2013), emphasizing the relation between reactivity to negative emotion and overeating behavior. For people diagnosed with binge eating disorder, evidence generally suggests that negative emotion triggers binge eating (Leehr et al., 2015), and evidence supports that all eating disorder subtypes (e.g., anorexia nervosa-restricting type, anorexia nervosa-binge/purge type, bulimia nervosa, binge-eating disorder) report greater difficulties in emotion regulation compared to healthy controls (Brockmeyer et al., 2014). Further, research indicates that for restrained eaters, overeating in response to distress may serve numerous psychological functions, including the distraction from and/or masking of distress (Polivy & Herman, 1999).

   Despite what is known about the affect-overeating relation, affect does not ubiquitously predict overeating in daily life (Haedt-Matt & Keel, 2011) and the associations between specific

forms of affect and overeating are unclear. For instance, a recent study found that fluctuations in negative emotion, emotion regulation difficulties, and the interaction between the two predicted binge eating among women, though only fluctuations in negative emotion predicted binge eating among men (Kukk & Akkermann, 2017). Additional research suggests that negative affect further *increases* following overeating episodes, which suggests that overeating may not serve the function of eliminating and/or reducing negative affect (Haedt-Matt & Keel, 2011). Beyond negative emotion, newer models specific to eating disorders incorporate the experience of positive emotions in predicting disordered eating, grounded in the idea that progress toward goals related to weight/ body shape elicits positive emotions that reward and motivate further weight-loss behaviors (Walsh, 2013). Empirical research has indicated that positive affect and negative affect may be more accurately described as bivariate rather than existing on a unipolar scale (Larsen, McGraw, & Cacioppo, 2001), suggesting that even in the context of negative affect, positive affect can simultaneously be experienced and may likewise influence behavioral outcomes. Indeed, recent work examining affective precursors to eating behavior in both laboratory settings and daily life revealed that experimentally induced positive affect triggered an increase in food consumption to the same degree of induced negative affect, and positive affect triggered increased food consumption in daily life more frequently than negative affect (Evers, Adriaanse, de Ridder, & de Witt Huberts, 2013).

Overall, it is clear that emotion contributes to overeating and other disordered eating behavior. However, this relationship is complex in that findings from this domain reveal specific and often different links between various types of affect and eating outcomes. It is unlikely that one proposed link (e.g., negative affect predicting overeating) is "correct," but rather that additional mechanisms intersect with affective processing to culminate in the patterned eating

behaviors that have, to this point, been conceptualized as direct products of an individual's emotional experience. Clinical research in the eating realm, including overeating and obesity, highlights the effectiveness of therapeutic approaches that aim to change emotional experiences indirectly via modification of cognitions and behavior (Berg et al., 2015), which suggests that cognitive processes may be one critical pathway through which affect influences eating.

Self-directed cognition and eating. How can we predict how someone will behave? Social cognitive theory (Bandura, 1986) concerns the mechanisms of behavior and behavior change, with a central focus on how an individual's experiences, the actions of other people, , and the interaction between the individual and their environment shapes their behavior. Recent years have seen a heightened interest among researchers to understand the self-directed cognitions (e.g., beliefs/perceptions about the self) implicated in social processing, and how they maintain psychological disorders Happe, Cook, & Bird, 2017). A recent review of self-directed cognitive processes and eating behavior in daily life (Skinner & Veilleux, unpublished manuscript) revealed the salient role that specific self-directed cognitions (e.g., self-beliefs, self-judgments) serve in predicting eating behavior, and reviewed research which found that negative beliefs/judgments about the self predicted increased binge eating and/or disordered eating behavior at large (e.g., Breines, Toole, Tu, & Chen, 2014; Jones, Crowther, & Ciesla, 2014). While momentary perceptions of the self indeed appear to be salient predictors of eating behavior, it is also known that self-processes are heavily influenced by additional psychosocial mechanisms, such as emotion (Bandura, 1993).

Affect and self-directed cognition. The understanding that our interpretations, self-beliefs, outcome expectancies, goal-setting, and motivation are intertwined with our affective processing is not new. Research in the last several decades has focused on three major research

issues (Forgas, 2006): (1) How can the apparent affect-congruence of many social judgments and behaviors be explained?; (2) How does affect *influence* information processing?; and (3) How do people appraise situations as an affective reaction to the situation is being formed? Past research has long indicated that different forms of affect have distinguishable cognitive and perceptual effects: some research indicates that positive affect triggers heuristic/relational processing and widened attention, while negative affect elicits systematic or elaborated processing and narrowed, focused attention (Rowe, Hirsch, & Anderson, 2007; Schwarz & Clore, 2007). However, newer work suggests conflicting evidence: positive affect may also lead to detailed processing and detailed focus, and negative affect may lead to heuristic processing and widened attention (Huntsinger et al., 2014). Additional work examining momentary distress intolerance, or an individual's perception of their ability to tolerate their feelings in the current moment, found that greater momentary distress intolerance and instability of momentary distress intolerance was associated with lower average momentary positive emotion and greater negative emotion in daily life (Veilleux, Hill, Skinner, Pollert, Baker, & Spero, 2018). As such, affect and cognition may flexibly interact depending on the momentary mental context (Huntsinger et al., 2014). Unfortunately, the majority of research on affect and cognition has not considered this and instead assumes a fixed or robust connection between specific types of affect and styles of cognitive processing, resulting in a potentially skewed and insufficient understanding of the interplay between affect and self-directed cognition in the context of eating.

Why would we expect affect to influence self-directed cognition? One basis for this prediction is the salience literature, which posits that objects that are distinctive or unexpected capture one's attention (Taylor & Fiske, 1978). Affect may follow an unexpected event and therefore may itself be unexpected, and it may be distinctive because it creates a deviation from

one's baseline state. Thus, affective experience may draw attention inward toward the self, which may then generalize into a global state of self-focused cognitions (Wood, Saltzberg, & Goldsamt, 1990). Similar research has suggested that people examine self-relevant cues, such as internal sensations and memories of past emotional experiences, to make sense of their current emotional state (Carver & Scheier, 2012). In other words, when individuals experience emotions that they do not understand, their search for an explanation may engage self-focus. This is consistent with the feelings-as-information theory (Schwarz & Clore, 1983, 2003) which posits that people attend to their momentary feelings as a source of information in forming judgments, essentially asking themselves, "How do I feel about this?'

Even more, Carver and Scheirer's (1981) model of self-regulation posits that processes of self-regulation involve comparing one's current state with a goal or standard, and if there is a discrepancy, one may either adjust their behavior to meet the standard or, if they expect to fail, abandon attempts to meet it (i.e., self-regulation failure). Indeed, affect may send the signal that something is wrong, and that one must attend to the self in order to overcome the failure or to adjust their standards. This would suggest that negative affect may indeed culminate in self-regulation failure by way of self-focused processes, including self-focused cognition. In addition, affect may activate self-regulatory processes designed to control the affect itself. Thus, while affect certainly plays a role in behaviors characterized by self-regulation failure (e.g., substance abuse, overeating), it likely is not the *sole* factor accounting for such behaviors, and the missing pieces in this relation, which may include self-directed cognition, deserve enhanced scholarly attention.

Self-Regulation Abilities and Eating

One route to a deeper understanding of the processes underlying the psychopathology of overeating is examining the cognitive mechanisms at play in the knowledge, interpretation, and regulation of thinking itself. Self-directed cognitions are emphasized in the maintenance of pathological distress (Wells & Matthews, 1994, 1996), including addictive behaviors (Spada & Wells, 2009; Spada, Caselli, & Wells, 2013; Spada et al., 2014). Within this conceptual framework of self-directed cognitive mechanisms contributing to addiction, it is understood that as people move from the initiation phase (e.g., experimenting with substance use) to maintenance (e.g., consistent patterned use along with dependence), negative cognitions about one's inability to control such behavior emerges, including thoughts about being unable to control cravings that precede engagement in the behavior (e.g., "I can't control my craving"). For example, research employing longitudinal designs has demonstrated that the downstream effects of negative self-directed cognitions are associated with alcohol abuse (Schoenmakers, Wiers, & Field, 2008), increased cannabis use in regular users (Field, Eastwood, Bradley, & Mogg, 2006) and increased tobacco use in regular users (Mogg, Field, & Bradley, 2005) and risk of relapse in alcohol abusers (Cox, Hogan, Kristian, & Race, 2002), smokers (Waters, Shiffman, Bradley, & Mogg, 2003), and illicit drug users (Carpenter, Schreiber, Church, & McDowell, 2006). Though little work has translated these findings to the domain of eating, brain imaging studies reveal neural correlates as well as similarities in reward value and inceptive value of respective stimuli in both eating disorder and substance dependent individuals (Imperatori et al., 2014), which highlights similarities in reward circuitry between both populations. Thus, addiction research may be a powerful tool for understanding the complicated nature of overeating behavior.

As is seen in addiction research, it is evident that self-regulation of emotion and behavior is implicated in overeating, and it would follow that people are more motivated to enact self-regulation when they believe they can succeed at their goals (Berli et al., 2015). Thus, it may not be that negative affect ubiquitously predicts overeating, but instead that negative affect triggers self-directed cognitions regarding one's capacity for self-regulation; that is, an individual's perception of their lack of self-efficacy to reduce food intake, their perception of their limited willpower, their momentary beliefs that food cravings cannot be controlled and a decreased ability to tolerate distress in the moment (these will be referred to as perceived self-regulation abilities when referenced in the current study). This, in turn, may limit successful coping with negative affect and would likely increase the likelihood they would fail at enacting self-control (i.e., overeat). It would follow, then, that affect plays only a part in predicting eating outcomes, with a critical role of perceived self-regulation abilities largely accounting for the patterns of eating behavior in the context of various affective states. Existing work indicates that perceived self-regulation abilities are indicative of how persistent an individual will be at engaging in self-regulation (Chavarria, Stevens, Jason, & Ferrari, 2012), and highlights an association between increases in negative affect and decreased perceived self-regulation abilities (Schlauch, Gwynn-Shapiro, Stasiewicz, Molnar, & Lang, 2013).

