



# A daily diary study of perceived social isolation, dietary restraint, and negative affect in binge eating



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## ABSTRACT

Negative affect and dietary restraint are key predictors of binge eating, yet less is known about the impact of social factors on binge eating. The study sought to replicate and extend research on the relationships between negative affect, dietary restraint, perceived social isolation and binge eating using a daily diary methodology. College women ( $N = 54$ ) completed measures of dietary restraint, negative affect, perceived social isolation, and binge eating daily for 14 days. Participants completed the measures nightly each day. A series of generalized estimating equations showed that dietary restraint was associated with less binge eating while controlling for negative affect and for perceived social isolation separately. Negative affect and perceived social isolation were associated with greater binge eating while controlling for restraint in separate analyses, but only perceived social isolation was significant when modeled simultaneously. All two-way interactions between negative affect, dietary restraint, and perceived social isolation predicting binge eating were nonsignificant. This study furthers our understanding of predictors of binge eating in a nonclinical sample. Specifically, these data suggest perceived social isolation, negative affect, and dietary restraint are important variables associated with binge eating in daily life and warrant further research.

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Binge eating involves eating abnormally large quantities of food in a short period of time, is associated with a perceived loss of control, and may be symptomatic of an eating disorder (American Psychiatric Association [APA], 2013). Binge eating and related disorders are associated with increased psychiatric morbidity (Hudson, Hiripi, Pope, & Kessler, 2007) and obesity (Stunkard & Allison, 2003). Two prominent models explaining binge eating include the affect regulation model (Polivy & Herman, 1993) and restraint model (Polivy & Herman, 1985). Respectively, these models posit that negative affect and dietary restraint are important factors that predict binge eating. Intensive longitudinal studies (e.g., daily diary, ecological momentary assessment studies), which are increasingly being used to study disordered eating, have supported both negative affect (Haedt-Matt & Keel, 2011) and restraint (Sherry & Hall, 2009) as predictors of binge eating. Although studied to a lesser extent, social isolation has also been found to be

associated with disordered eating in cross-sectional research (Ray, 2012; Waller, Dickson, & Ohanian, 2002). The relationship between social isolation and binge eating is particularly important to study as data show that social isolation has increased in the U.S. in recent years (McPherson, Smith-Lovin, & Brashears, 2006). The purpose of the current study was to examine the utility of negative affect, dietary restraint, and perceived social isolation in explaining binge eating and to evaluate the interactive effects of these variables using a daily diary methodology. Daily diary methodologies have several strengths compared to cross-sectional studies that can further our knowledge of binge eating including repeated assessment in participants' natural environment (increased ecological validity), limiting retrospective reporting bias, and examination of within (daily) and between (person) relationships between variables.

## 1. Negative affect, restraint, and binge eating

The affect regulation model of binge eating suggests that individuals engage in binge eating to cope with negative affect. A recent meta-analysis of ecological momentary assessment studies

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that examined negative affect and binge eating reported that negative affect increases prior to binge eating (Haedt-Matt & Keel, 2011). The affect regulation model of binge eating posits that negative affect declines following binge eating (Polivy & Herman, 1993), thus maintaining the behavior through negative reinforcement (removal of an aversive stimulus after engaging in a behavior; Haedt-Matt & Keel, 2011). Studies supporting this theory have in fact shown that during (e.g., Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003) and after (e.g., Smyth et al., 2007) engaging in binge eating, individuals' negative affect tends to decrease. Given the large body of research findings confirming associations between negative affect and binge eating, the affect regulation model of binge eating is one of the most prominent models of binge eating currently.

The restraint model is another well-studied model used to explain binge eating, and suggests that binge eating is related to calorie restriction (i.e., dietary restraint) via a variety of possible affective, cognitive, and physiological pathways (Hagan, Chandler, Wauford, Rybak, & Oswald, 2003; Polivy & Herman, 1985). For example, increased appetite and hunger or responsiveness to external food cues may cause restrained individuals to engage in binge eating, (Klajner, Herman, Polivy, & Chhabra, 1981; Polivy & Herman, 1985). Also, individuals who violate dietary food rules or believe themselves incapable of successfully continuing dieting (such as in the presence of highly palatable food) may choose to end dietary restriction temporarily (Polivy & Herman, 1985). Several studies evaluating between-person effects have found positive associations between dietary restraint and binge eating (Sherry & Hall, 2009; Stice, 2001; Woods, Racine, & Klump, 2010), suggesting that people who tend to restrain more are also more likely to engage in binge eating. There is more limited evidence for the relationship between dietary restraint and binge eating at the (within-person) day level. To date only one study has used a daily diary approach to examine the daily relationship between caloric restriction and binge eating (Zunker et al., 2011). Researchers found that in a sample of women with bulimia, participants who reported caloric restriction had increased odds of binge eating on the same day and the following day (Zunker et al., 2011). Together these studies show that people who engage in restraint behaviors are likely to also report binge eating (between-person effects), but less is known about how this process operates at the within-person daily level, particularly for non-clinical samples.