Extant research overwhelmingly considers self-regulation abilities to be *traits* (Brown et al., 2005; Nosen & Woody, 2009) rather than processes that shift within-individuals over time. However, budding research indicates that some perceived self-regulation abilities which are typically studied as traits actually fluctuate across time when measured via EMA, including impulsivity (Tomko et al., 2014), perceived self-efficacy in one's ability to curb food consumption (Zenk et al., 2014), self-efficacy for quitting smoking (Gwaltney, Metrik, Kahler, &

Shiffman, 2009) and distress tolerance (Veilleux et al., 2018). Here, I argue that additional work is needed to (1) reveal that processes typically viewed as traits (e.g., self-efficacy, willpower, craving uncontrollability, distress tolerance) indeed vary over time and context, which reflects the idea that people's perceptions of their own capacities likely shift over time, and (2) elucidate how self-directed cognitive processes relate to overeating.

To provide a hypothetical example, consider "Megan," a self-identified unsuccessful restrained eater who has an intense argument with her husband one night and heads to a local buffet to overindulge. She is feeling bad, and beyond that, she feels drained of willpower and feels that her distress is so strong she won't be able to take it. This differs from a day where Megan has a stressful day at work and feels bad but does not feel stripped of her willpower; on this day she feels bad but feels that she can manage her distress, and Megan does not go to the buffet on this day. Examining these self-regulation abilities as dynamic rather than traits allows for a more nuanced social-cognitive approach (Mischel & Shoda, 1995) to understanding antecedents to overeating. Considering the increased likelihood that unsuccessful restrained eaters will engage in disinhibited eating, examining this group of individuals may be ideal if the overall aim is to examine momentary perceived self-regulation abilities as precursors to overeating in daily life.

To address the proposed relationships between affect, momentary perceived self-regulation abilities, and overeating, EMA is an ideal method. Overeating often occurs in secret and is viewed as shameful, which limits the accuracy of retrospective self-report in a laboratory setting (Wittig & Wittig, 1993). Research indicates that retrospective forms of assessment may further be limited by individuals' difficulty recalling emotional experiences and behaviors accurately (Smyth, Wonderlich, Crosby, Miltenberger, Mitchell, & Rorty, 2001), such that biases

may contribute to recall difficulties, including cognitive and memory limitations, and the impact of current mental states on the ability to recall past mental states (Smyth et al., 2001; Wonderlich et al., 2015). In addition, perceived self-regulation abilities, mood, and eating behavior fluctuate significantly over time. Thus, EMA is an ideal method for studying this relation in that EMA can assess low-frequency and sensitive events that are subject to reporting biases, as well as examine temporal associations between behaviors that change rapidly over time.

The Current Study

The current study explored the dynamics of affective and momentary perceived abilities (e.g., distress tolerance, self-efficacy, craving uncontrollability, willpower) that predict overeating in daily life (i.e., using EMA). The aims of this work are (1) to establish the variability in perceived self-regulation abilities across time and context in unsuccessful restrained eaters, and (2) to examine the mediating role of momentary perceived self-regulation abilities in the relation between negative affect and overeating among unsuccessful restrained eaters in daily life. I predicted that perceived self-regulation abilities would shift over time and context, which would indicate that they may be better measured via state rather than trait measurement. I hypothesized that negative affect and momentary perceived self-regulation abilities would predict whether an eating episode would be considered "normal" or "overeating" among chronic dieters. Within overeating episodes, I predicted that momentary perceived self-regulation abilities would mediate the relation between negative affect and overeating, such that increases in negative affect would predict increased severity of overeating through lower levels of momentary perceived self-regulation abilities.

Method

Participants

A sample of 107 participants categorized as unsuccessful restrained eaters were recruited from an undergraduate psychology subject pool ($n = 61$) and the local community ($n = 46$). Participants attended two laboratory sessions and one week of EMA in between. In attempts to broaden the sample to include individuals older than a typical undergraduate population, community participants were recruited only if they were at least 25 years of age. Self-report measures of food restraint were used to screen all participants. Researchers typically measure restraint via the Revised Restraint Scale (RRS; Herman & Polivy, 1980) and the Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985); however, recent work (Pollert, Skinner, & Veilleux, under review) highlights key differences between both measures, such that the RRS assesses dieting with episodes of food restriction paired with disinhibited eating (Heatherton, Herman, Polivy, King, & McGree, 1988), whereas the TFEQ measures more consistent and successful instances of food restriction (Stice, Fisher, & Lowe, 2004). Considering the overall aim of the current study was to recruit people at risk for failure in self-control of eating (i.e., unsuccessful restrained eaters), the RRS was used to recruit unsuccessful restrained eaters.

All potential participants completed a set of screening measures to determine eligibility, which included the Revised Restraint Scale (Herman & Polivy, 1980) and questions asking about food allergies/restrictions and eating disorder history. Subject pool participants completed this screening online as part of a department wide screener administered at the beginning of the semester, and community participants completed the same screening questions via Google Survey online. Only unsuccessful restrained eaters (i.e., RRS score of 16 or above) were

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considered for the current study. Individuals were excluded due to any medical illness requiring diet modification (i.e., which may influence eating episodes), current medication usage associated with increased amount and/or frequency of food consumption, current psychosocial treatment for an eating disorder (e.g., individual/group psychotherapy, nutrition counseling), and inability to read English. Only individuals who reported they had an IPhone or Android and would be willing to download a study-specific phone application for one week were considered for this study

Individual Difference Measures

Participants reported on demographic variables and responded to questions asking about current and past dieting behaviors (e.g., "Was your last diet attempt: (a) within the last 30 days, (b) within the last 6 months, (c) more than 6 months ago?" "How long were you able to maintain your diet? (a) Less than 24 hours, (b) 24-48 hours, (c) between 2 days and 1 week, (d) 1 week to 1 month, (e) 1 month to 1 year, (f) more than 1 year?"), dieting intentions (e.g., "Do you have plans to lose weight by reducing food intake (e.g., dieting)? (a) Will start diet in the next month, (b) will start diet in the next 6 months, (c) may diet in the future, but not in the next 6 months, (d), and motivations for dietary change (e.g., "How important is it that you change your diet: (a) to lose or control weight? (b) To control an existing medical problem? (c) So that you feel better about yourself?").

The *Distress Tolerance Scale* (DTS: Simons, Gaher, 2005) is a 15-item self-report measure of perceived distress tolerance including the ability to tolerate emotional distress (e.g., I can't handle feeling distressed or upset), subjective appraisal of distress (e.g., My feelings of distress or being upset are not acceptable), attention being absorbed by negative emotions (e.g., When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually

feels), and regulation efforts to alleviate distress (e.g., When I feel distressed or upset I must do something about it immediately). Items are rated on a five-point Likert-type scale from 1 (*strongly* agree) to 5 (*strongly disagree*) and demonstrated adequate internal consistency in the current study ($\alpha = .89$)

The *Depression Anxiety Stress Scale* (DASS-21; Henry & Crawford, 2005) is a 21 item self-report scale measuring anxiety, depression, and stress. A total score reflects the degree to which an individual is experiencing general psychological distress. The items are measured on a 0 *(did not apply to me at all)* to 3 *(applied to me very much, or most of the time)* scale. Internal consistency of scale items was high for the current study ($\alpha = .92$).

The *Emotion and Regulation Beliefs Scale* (ERBS; Veilleux et al., 2015) is a 21-item self-report questionnaire measuring beliefs about the nature of emotions; specifically, the belief that emotion constrains behavior (emotion constraint subscale; $\alpha = .76$), that emotion regulation is a worthwhile pursuit (regulation worth subscale; $\alpha = .82$), and that emotions can take over self-control (hijack subscale; $\alpha = .64$). Responses range from 1 (*strongly disagree*) to 5 (*strongly agree*).

The *Metacognitions about Desire Thinking Questionnaire* (MDQ; Caselli & Spada, 2013) assesses meta-cognitions (i.e., thinking about thinking) related to desires. This 18-item scale is essentially an implicit beliefs measure, assessing whether desired thinking is construed as positive (positive metacognitions subscale; $\alpha = .83$), negative (negative metacognitions subscale; $\alpha = .82$), or bad for one's self-image and should be controlled (need to control metacognitions subscale; $\alpha = .70$). Items are rated on a 4-point Likert type scale, from 1 (*do not agree*) to 4 (*agree very much*).

The *Binge Eating Scale* (BES; Gormally et al., 1982) is a 16-item measure that assesses binge-eating severity. Responses reflect the participant's behavioral, cognitive and emotional experiences surrounding a binge episode. The items are rated on a 3-point Likert-type scale (α = .78) from 0 (*no binge eating problems*) to 3 (*severe binge eating problems*), except for items 6 and 16 which are rated on a 3-point Likert-type scale from 0 (*no binge eating problems)* to 2 (*severe binge eating problems)*.

Participants completed additional measures which were not described here, as they were not relevant to analyses presented here. The full list of measures can be requested via email if desired.

Ecological Momentary Assessment Measures

Participants completed the daily ratings portion of the study for 7 days between the baseline and debriefing laboratory sessions. Three types of data were collected for the same 7-day period: 1) random reports (notifications at random times to assess mood, perceived self-regulation abilities), 2) event-based reports (when the participant consumed any type of food, they were trained to initiate a report), and 3) bedtime reports (retrospectively reporting on current day's eating episodes and the most stressful event they experienced, difficulties they experienced with the cell phone application and/or completing prompts, and whether they predicted they would overeat the following day). Random prompts occurred 7 times per day during waking hours (between 9am – 10pm), and participants were instructed to respond to a prompt within five minutes or else the prompt was considered "missed." All EMA items are listed in Appendix A.

Random prompts

Affect & Craving. A subset of emotional adjectives from the PANAS-Expanded Form (Watson & Clark, 1999) was used for participants to report the degree to which they felt

momentary positive (e.g., happy, excited, at ease, calm) and negative affect (e.g., sad, guilty, lonely, dissatisfied with self). Additional items assessed craving (e.g., "Right now, my craving to eat is ___"), hunger ("Right now, I am ___ hungry") and tiredness ("Right now, I am ___ tired"). Affect, hunger, and tiredness items were rated on a 6-point Likert-type scale, ranging from 0 (*not at all*) to 6 (*extremely*), and craving questions were rated on a visual analogue scale from 0 (*zero*) to 100 (*extreme*).

    Momentary Perceived Self-Regulation Abilities. Items were adapted from existing trait measures to reflect momentary abilities (e.g., momentary willpower, self-efficacy, distress tolerance, and craving uncontrollability). Our laboratory had already developed and validated a 3-item momentary measure of perceived momentary distress tolerance (example item: "I'll do anything to stop feeling how I am feeling right now"; Veilleux et al., 2018), and a 2-item measure of momentary willpower (e.g., "If I had to do a task right now that required significant willpower, I would be successful at that task"; Veilleux et al., under review), both of which were used in the current study. Additional items were included to assess subjective ability to control cravings (e.g., "I don't have any control over my current craving.") and self-efficacy (e.g., "Right now I believe I can overcome any challenges that might make me want to eat more food than I would like."; adapted from Gwaltney et al., 2009). Participants rated the degree to which they agreed with the statements on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

    Situation. Participants also responded to a series of questions regarding their current physical location (e.g., home, work, restaurant), activity (e.g., working, exercising, interacting with others, inactive; Garrison et al., 2015), who the person was with, if there was food in the location, and if others were eating in the participant's presence, and if the participant had

consumed alcohol, caffeine, or experienced a significant stressor since the last prompt. These situational variables did not address the primary aims of the study, but allowed for a basic assessment of situational context for secondary analyses.

Event-based prompts

Participants were trained to log meal and snack eating events (i.e., estimated caloric intake as they consumed it) immediately following consumption and indicated the extent to which they felt they had overeaten, and (2) whether they had experienced a subjective loss of control over their eating; this is one of the main criteria for a binge eating episode (APA, 2013). These logged prompts also included all items assessed at the random prompts, including emotion, perceived self-regulation abilities, and situation variables. Of note, there was some invariability in the measures between the random and eating prompts due to the wording of items. At eating-initiated prompts, participants were asked to report on their experiences *immediately before eating,* while at random prompts they were asked to report on their experiences *right now*.

Bedtime prompt

 Participants reported on any omitted eating episodes that occurred during the day, as well as issues that arose with responding to the prompts. Participants also reported on the most stressful event that occurred during the day, rating how intense the event was, their emotional experience at the peak of the stressful situation, and how they tried to regulate their emotions to manage their feelings about the stressful event. Participants also reported whether they predicted they would overeat the following day. Data gathered during bedtime prompts were not analyzed for the current study.

Procedure

Participants attended two laboratory sessions (baseline, follow-up) with a 7-day period of EMA in between. At baseline, participants provided informed consent as approved by the university's institutional review board. Participants next completed a battery of self-report measures to assess individual differences in self-regulation beliefs, eating behaviors, and mood, as well as a series of laboratory distress tolerance tasks which were not analyzed here. Participants were then guided to download the LifeData application (LifeDataCorp, Marion, Indiana) to their cell phone and were given a study-specific code to access the study protocol. Participants were trained on this application (e.g., how to respond to random prompts and how to log eating events), informed of the compensation structure (e.g., payment/credit granted is pro-rated based on compliance) and any remaining questions were answered.

Participants completed 7 days of EMA, and were then scheduled for a session for debriefing where they received compensation. For subject pool participants, compensation for fully completing the study was 4 credits, including 1 for the initial orientation session with the individual difference measures and 1 for the follow up session. EMA credit was given in a pro-rated fashion, such that they received 2 credits for completing at least 80% of the prompts. They received fewer credits for completing less of the prompts (e.g., 1.5 credits for completing between 65-80% of the prompts, 1 credit for completing between 40-65% of the prompts, and .5 credits for completing between 1 and 40% of the prompts). This compensation structure incentivized participants to complete the prompts, while also providing them with credits approximately equal to the time spent on the tasks (where .5 credits is about 30 minutes of participation). Community participants received up to $80 for completion of at least 80% of

prompts (similarly pro-rated based on compliance, which is standard protocol in EMA studies; Fred Wen, Schneider, Stone, & Spruijt-Metz, 2017).

Analytic Strategy

Initial analyses were first conducted on missing prompts to determine that participant compliance was adequate. I then examined the demographics for participants. The overall sample was first examined, and secondary analyses compared college students and community participants via chi-square and *t*-tests to examine differences in age, gender and ethnicity. As the current work was dedicated to better understand the dynamics of affect, momentary self-regulation, and overeating among chronic dieters as a whole rather than based on age/demographics, the groups were pooled together for all subsequent analyses.

I then reviewed logged eating events and classified eating behavior as overeating or normal eating using participant ratings of the extent to which they felt they had overeaten on a 5-point Likert scale from 1 (*not at all*) to 5 (*extremely*). Episodes that were rated as ≥ 3 were classified as episodes of overeating, consistent with previous research (Berg et al., 2014). Overeating episodes were further broken down into overeating episodes involving loss of control or not involving loss of control, similarly based off participant ratings of the extent to which they felt they had experienced loss of control over eating on a 7-point Likert scale from 0 (*not at all*) to 6 (*extremely*). Episodes that were rated as ≥ 4 were classified as loss of control overeating episodes.

Next, I calculated person-level average levels of positive affect, negative affect, momentary distress intolerance, willpower, self-efficacy, and craving uncontrollability per individual but aggregating across all time points. Correlations were calculated between trait self-regulation measures and aggregated levels of momentary perceived self-regulation abilities as an

indication of validity that perceived self-regulation abilities measured at the momentary level indeed map onto the general constructs assessed at the trait level. Correlations were also calculated between momentary variables. Then, I evaluated the internal consistency of the momentary self-regulation ability measures using both inter- and intra-individual covariance matrices (Muthén, 1997).

To evaluate if the momentary perceived self-regulation abilities varied over time, I used mean-squared successive difference to capture variability and instability. The MSSD is the average of the squared difference between successive observations and accounts for variability over time as well as temporal dependency (Jahng et al., 2008). I first calculated a daily MSSD for each person per study day, adjusting for unequal time intervals due to the random prompt schedule (Jahng et al., 2008), and then an average daily MSSD score to arrive at an overall study MSSD for each person. If the momentary perceived self-regulation abilities are random and from an underlying normal distribution, the average MSSD score is 2, and large values of MSSD indicate excessive fluctuations and variability among scores (von Neumann, Keny, Bellinson, & Hart, 1941). In addition, Variability in each of the perceived self-regulation abilities assessed in this study was evaluated via simple random effect linear models, which assess how much individuals vary overall in their momentary perceived self-regulation abilities.

The overall statistical plan to analyze major hypotheses involved the use of multilevel modeling to capture the fact that momentary perceived self-regulation abilities and negative affect (level 1) are nested within individuals (level 2) over time; an analysis plan that can also handle random missing data and measurements taken with different time intervals, which are common in EMA. Analyses were conducted using version 3.1.0 of the *R* statistical computing environment (R development core team, 2007). Version 1.1.6 of the lme4 package, which

provides functions for fitting and analyzing linear, generalized linear, and nonlinear mixed models, was used in the primary analysis. Effect sizes for linear mixed models are expressed in terms of unstandardized *B's* and standard errors (*SE*). All variables and residuals were examined for normality. Skewness and kurtosis were within acceptable limits for each variable included in the models.

All analyses predicting an eating outcome were conducted using eating-initiated prompts only. A series of multilevel logistic regression analyses were first examined to evaluate affect and momentary self-regulation abilities as predictors of overeating vs. normal eating. An initial model was run with only negative affect as a predictor. Subsequent models evaluated each specific self-directed cognition along with negative affect to examine the unique effects of self-directed cognition with negative affect in the model.

Additional models examined momentary perceived self-regulation abilities and negative affect as predictors of overeating severity. As individuals were expected to vary on their mean levels of momentary reports (level 1), random intercepts were specified in all models to account for individual differences in overall overeating severity. Intercepts were free to vary across all participants.

Multilevel mediation analysis modeling was used to evaluate the mediating role of momentary perceived self-regulation abilities in the relation between negative affect predicting overeating among unsuccessful restrained eaters (see Figure 1). Each participant was assessed on each variable over time and can be conceived as having their own mediation effect. All variables included in analyses were person-mean centered prior to analyses, consistent with the approach outlined by Bolger and Laurenceau (2013). This approach allows for an estimation of

an average within-person mediated effect with between-person differences removed from analysis.
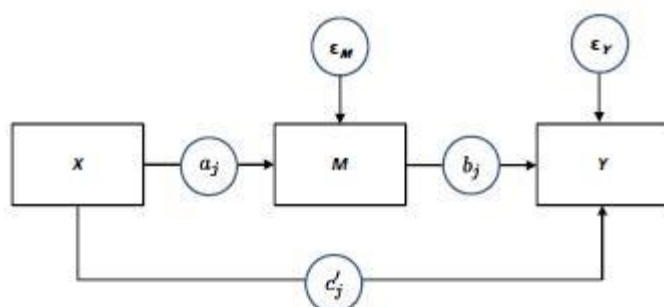
Figure 1. Momentary perceived self-regulation abilities mediation

Level 1 Equations: Yij = d0j + cjXij + eij; Mij = d1j + ajXij + vij; Yij = d2j + c'j Xij + bjMij + wij
Level 2 Equations: cj = c + u0j; aj = a + u1j; bj = b + u2j; c'j = c' + u3j
+ X = NA, M = Perceived self-regulation abilities; Y = Overeating, a/b/c = person-level average, with u's representing the deviation for that person from their specific average

Note. Figure and equations adapted from *Intensive Longitudinal Methods* (p. 181) by Niall Bolger and Jean-Philippe Laurenceau, 2013, New York, NY: The Guilford Press

Results

Demographics

Although the initial sample included 107 participants, after evaluating response rates for the daily prompts I excluded 13 people with a response rate of less than 50%, as these participants did not adhere to the EMA protocol. The final sample ($n = 94$, 83.2% female, Mage = 28.01, 77.8% White) had a response rate of 79.2% for daily prompts (see Table 1), with no demographic differences between those excluded and those retained in the final analysis. Additional analyses compared characteristics of college student participants and community participants. The community sample was significantly older than the college students, as expected, and had a higher response rate for daily prompts. There were no significant

differences in trait-level restrained eating between college and community participants. As the function of this study was to examine emotional dynamics and perceived self-regulation abilities in unsuccessful restrained eaters regardless of age/demographic, all participants were pooled together in subsequent analyses.