In addition to evaluating the affect regulation and restraint models of binge eating separately, several studies have also looked at the potential influence of negative affect and restraint within a single model. For instance, Sherry and Hall (2009) conducted a study assessing both dietary restraint and depressed affect and their influence on binge eating. Although they used a daily diary approach, the daily assessments were aggregated across days, and thus, only provide information about the between-person relationships between these variables. The results showed that after including dietary restraint and depressed affect together as predictors of binge eating, only dietary restraint emerged as a significant predictor of binge eating (Sherry & Hall, 2009). In separate cross-sectional studies, negative affect and dietary restraint were together significantly associated with binge eating (Stice, Akutagawa, Gaggan, & Agras, 2000; Womble et al., 2001) and bulimic symptoms (Stice, 2001). The aforementioned reviewed studies, however, examined dietary restraint, negative affect, and binge eating at the between-subjects level, so the within-person relationship between negative affect and dietary restraint and their effect on binge eating is still unclear.

### 1.1. Interaction of negative affect and restraint

The distraction model of binge eating suggests that when restrained individuals experience negative affect, the negative affect interferes with their dietary vigilance resulting in binge eating (Stice et al., 2000). Experimental research has produced results consistent with the distraction model (Cools, Schotte, & McNally, 1992; Schotte, Cools, & McNally, 1990). For example, one study found that restrained eaters who watched a negative mood-inducing film ate more than restrained eaters who watched a neutral film and unrestrained eaters in both conditions (Schotte et al., 1990). In a cross-sectional test of the distraction model among men and women, an interaction was found between negative affect and dietary restraint suggesting that the relationship between restraint and binge eating was greatest for people with higher levels of NA (Stice et al., 2000). Although, there is some limited evidence for the distraction model of binge eating, these studies have used either experimental or cross-sectional approaches, and to date no study has tested this model within-people and in natural settings.

## 2. Social isolation and binge eating

Etiological models aimed at understanding eating disturbances have often studied the effect of negative affect and dietary restraint and binge eating, but various aspects of the social self and social environment have been implicated in the development and maintenance of eating disorders as well. Social anxiety or phobia (Hudson et al., 2007), social comparison (Thompson & Coovert, 1999), poor social functioning (Wilfley, Wilson, & Agras, 2003), and social support (Tiller et al., 1997) have all been associated with eating disturbances. One aspect of the social environment that may play an important role in the onset or maintenance of eating disturbances such as binge eating is social isolation. Social isolation can be objective or perceived (Friedler, Crapser, & McCullough, 2014). Objective social isolation has been defined as a numerical lack of social contacts while perceived social isolation, or loneliness, refers to a person's appraisal of the quality of social relationships.

Although there is relatively little research examining the relationship between social isolation and disordered eating behaviors, Levine (2012) argued that there is an enduring association between loneliness and eating disorder symptoms. It is possible that loneliness impacts binge eating via a reduced capacity for self-regulation (Hawkey & Cacioppo, 2010), or loneliness may function similar to negative affect, with people using binge eating as a way to cope with feelings of loneliness. In clinical and community samples, researchers have found that people who report greater perceived social isolation often have higher levels of disordered eating behaviors (Mason & Lewis, 2015; Ray, 2012; Waller et al., 2002). Further, a study comparing normal weight individuals with and without bulimia found that the individuals with bulimia spent more time alone (i.e., a possible component of perceived social isolation) than those without bulimia (Johnson & Larson, 1982). However, all research to date has been cross-sectional in nature, thus limiting our understanding of how perceived social isolation may influence binge eating behaviors at the daily level.

### 2.1. Perceived social isolation as a moderator

Given that perceived social isolation may be associated with a reduced capacity for self-regulation, it could be an important moderating mechanism of the associations between negative affect, restraint, and binge eating. For example, in an experimental study, women were assigned to either a loneliness condition in which they were asked to think about times when they lacked

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