Table 1. *Characteristics of overall sample*

	M (SD)
Response Rate	79.19 (10.75)
Age	28.00 (11.38)
TFEQ – Cognitive	51.94 (33.28)
TFEQ_Emotional	40.46 (37.49)
TFEQ_Uncontrolled	85.16 (25.72)
RRS	19.33 (4.54)
Daily Restraint	3.93 (1.40)
% Female	81.8%
% Caucasian	76.0%

Note: Significant differences identified with different superscripts; TFEQ = Three Factor Eating Questionnaire (Stunkard & Messick, 1985); RRS = Revised Restraint Scale (Herman & Polivy, 1980); Daily Restraint = # of times intentionally restricting food/eating each day (individual difference measure)

Restrained Eating and Dieting History

I first examined characteristics of dieting history among study participants to confirm the intended sample of chronic, unsuccessful dieters was obtained. The majority of participants ($n = 78$) reported they were "starting to think about how to change my eating patterns" or were actively taking action to diet. At the time of the baseline laboratory session, 64% of participants reported they were currently on a diet, and an additional 25.8% of participants stated they planned to start dieting in the next month. Further, 94.5% of participants endorsed a history of attempting to lose weight by dieting, and 72.1% of participants reported they had done so more than 3 times in the past. Regarding last diet attempt, 66.67% of participants' last attempts occurred less than 6 months prior to the study. The majority of participants described their most successful diet attempt as being short lived; 87.2% of participants stated they were able to

maintain their diet for less than one year. Taken together, findings indicate the obtained sample was indeed comprised of unsuccessful, chronic dieters.

Eating Episodes

On average, participants logged 12.35 eating events during the 7-day EMA portion of the study; there were 1186 total logged eating episodes for the entire sample. The average estimated caloric intake participants self-reported during eating episodes was 468.61 (SD = 294.62). Of the logged eating events, 24.03% (n = 285) were characterized as "overeating episodes" and 76% (n = 151 episodes) were perceived as involving moderate to extreme sensations of loss of control. Of the 285 overeating episodes, 36.49% involved moderate to extreme sensations of loss of control (n = 104). Nearly half of participants (n = 44; 46.81%) endorsed at least 1 episode involving loss of control and overeating, and the majority of participants (n = 71; 75.53%) endorsed at least 1 overeating episode. The average caloric intake during overeating episodes was 609.84 (SD = 335.74). The average caloric intake during overeating episodes involving moderate to extreme loss of control was 655.67 (SD = 407.64).

Perceived Self-Regulation Abilities

To capture temporal instability of momentary perceived self-regulation abilities and negative affect, average daily mean-squared successive difference (MSSD) scores were calculated after adjusting for unequal time intervals due to the random prompt schedule (Jahng et al., 2008). Values greater than 2 are considered indicative of excessive fluctuations and variability among scores (von Neumann, Keny, Bellinson, & Hart, 1941). Due to short time periods between eating events and random prompts, MSSD scores were calculated using random prompt assessments only. Results indicated great variability and instability in self-efficacy (MSSD = 4.0, SD = 6.25) and craving uncontrollability (MSSD = 4.25, SD = 5.05), moderate

fluctuations in willpower (MSSD = 1.89, *SD* = 2.04), distress intolerance (MSSD = 1.73, *SD* = 1.67), and positive affect (MSSD = 1.45, *SD* = 1.36), and small fluctuations in negative affect (MSSD = .75, *SD* = .81) over time.

Zero-order correlations of average-person-level variables are reported in Table 2. There was no evidence of multicollinearity, indicating these variables captured distinct processes. MSSD's of negative affect, willpower, self-efficacy, and distress intolerance were correlated, suggesting people who vary in their negative affect also vary in these perceived self-regulation abilities. Interestingly, MSSD's of positive affect and craving uncontrollability were correlated with one another, but neither were correlated with MSSD of negative affect. Findings also indicated people who reported higher average levels of daily negative affect also reported greater variability in negative affect, lower positive affect, lower average willpower and greater variability in willpower, lower daily self-efficacy and greater variability in self-efficacy, lower perceived ability to control food cravings, lower distress tolerance, and greater variability in distress tolerance.

Table 2. *Correlations between averaged daily variables and MSSD of momentary variables*

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	Average Daily Negative Affect	--										
2.	MSSD of Negative Affect	.07*	--									
3.	Average Daily Positive Affect	-.41**	-.04	--								
4.	MSSD of Positive Affect	.04	.07	.01	--							
5.	Averaged Daily Willpower	-.30**	-.03	.34**	-.05	--						
6.	MSSD of Willpower	.07*	.99**	-.04	.07	-.04	--					
7.	Average Daily Self Efficacy	-.24**	-.01	-.19**	.02	.46*	-.01	--				
8.	MSSD of Self Efficacy	.09*	.27**	-.04	.18**	-.11**	.27**	-.05	--			
9.	Average Daily Craving uncontrollability	.26**	-.03	-.09**	-.01	-.46**	-.03	-.34**	.05	--		
10.	MSSD of Craving uncontrollability	.00	.04	.01	.48**	-.01	.03	.04	.26**	.01	--	
11.	Average Daily Distress Intolerance	.54**	.10**	-.36**	.06	-.43**	.10**	-.27**	.06	.33**	.07	--
12.	MSSD of Distress Intolerance	.07*	.99**	-.04	.07	-.03	.99**	-.01	.27**	-.03	.04	.10**

p < .05, ***p* < .001

Correlations between trait self-regulation measures and aggregated (averaged over time, for each person) levels of momentary perceived self-regulation abilities were analyzed as an indication of validity that perceived self-regulation abilities measured at the momentary level indeed map onto the general constructs assessed at the trait level. Trait level distress tolerance, general distress, binge eating, beliefs that emotions hijack behavior, negative metacognitions about desires, and greater beliefs about the need to control desire related thoughts were all significantly associated with momentary distress intolerance, self-efficacy, craving uncontrollability, and willpower. MSSD's of distress intolerance, self-efficacy, willpower, and negative affect were all positively correlated with general distress. Variability in self-efficacy and craving uncontrollability negatively correlated with trait-level distress tolerance, and variability in self-efficacy positively correlated with trait beliefs that emotions hijack behavior (See Table 3). The only associations that were not significant were the relations between trait beliefs that emotions hijack behavior and momentary craving uncontrollability and beliefs about willpower.

Table 3. *Correlations between trait and person-level variables.*

	Averaged Momentary Variables					MSSD Variables				
	MDIS	SE	Crave	Willpower	Neg Affect	MSSD MDIS	MSSD SE	MSSD Crave	MSSD WP	MSSD Neg Affect
1. DTS	-.21**	.13**	-.12**	.20**	-.23**	-.06	-.13**	-.08*	-.06	-.06
2. DASS	.21**	-.14**	.16**	-.10**	.38**	.08*	.16**	.03	.08*	.08*
3. BES	.21**	-.22**	.21**	-.18**	.22**					
4. ERBS Hijack	.05**	.04*	.02	.03	.06**	.04	.09*	.00	.04	.04
5. MDQ Negative	.22**	-.05*	.15**	-.16**	.22**	.05	-.00	.04	.05	.05
6. MDQ Control	.11**	.001	.14**	-.04*	.10**	.01	-.04	-.01	.01	.01

$*p < .01$, $**p < .001$.

DTS = Distress Tolerance Scale; MDIS = Momentary Distress Intolerance; SE = Self Efficacy; DASS = Depression, Anxiety, Stress Scale; BES = Binge Eating Scale; ERBS Hijack = Emotion Regulation Beliefs, Hijack Subscale; MDQ = Metacognitions about Desire Questionnaire, Negative Metacognitions and (need to) Control Desire Thoughts Subscales; MSSD = Mean Squared Successive Difference

Next, I evaluated the internal consistency of the momentary self-regulation ability measures using both inter- and intra-individual covariance matrices (Muthén, 1997). To calculate within-individual correlations, a discriminant function analysis was conducted with items from each momentary measure, which calculates the pooled within-group correlation and covariance matricies. Correlations at the between and within-subjects level between scale items were comparable. I evaluated the applicability of these data to multilevel analysis by examining intraclass correlations (ICCs) of momentary distress intolerance, self-efficacy, willpower, and craving uncontrollability, which delineates the percentage of the total variance in each momentary measure that is due to mean differences between subjects. ICCs were calculated using an approach outlined by Bolger & Laurenceau (2013), which entailed running a null (random intercept only) 2-level model with repeated measurements at Level 1 and participant at Level 2. As stated by Bolger and Laurenceau (2013), ICCs typically range between .2-.4 for intensive longitudinal data, and will be above 0 if the measures demonstrate intra-individual differences. All ICCs were above zero, ranging between .20 and .51), and importantly each was above .10, the threshold suggested for using in multilevel modeling (Muthen, 1997).

Next, random effect linear models evaluated variability among momentary perceived self-regulation abilities. Variance component estimates indicated that individuals vary 46.48% in their perceptions of momentary distress intolerance ($SE = .07$, Wald Z = 6.56, $p < .001$), 64.60% in their willpower ($SE = .10$, Wald Z = 6.61, $p < .001$), 48.08% in their craving uncontrollability ($SE = .08$, Wald Z = 6.32, $p < .001$), and 85.69% in their perceived self-efficacy ($SE = .13$, Wald Z = 6.51, $p < .001$) when randomly assessed. These analyses suggest that nearly half of the variability in perceived distress tolerance and craving uncontrollability is within subject, and the majority of the variability in willpower and self-efficacy in particular is within subject; people

report significant changes in their self-regulation perceptions over time, with remarkable changes found in perceptions of momentary willpower and self-efficacy.

The same analyses were repeated at eating prompts only to examine variability in perceived self-regulation abilities across eating episodes. Variability component estimates of momentary distress intolerance and self-efficacy were comparable at eating prompts vs. at random times; however, estimates indicated that individuals vary 74.19% in beliefs about craving uncontrollability ($SE = .14$, Wald $Z = 5.38$, $p < .001$), and 89.20% in perceptions of willpower ($SE = .15$, Wald $Z = 6.13$, $p < .001$) across eating episodes. This suggests that individual's momentary perceptions of their ability to manage cravings and of their willpower are more likely to shift when eating than at random times. Importantly, variance component estimates represent variability or the general dispersion of scores but does not take into account the sequence or the order of these processes over time (Jahng, 2008).

Risk of Overeating

A series of multinomial logistic regression models were used to examine the association between negative affect, momentary self-regulation abilities, and type of eating episode (overeating vs normal eating). The first model evaluating negative affect as a predictor of overeating was significant, $\chi^2 (1, N = 1186) = 78.32$, Nagelkerke $R^2 = .10$, $p < .001$. Increased momentary negative affect (OR = 1.95, CI = 1.67 – 2.26) was associated with increased risk of having an overeating episode. The second model evaluating negative affect and craving uncontrollability as predictors was significant, $\chi^2 (2, N = 1183) = 145.47$, Nagelkerke $R^2 = .17$, $p < .001$. Increased momentary negative affect (OR = 1.679 CI = 1.43 - 1.96) and increased craving uncontrollability (OR = 1.43 CI = 1.31 - 1.56) were associated with increased risk of overeating. The third model evaluating negative affect and momentary distress intolerance was

significant, χ^2 (2, N = 1185) = 103.39, Nagelkerke R^2 = .13, $p < .001$. For each 1 unit increase in momentary distress intolerance, participants were 1.42 times more likely to have an overeating episode (CI = 1.18 – 1.70). Momentary negative affect did not increase the odds of overeating.

The fourth model evaluating negative affect and momentary willpower was significant, χ^2 (2, N = 1184) = 155.95, Nagelkerke R^2 = .19, $p < .001$. Decreased willpower was associated with increased risk of having an overeating episode (OR = .56, CI = .48 - .66). Momentary negative affect did not increase odds of overeating.

Multilevel Models Predicting Overeating Severity

An initial unconditional growth model was created to evaluate whether momentary negative affect predicted severity of overeating without considering the influence of momentary perceived self-regulation abilities. Findings indicated negative affect was significantly associated with increased overeating severity, B = .26, SE = .05, t = 4.83, $p < .001$. I next constructed a series of multilevel models predicting overeating. Separate models were run with negative affect and each perceived self-regulation ability. Results can be found in Table 4. In the three models, each perceived self-regulation ability (craving uncontrollability, momentary distress intolerance, willpower) directly predicted overeating severity ($p < .001$ for craving uncontrollability/willpower, p = .002 for distress intolerance). Negative affect emerged as marginally indicative of overeating severity in the model with craving uncontrollability (p = .05) and willpower (p = .08); negative affect did not predict overeating with distress intolerance in the model.

Table 4. *Multilevel models predicting overeating severity*

Predictor	B (SE)	t	p
Negative Affect (NA) Alone	.26 (.05)	4.83	< .001
Negative Affect (NA)	.17 (.08)	2.01	.05
Craving uncontrollability (CC)	.16 (.03)	5.72	< .001
Negative Affect (NA)	.13 (.11)	1.13	.26
Distress Intolerance (DI)	.14 (.04)	3.21	.002
Negative Affect (NA)	.20 (.11)	1.77	.08
Willpower	-.24 (.04)	-6.74	< .001

*p < .05, **p < .001

Perceived Self-Regulation Mediating the Affect-Overeating Relation

A series of multilevel mediation analyses were conducted with negative affect as X, overeating severity as Y, and each momentary perceived self-regulation variable as M. Each analysis controlled for the other self-regulation variables in the model. Findings indicated momentary willpower partially mediated the relationship between momentary negative affect and overeating severity (see Figure 2). For the typical chronic dieter, there was clear evidence that greater momentary negative affect predicted lower perceived willpower ($t = -3.46$, $p = .001$). Lower perceived willpower was also a significant predictor of greater overeating severity ($t = -8.32$, $p < .001$). A significant direct effect was found of momentary negative affect on overeating severity ($t = -2.09$, $p = .04$). The indirect effect accounted for 43.11% of the total effect and was also significant; confidence intervals were obtained using Monte Carlo method for assessing multilevel mediation (indirect effect = .10, CI = .08, .17).

Figure 2. *Willpower mediates the negative affect-overeating severity relation*

*p < .05, **p < .001

All coefficients are unstandardized

Results indicated momentary distress intolerance partially mediated the relationship between momentary negative affect and overeating severity (see Figure 3). Greater momentary negative affect was associated with higher momentary distress intolerance ($t = 8.56$, $p < .001$). Greater distress intolerance was also indicative of greater overeating severity ($t = 2.87$, $p = .006$). The direct effect between momentary negative affect and overeating severity was significant ($t = 2.28$, $p = .03$). The indirect effect accounted for 21.21% of the total effect and was significant; indirect effect = .07, CI [.03, .11].

Figure 3. *Distress Intolerance mediates the negative affect-overeating severity relation*

p < .05, **p* < .001

All coefficients are unstandardized

Findings revealed craving uncontrollability partially mediated the relationship between momentary negative affect and overeating severity (see Figure 4). Greater momentary negative affect predicted lower perceived ability to control craving ($t = -4.85$, $p < .001$). Lower perceived ability to control craving predicted greater severity in overeating ($t = -5.58$, $p < .001$). The direct effect between momentary negative affect and overeating severity was also significant ($t = 2.95$, $p = .004$). The indirect effect accounted for 27.99% of the total effect and was also significant; indirect effect = .06, CI [.04, .10].

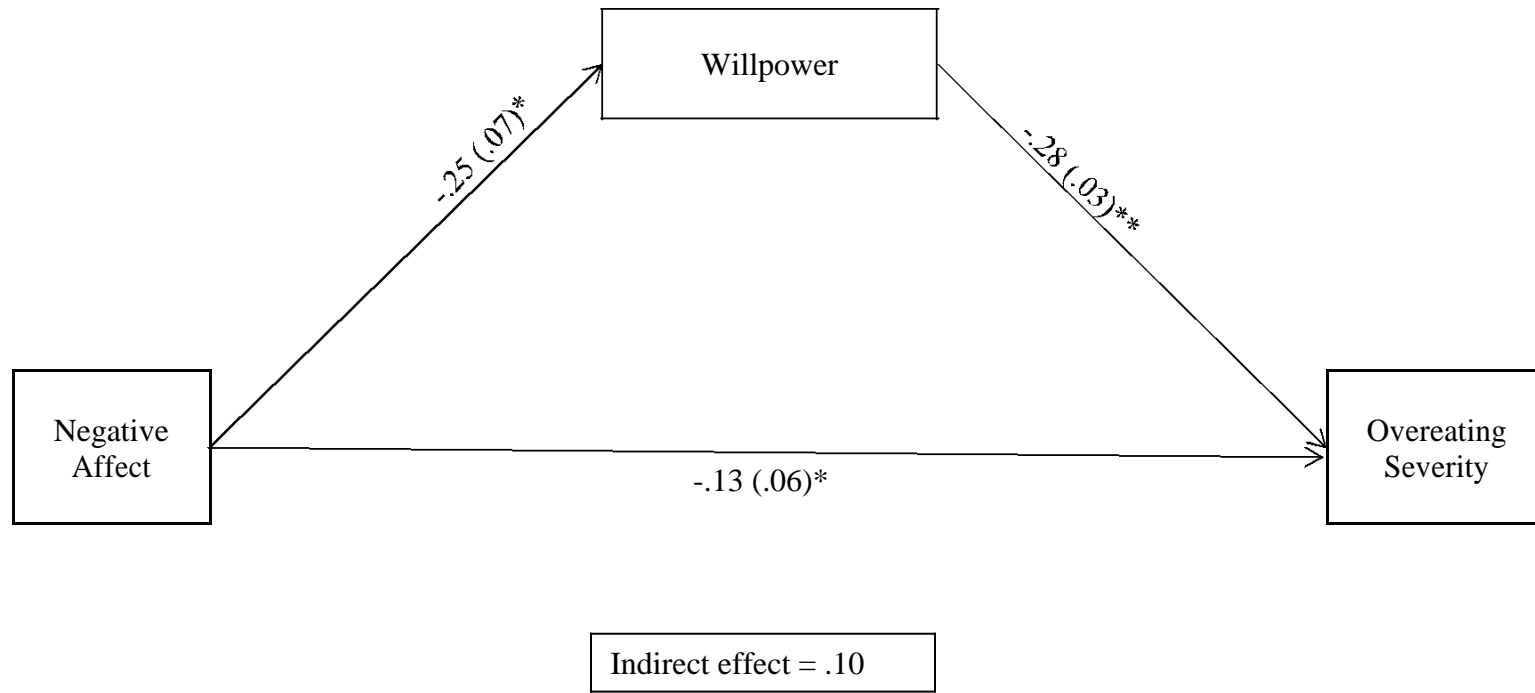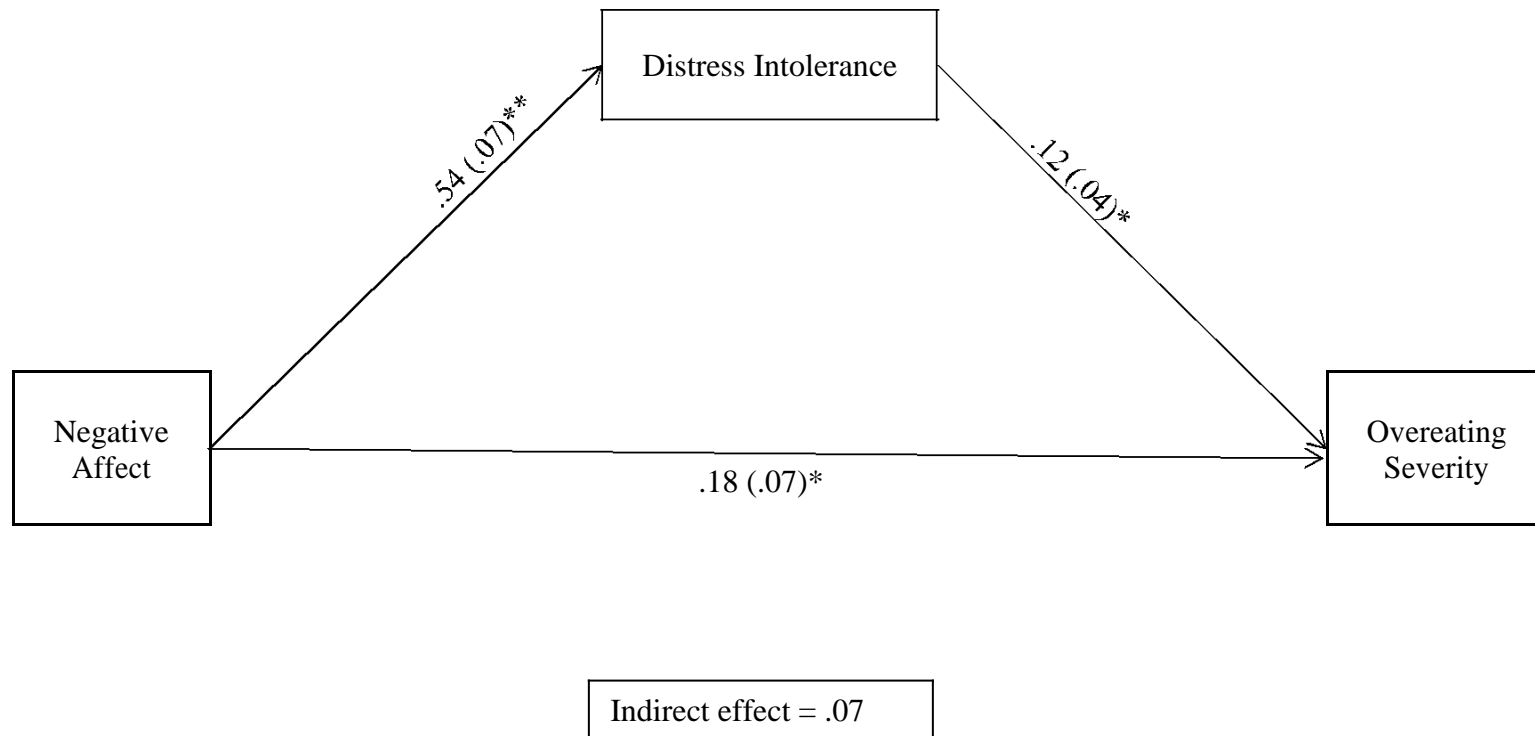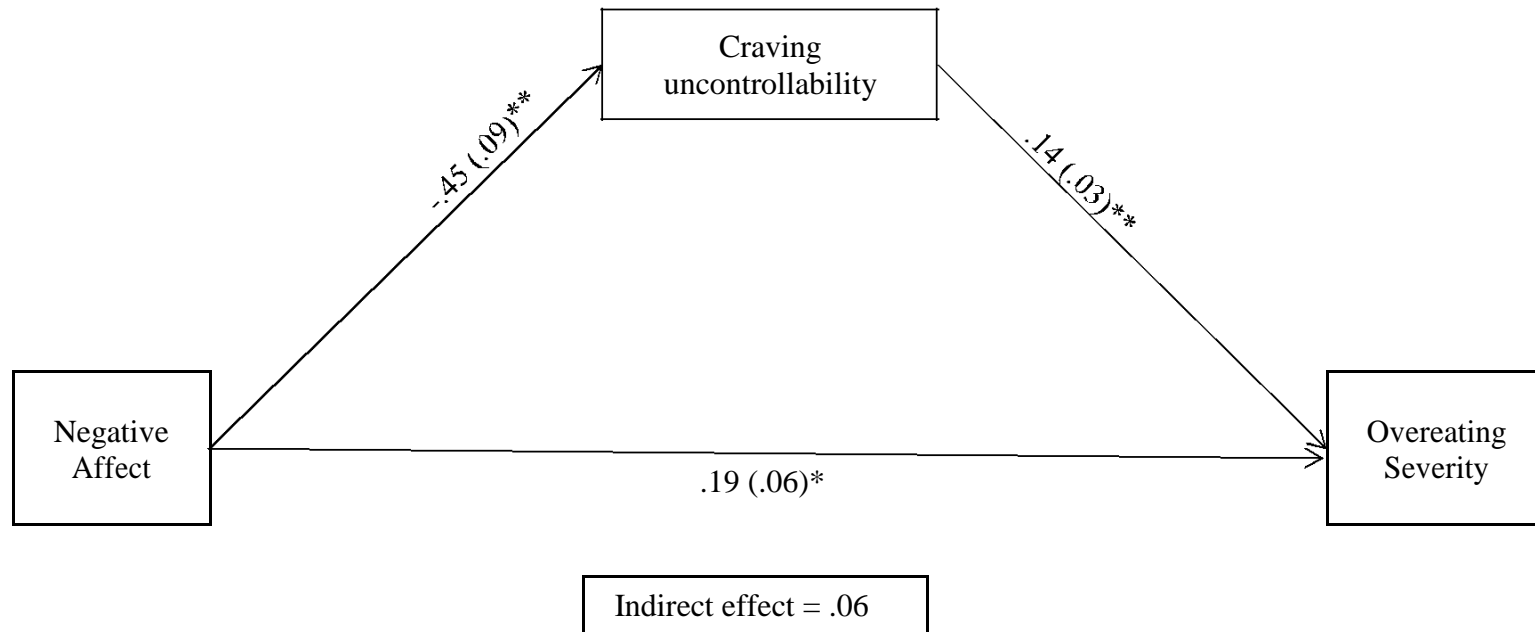Figure 4. *Craving uncontrollability mediates the negative affect-overeating severity relation*

*p < .05, **p < .001

All coefficients are unstandardized

Discussion

The current study explored the dynamics of affective and momentary perceived self-regulation abilities related to overeating behavior in daily life among chronic dieters. The aims of this work were to establish the variability in perceived self-regulation abilities across time and context in this population, and to examine the mediating role of momentary perceived self-regulation abilities in the relation between negative affect and overeating among this population. This study builds on previous work that has established the association between negative affect and overeating by also examining the role of nuanced self-directed cognitive processes (e.g., momentary perceived self-regulation abilities) as dynamic constructs in this relation. To my knowledge, research investigating the interplay between momentary perceived self-regulation abilities and affect in predicting overeating has yet to be conducted, making this work novel and imperative to furthering our understanding of psychosocial determinants of overeating in daily life.

As expected, self-regulation abilities did fluctuate over time, indicating they are likely better measured via state rather than trait measurement. Perhaps more interesting, however, is that there were *greater* fluctuations and instability among perceived self-regulation abilities than momentary negative affect among chronic dieters. This finding is important, as a host of existing theories (e.g., Cheertham et al., 2010; Fairburn et al., 2003; Treasure et al., 2012) conceptualize eating to be an affect regulatory strategy. To be clear, this is not to say that negative affect does not fluctuate and/or influence eating; results here support the established notion that it does. Rather, much is lost in the understanding of how overeating develops and is maintained among chronic dieters when self-regulation abilities are not considered. It is possible that negative affect may be the catalyst through which overeating initially develops; initial

experiences of food "comforting" a person in times of distress become rewarding, and a pattern develops. Over time, however, overeating may become more of a habitual, "automatic" process, resulting in numerous failed attempts to change/break this cycle and consequently decreasing people's beliefs that they can successfully enact self-control around food. In short, affect regulation may explain how overeating behavior initially develops among chronic dieters, with deficits in perceived self-regulation abilities explaining how this behavior becomes a pattern that is maintained over time.

In line with the previous interpretation, these results support the prediction that perceived self-regulation abilities mediate the relation between negative affect and overeating, such that lower levels of negative affect were related to overeating severity via lower levels of perceived self-regulation abilities (e.g., willpower, craving uncontrollability, distress tolerance). This is consistent with previous theoretical work postulating that self-processes, or self-directed cognitions, are heavily influenced by additional psychosocial mechanisms such as emotion (Bandura, 1993).

Of note, there was a significant direct effect in the mediation models of negative affect on overeating, suggesting greater negative affect on its own is indicative of overeating/severity. However, in multilevel linear regression models negative affect was a less robust predictor of overeating. One possible explanation of this finding is that negative affect *on its own* directly relates to overeating, yet when momentary perceptions of self-regulation abilities are included in the overall picture the effect of negative affect becomes less pronounced. This would suggest that momentary self-regulation abilities may explain greater variability in overeating than negative affect on its own. A second explanation is that the multilevel mediation model is completely within subjects, and all between-person differences have been parsed out. It could be

that within-person, idiographic experiences of momentary negative emotion directly relate to overeating but this effect becomes washed out and less pronounced in light of between-person differences. This would further suggest that researchers and clinicians alike would benefit from considering momentary fluctuations and changes in negative affect in this population, taking into account the individual person and his/her experiences of negative affect rather than making assumptions based on diagnostic category or clinical presentation.

Overall, results here do support previous work in that negative affect does indeed relate to severity of overeating. However, these findings provide a more holistic approach to identifying risk factors of overeating among a chronic dieting population. That is, while negative affect may be one important precursor to overeating it does not exist in isolation and instead explains only some of the variability in the degree and severity of overeating. This study suggests that when analyzing overeating behavior in the context of dieting, there is precedence for considering the role of self-directed cognitions regarding one's perceptions of their own willpower and abilities to tolerate and manage distressing emotions and cravings. By definition, successful dieting requires prominent self-regulation in order to continuously make decisions about food intake (DelParigi et al., 2007); however, the idea that one merely needs "more self-regulation" to make a dieting attempt successful is piddling. One does not overeat simply because they lack self-regulation, just as overeating does not occur solely because one feels a negative emotion. In fact, many individuals cannot clearly articulate *why* they overeat, or what thoughts or feelings occur prior to overeating, instead describing they feel as if they are on "autopilot" and acting out of habit (Brewer et al., 2018). Several participants reported at debrief that simply being forced to stop and consider how they were feeling and what they were thinking gave them insight into their eating patterns they were not previously aware of, which underscores

the power of awareness as a first step to curbing unwanted behavioral engagement. Thus, interventions training individuals to pay attention to and "be with" their negative emotions and perceptions of their willpower, craving controllability, and distress tolerance abilities while dieting may hold promise.

While this current work set out to explore the role of perceived self-regulation abilities in the negative affect – overeating relationship, I did not predict how specific self-directed cognitions would differentially influence overeating. However, findings indicated this population appears to particularly struggle with craving uncontrollability and perceived willpower. First, individuals experienced marked fluctuations and instability in these processes over time. Second, and perhaps most importantly, craving uncontrollability and willpower were the only direct predictors of overeating severity after accounting for distress intolerance, and negative affect.

What does this mean? First and foremost, it is evident that self-regulation abilities are multifaceted. There are unique effects of willpower, self-efficacy, distress intolerance, and craving uncontrollability on behavioral outcomes in this sample of chronic dieters. There are likely additional elements of self-regulation abilities not captured in this study that may further explain why and how negative emotion influences overeating. Future work clarifying and distilling the global construct of self-regulation into multiple facets is clearly warranted. Second, it appears that craving uncontrollability and willpower may represent particular struggles among this sample of chronic dieters in the context of overeating. The clinical implications here are vast. If chronic dieters and individuals who struggle with overeating are particularly susceptible to impairments in perceived craving uncontrollability and willpower beliefs in response to increases in negative affect, therapeutic interventions targeting these domains are likely to be

effective. Specifically, beyond increasing emotion regulation abilities, as extant treatments for dysregulated eating overwhelmingly do, therapeutic interventions could be modified to alter beliefs about willpower and ability to manage cravings. Further, as these two abilities evinced notable instability over time, treatment may benefit with particular attention given to the role of fluctuations in perceived self-regulation abilities. As such, treatments that focus on stabilizing the lability of these two mechanisms may reduce patients' proclivity to overeat. Alternatively, a potential additive to existing treatments may be ecologically momentary interventions that could provide person-specific, contextually based emotion and self-regulation assistance in people's daily lives.

Several limitations to the current work are noteworthy. First, momentary measures of self-efficacy, willpower, and craving uncontrollability were loosely adapted from other studies and their psychometric properties have yet to be formally established. Further work is needed to demonstrate adequate psychometrics of these scales. Further, participants logged an average number of 12 eating episodes during the study. Considering the EMA portion of the study lasted for 7 days, participants reported on less than 2 meals a day, on average. While the sample was comprised of chronic dieters, many whom reported they were currently dieting while completing this study, it is likely that individuals ate more often than they reported. In fact, it is possible that eating events that were not captured may have been classified as "overeating." As previously mentioned, overeating has been viewed as a strategy used to avoid negative emotions (e.g., Cheertham et al., 2010; Haed-Matt & Keel, 2012) and it could be that participants similarly "avoided" answering questions about overeating due to feared distress/discomfort that doing so would elicit.

An additional limitation to this study is the question format during the momentary prompts. Specifically, questions were asked to participants in the same order at both random and eating-initiated prompts. This may be problematic for several reasons, including that participants may have learned to anticipate which questions would follow one another and therefore expended less time and effort on each question, rather than fully considering and introspecting based on question content as intended. Further, (1) the ordering of questions asked, in addition to (2) the timing of assessment in relation to eating episode, significantly limits the robust conclusions that can be drawn from mediation analyses. First, at each prompt, questions about participant's current emotional state were asked first, followed by questions about perceived self-regulation abilities to satisfy assumptions of temporal precedence required for a mediation analysis (Winer, Cervone, Bryant, McKinney, Liu, & Nardorff, 2016). This, by default, assumes that emotionality precedes perceived self-regulation abilities. Of course, it may also be that perceived self-regulation abilities precede emotionality. For instance, believing one has limited ability to tolerate distress may in fact trigger increased distress. However, this relationship cannot be meaningful analyzed in the current study due to the nature of question ordering used in the protocol. Similarly, consistent with previous findings established in literature, it may be the case that overeating causes, rather than is simply caused by, negative emotions such as guilt and shame (Ruddock & Hardman, 2018). Detailed investigation of the ordering of affect and perceived self-regulation processes in future research studies is clearly warranted.

Further, and perhaps more concerning, is that although the purpose of ecological momentary assessment is to capture participant's responses in real-time, there was an inherent retrospective nature by which participants reported on their experiences which also limits conclusions that can be drawn from this study. A major goal of this work was to better capture

and understand how emotional and self-directed cognitive mechanisms interact and predict

overeating in chronic dieters on a momentary level. Ideally, participants would have reported on

their experiences as they were happening, and in fact many participants did so while logging

eating episodes. However, a large majority of participants reported at follow-up that they

completed the eating-initiated prompts immediately after they had eaten, and in particular did so

after having a perceived overeating episode. Conceptually, this makes sense; research and

clinical experience robustly highlights how impulsivity, emotional avoidance, and general lack

of awareness contributes to the cycle wherein chronic dieters continue to overeat rather than

"catch themselves" prior and thwart this behavior. Completing an eating-initiated prompt would

force participants to slow down and use a level of rational, logical thought that may not be

possible when in the middle of overeating. While this conceptually makes since, it negatively

impacts our ability to accurately capture one's internal experience with overeating in the

moment.

Finally, research design considerations, such as measurement reactivity and demand

characteristics, were significant limitations to the current study. This is often a consideration in

research involving participants, and in fact was a driving factor to consider studying overeating

in daily life where participants were not in a laboratory and being monitored by a research

assistant. That said, although ecological momentary assessment removes the participant from a

laboratory, they are still aware that their responses are being recorded and this may cause them

to not accurately report on their experiences and/or to report based on how they believed they

"should." For instance, participant ratings of their momentary emotion and self-regulation

following food consumption were likely influenced based on the quality of the eating event

itself. That is, an individual who reports overeating is likely to also report they experienced

cravings and/or other underlying processes to help them make sense of or "justify" their behavior (Maurer et al., 2006). To control for this, lagged analyses could be run such that emotion and self-regulation ratings could be used to predict *next* episode of overeating severity. Alternatively, participants could be instructed to report on perceived craving experiences, rather than eating episodes themselves, which would allow investigators to evaluate whether participants acted on these cravings and other self-directed cognitions. Importantly, research has not robustly found that EMA induces reactivity (Rowan et al., 2007), and investigating people in their daily lives is arguably a much closer representation of how they interact with and experience the world than in a laboratory setting, making the limitations a worthwhile tradeoff for the current work.

Conclusion

Evaluating the beliefs individuals hold about themselves and their abilities, and how these beliefs shift based on time and context, may clarify how and why chronic dieters overeat in response to distressing, negative emotions. People clearly varied in how capable they felt about their ability to exert willpower, self-efficacy, tolerate distress, and control their cravings in their daily life. These perceptions were also linked to momentary negative affect, highlighting the robust link between emotion and perceptions of self-control (Tice & Bratslavsky, 2000). As chronic dieters encounter daily life situations influencing their emotional states and challenging their self-control, understanding their emotional experiences as well as their perceptions of their self-regulation abilities may be powerful in developing new interventions for helping people succeed at dieting and decrease overeating.

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APPENDIX A

QUESTIONS FOR RANDOM PROMPTS AND EXTENDED EATING PROMPTS			
Category	Variable	Question	Response choices Names
Emotion		Right now, I feel_____?	0 = not at all
	E_Joyful	Joyful	1 = minimally
	E_Excite	Excited	2 = slightly
	E_Happy	Happy	3 = somewhat
	E_AtEase	At Ease	4 = moderately
	E_Calm	Calm	5 = very much
	E_Content	Contented	6 = extremely
	E_Sad	Sad	
	E_Lonely	Lonely	
	E_Guilty	Guilty	
	E_Irrit	Irritable	
	E_Nervous	Nervous	
	E_Dis	Dissatisfied with myself	
	E_Numb	Numb	
Craving	CR_1	Right now, my craving to eat is _____.	0 (zero) to 100 (extreme)
Craving	CR_1	Right now, my urge to eat is _____.	0 (zero) to 100 (extreme)
Craving	CR_3	Right now, at this moment, my desire to resist eating is:	0 (zero) to 100 (extreme)
Craving Controllability	CR_4	I don't have any control over my current craving. [craving controllability]	1 = strongly disagree 2 = moderately disagree 3 = mildly disagree 4 = agree and disagree equally 5 = mildly agree 6 = moderately agree 7= strongly agree
Willpower	WP_1	Right now, I have _____ willpower.	0 = none at all 1 = minimal 2 = slight 3 = some 4 = moderate 5 = high 6 = extremely high
Willpower	WP_2	If I had to do a task right now that required significant self-control, I	0 = not at all 1 = minimally 2 = slightly

		would be successful at that task.	3 = somewhat 4 = moderately 5 = very much 6 = extremely
Willpower	W_3	If something tempting came across my path right now, I would have the strength to resist it.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Tired	T_1	I am _____ tired right now.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very 6 = extremely
Hunger	H_1	I am _____ hungry right now.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very 6 = extremely
Self-Efficacy	SE_1	Right now, I am confident I could overcome any challenges that might make me want to eat more food than I would like. [self-efficacy; item from Gwaltney et al., 2005]	1 = strongly disagree 2 = moderately disagree 3 = mildly disagree 4 = agree and disagree equally 5 = mildly agree 6 = moderately agree 7 = strongly agree
Distress InTolerance	DT_1	I want to stop what I'm doing right now so I can feel better	1 = strongly disagree 2 = moderately disagree 3 = mildly disagree 4 = agree and disagree equally 5 = mildly agree 6 = moderately agree 7 = strongly agree
Distress InTolerance	DT_5	Right now, my emotions are getting in my way.	[same as DT_1]
Distress InTolerance	DT_10	I can keep doing what I'm doing right now,	[same as DT_1]

		regardless of how I feel [R]	
Situation/Context	Location	Where are you right now?	0 = Home 1 = Work 2 = Other's Home 3 = Bar or restaurant 4 = School 5 = In Transit 6 = Other
Situation/Context	Activity	What were you doing when you received this notification?	0 = In class 1 = Working 2 = Traveling 3 = Internet/Texting 4 = Housework 5 = Leisure (movies, tv, friends) 6 = Exercising 7 = Interacting with Others 8 = Nothing 9 = Other
Situation/Context	Social	Who are you with right now?	0 = I am alone 1 = Spouse or romantic partner 2 = Friend 3 = Family members 4 = Acquaintance/classmates 5 = Coworker 6= Other
Situation/Context	OthersEat	Are other people nearby eating right now?	0 = No 1 = Yes
Situation/Context	Alcohol	Have you had any alcohol since the last prompt?	0 = No 1 = Yes
Situation/Context	Alc_Drks	[If yes to Alcohol] How many drinks have you had since the last prompt?	[numeric response]
Situation/Context	Food	Are you currently eating?	0 = No 1 = Yes
Situation/Context	Caffeine	Are you currently drinking caffeine (soda, energy drink, coffee)	0 = No 1 = Yes

Situation/Context Stress		Have you experienced a significant stressor in the last 15 minutes?	0 = No 1 = Yes

QUESTIONS FOR EATING-INITIATED PROMPTS			
Category	Variable Question Response choices Names		

Eating	Eat_Now	I am eating right now.	0 = No
Eating		Why are you eating food right now? (note: items from the Palatable Eating Motives Scale (PEMS; Burgess, Turan,	1 = Yes 0 = Not current motive 1 = Current motive
	Mot_Crav	Lokken, Morse, &	
	Mot_Cope	Boggiano, 2014) and	
	Mot_Pos	from Piasceki,	
	Mot_Habit	Richardson, & Smith,	
	Mot_Soc	2007)	
	Mot_Rew		
	Mot_Bored	Reduce craving	
		Cope with negative	
	Eat_Over	emotion	
Eating		Enhance positive emotion	1 = not at all
			2 = slightly
		Habit	3 = somewhat
		To be sociable	4 = moderately
	Eat_LOC	Because you like the	5 = extremely
Eating		feeling	0 = not at all
		Boredom/to Kill time	1 = minimally
		To what extent do you	2 = extremely
		feel that you overate?	0 = not at all
			1 = minimally
			2 = slightly
		While you were	3 = somewhat
		eating, to what extent	4 = moderately
		did you feel a sense of	5 = very
		loss of control?	6 = extremely
			0 = not at all
	Eat_Calorie		1 = minimally
Eating			2 = slightly
			3 = somewhat
			4 = moderately
			5 = very
			6 = extremely

		How many calories do you believe you just consumed?	[Numeric Response Only]
Eating	E_Stressor	Did a stressful event occur or begin in the past 15 minutes?	0 = No 1 = Yes
Eating	Enjoyment	I enjoyed the food I just ate	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Eating (Pre)		Immediately *before* eating, I felt_____?	0 = not at all 1 = minimally
	PreE_Joyful	Joyful	2 = slightly
	PreE_Excite	Excited	3 = somewhat
	PreE_Happy	Happy	4 = moderately
	PreE_AtEase	At Ease	5 = very much
	PreE_Calm	Calm	6 = extremely
	PreE_Content	Contented	
	PreE_Sad	Sad	
	PreE_Lonely	Lonely	
	PreE_Guilty	Guilty	
	PreE_Irrit	Irritable	
	PreE_Nervous	Nervous	
	PreE_Dis	Dissatisfied with myself	
Eating (Pre Craving)	PreE_CR_1	Immediately *before* eating, my craving to eat was _____.	0 (zero) to 100 (extreme)
Eating (Pre Craving)	PreE_CR_2	Immediately *before* eating, my urge to eat was _____.	0 (zero) to 100 (extreme)
Eating (Pre Craving)	PreE_CR_3	Immediately *before* eating, at this moment, my desire to resist eating was:	0 (zero) to 100 (extreme)
Eating (Pre Craving)	PreE_CR_4	Immediately *before* eating, I didn't have any control over my current craving. [craving controllability]	1 = strongly disagree 2 = moderately disagree 3 = mildly disagree 4 = agree and disagree equally 5 = mildly agree 6 = moderately agree

Eating (Pre Willpower)	PreE_WP_1	Immediately *before* eating, I had_____ willpower.	7= strongly agree 0 = none at all 1 = minimal 2 = slight 3 = some 4 = moderate 5 = high 6 = extremely high
Eating (Pre Willpower)	PreE_WP_2	Immediately *before* eating, if I had to do a task that required significant self-control, I would have been successful at that task.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Eating (Pre Willpower)	PreE_WP_3	Immediately *before* eating, if something tempting came across my path, I would have had the strength to resist it.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Tired	E_T_1	I am _____ tired right now.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Hunger	E_H_1	I am _____hungry right now.	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Eating (Pre DT)	PreE_DT_1	Immediately *before* eating, I wanted to stop what I was doing so I could feel better	1 = strongly disagree 2 = moderately disagree 3 = mildly disagree 4 = agree and disagree equally 5 = mildly agree 6 = moderately agree 7= strongly agree

Eating (Pre DT)	PreE_DT_5	Immediately *before* eating, my emotions were getting in my way.	[same as DT_1]
Eating (Pre DT)	PreE_DT_10	I could keep doing what I was immediately *before* eating, regardless of how I felt. [R]	[same as DT_1]
Situation/Context	E_Location	Where are you right now?	0 = Home 1 = Work 2 = Other's Home 3 = Bar or restaurant 4 = School 5 = In Transit 6 = Other
Situation/Context	E_Activity	What were you doing when you received this notification?	0 = In class 1 = Working 2 = Traveling 3 = Internet/Texting 4 = Housework 5 = Leisure (movies, tv, friends) 6 = Exercising 7 = Interacting with Others 8 = Nothing 9 = Other
Situation/Context	E_Social	Who are you with right now?	0 = I am alone 1 = Spouse or romantic partner 2 = Friend 3 = Family members 4 = Acquaintance/classmates 5 = Coworker 6= Other
Situation/Context	E_OthersEat	Are other people nearby eating right now?	0 = No 1 = Yes
Situation/Context	E_Alcohol	Have you had any alcohol since the last prompt?	0 = No 1 = Yes
Situation/Context	E_Alc_Drks	[If yes to Alcohol] How many drinks have	[numeric response]

		you had since the last prompt?	
Situation/Context	E_Food	Are you currently eating?	0= No 1= Yes
Situation/Context	E_Caffiene	Are you currently drinking caffeine (soda, energy drink, coffee)	0= No 1= Yes
Situation/Context	E_Stress	Have you experienced a significant stressor in the last 15 minutes?	0= No 1= Yes

QUESTIONS FOR EVENING PROMPT			
Category	Variable Names	Question	Response choices
App Problems	Problems	Did you have any difficulty responding to the prompts today?	0 = no 1 = yes
App Problems	Prob_Expla	Please explain the problems you experienced responding to the prompts	[free text response]
Eating_Log	Missed	How many times did you eat today that you did not log?	[free response]
Eating _Log	Missed_Why	Why did you not log these eating events?	[free response]
Stress	Stressor	Think about the most stressful event that occurred to you today. What was it?	[free text response]
Stress	S_Intense	How intense was the stressful situation for you??	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely

Stress	S_Duration	How long were you emotionally affected by this stressful situation?	0 = less than 5 minutes 1 = 5 to 10 minutes 2 = 11 to 20 minutes 3 = 21 to 30 minutes 4 = 31 minutes to 1 hour 5 = Longer than 1 hour but over now 6 = ongoing
Stress		At the PEAK of your stressful situation, how did you feel?	0 = not at all 1 = minimally 2 = slightly
	ST_Joyful	Joyful	3 = somewhat
	ST _Excite	Excited	4 = moderately
	ST _Happy	Happy	5 = very much
	ST _AtEase	At Ease	6 = extremely
	ST _Calm	Calm	
	ST _Content	Contented	
	ST _Sad	Sad	
	ST _Lonely	Lonely	
	ST _Guilty	Guilty	
	ST _Irrit	Irritable	
	ST _Nervous	Nervous	
	ST _Dis	Dissatisfied with myself	
		To manage your feelings about the stressful event, to what extent have you:	
Stress	ER_Escape	Tried to escape the situation	0 = not at all 1 = minimally 2 = slightly 3 = somewhat 4 = moderately 5 = very much 6 = extremely
Stress	ER_Reapp	Tried to think about the situation differently	[same as above]

Stress	ER_ExSup	Tried to avoid showing how I was feeling to other people	[same as above]
Stress	ER_ThSup	Tried to avoid thinking about the situation	[same as above]
Stress	ER_Distant	Tried to view the situation as if it were happening to someone else	[same as above]
Stress	ER_Support	Sought support from someone	[same as above]
Stress	ER_Why	Tried to mentally figure out why the situation happened	[same as above]
Stress	ER_Accept	Tried to "sit with" or accept my feelings	[same as above]
Stress	ER_Dist	Tried to distract myself	[same as above]
Stress	ER_Fix	Tried to fix the situation/problem solve	[same as above]
Stress	ER_Brood	Brooded or ruminated about what happened.	[same as above]
Stress			
		Did you _____ to help manage your feelings about the stressful event?	0 = No 1 = Yes
	BR_Food	Eat food	
	BR_Exr	Exercise	
	BR_Alc	Drink alcohol	
	BR_Drug	Use drugs	
	BR_Sex	Have sex/masturbate	
	BR_Smoke	Smoke	
	BR_Punch	Punch	
	BR_Write	Write or journal	
	BR_Hurt	Hurt yourself (self-injure)	
	BR_Vent	Vent to someone	
Eating	Eat_Predict	Do you think you will overeat tomorrow?	0 = No 1 = Yes
	OE_Total	How many times do you think that you overate today?	

UNIVERSITY OF ARKANSAS

To:	Kayla Dawn Skinner BELL 4188
From:	Douglas James Adams, Chair IRB Committee
Date:	11/28/2017
Action:	**Expedited Approval**
Action Date:	11/28/2017
Protocol #:	1711082816
Study Title:	Dynamics of Momentary Perceived Self-Regulation Abilities as Novel Predictors of Overeating in Daily Life
Expiration Date:	11/23/2018
Last Approval Date:	

The above-referenced protocol has been approved following expedited review by the IRB Committee that oversees research with human subjects.

If the research involves collaboration with another institution then the research cannot commence until the Committee receives written notification of approval from the collaborating institution's IRB.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.

Protocols are approved for a maximum period of one year. You may not continue any research activity beyond the expiration date without Committee approval. Please submit continuation requests early enough to allow sufficient time for review. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study closure.

Adverse Events: Any serious or unexpected adverse event must be reported to the IRB Committee within 48 hours. All other adverse events should be reported within 10 working days.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, study personnel, or number of participants, please submit an amendment to the IRB. All changes must be approved by the IRB Committee before they can be initiated.

You must maintain a research file for at least 3 years after completion of the study. This file should include all correspondence with the IRB Committee, original signed consent forms, and study data.

cc: Danielle E Baker, Investigator
     Kaitlyn D Chamberlain, Investigator
     Morgan A Hill, Investigator
     Jenn Veilleux, Investigator