Examination of the interpersonal model of loss of control eating in the laboratory

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Abstract

Background: The interpersonal model of loss of control (LOC) eating proposes that interpersonal problems lead to negative affect, which in turn contributes to the onset and/or persistence of LOC eating. Despite preliminary support, there are no data examining the construct validity of the interpersonal model of LOC eating using temporally sensitive reports of social stress, distinct negative affective states, and laboratory energy intake.

Method: 117 healthy adolescent girls (BMI: 75th–97th %ile) were recruited for a prevention trial targeting excess weight gain in adolescent girls who reported LOC eating. Prior to the intervention, participants completed questionnaires of recent social stress and consumed lunch from a multi-item laboratory test meal. Immediately before the test meal, participants completed a questionnaire of five negative affective states (anger, confusion, depression, fatigue, anxiety). Bootstrapping mediation models were conducted to evaluate pre-meal negative affect states as explanatory mediators of the association between recent social stress and palatable (desserts and snack-type) food intake. All analyses adjusted for age, race, pubertal stage, height, fat mass percentage, and lean mass.

Results: Pre-meal state anxiety was a significant mediator for recent social stress and palatable food intake ($p < .05$). By contrast, pre-meal state anger, confusion, depression, and fatigue did not mediate the relationship between social stress and palatable food intake ($p s N .05$).

Discussion: Pre-meal anxiety appears to be the salient mood state for the interpersonal model among adolescent girls with LOC eating. Interventions that focus on improving both social functioning and anxiety may prove most effective at preventing and/or ameliorating disordered eating and obesity in these adolescents.

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1. Introduction

Loss of control (LOC) eating, or the subjective experience of being unable to stop eating, regardless of the amount of food consumed, is commonly reported by youth [1]. The endorsement of recent LOC eating is associated with greater depressive and anxiety symptoms [2–4], lower self-esteem [5,6], higher likelihood of overweight and obesity [7], more physiological markers of stress [8,9], and a greater odds of presenting with components of the metabolic syndrome [10]. Of particular concern are data demonstrating that LOC eating places youth at undue risk for excess weight and fat gain [11,12] and exacerbation of metabolic syndrome components [13]. This may be partially due to the consistent finding that youth with LOC eating tend to consume meals

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composed of highly palatable dessert and snack-type foods compared to their peers without LOC eating [14–16]. Moreover, reports of LOC eating in adolescence and emerging adulthood appear to increase risk for future psychosocial impairment, depression [7,17], the development of partial- and full-syndrome binge eating disorder, and the worsening of mood symptoms [18].

One theoretical framework for understanding LOC eating is interpersonal theory [19]. Originally stemming from the adult depression literature [20], the interpersonal model of LOC eating highlights the importance of negative affect for both the development and maintenance of aberrant eating [19]. Specifically, the interpersonal model proposes that difficulties characterized by high or poorly resolved conflict and/or inadequate support in relationships lead to negative emotions. In turn, negative emotions contribute to the onset and/or persistence of LOC eating as a mechanism to cope with interpersonal distress [21–23]. Thus, interpersonal theory is an extension of affect theory, which proposes that out of control eating provides relief from negative affective states either through escape or by means of a “trade off” between an aversive emotion that precipitates the LOC eating episode (e.g., anger, frustration, anxiety) and a less aversive emotion following the episode [e.g., guilt; [24]]. While eating provides initial relief from the negative affective state and thus is reinforcing, relief is often temporary [25]. As a result, in some individuals, eating develops into a maladaptive strategy for managing negative affect, as repeated LOC eating episodes become needed to sustain relief [26].

A number of studies have supported components of the affect theory of LOC eating [26–30]. For example, in a cohort of adolescent girls who reported LOC eating, we found that a composite score of several negative affective states (anger, confusion, depression, fatigue, and anxiety) was positively linked to highly palatable snack food intake as measured by meal intake at a laboratory test meal. Examining palatable food intake as a proxy for LOC eating [14,15] provided a more objective measure of out of control eating than self-report [26]. Yet, we did not evaluate the individual components of negative affect or the role of interpersonal factors in this report. Elucidating specific facets of negative affect and interpersonal factors would allow for more targeted, and thus potentially more effective, interventions in these youth. Extending these data to test the full interpersonal model may be particularly important for understanding LOC eating in adolescence. During this developmental stage, relationships are closely tied to self-evaluation and are often a primary source of social stress [31]. In part because of the association with having excess weight, youths with LOC eating are particularly vulnerable to forms of social stress such as weight-related teasing and social isolation [17]. Not surprisingly, these factors have been suggested to influence the onset and course of LOC eating [32–36]. Indeed, results from longitudinal studies indicate that family weight-based teasing [37,38] and impaired interpersonal functioning [39] predicts increases in and the onset of future disordered eating behaviors. Similarly, among females, greater psychosocial problems in late adolescence increase the odds of having binge eating in early adulthood, thus highlighting interpersonal problems as a putative risk factor for binge eating later on in life [36].

While the interpersonal model has been widely used to explain binge eating in adults [e.g., [28,29,40–43]], and interpersonal psychotherapy has been adapted as an efficacious treatment for adult binge eating disorder [19,44], only two studies have simultaneously evaluated all components of the interpersonal model of LOC eating in youth [27,30]. The first study used structural equation modeling in a large sample of children and adolescents and found that parent-reported social problems were positively associated with children’s reported presence of LOC eating. This relationship was mediated by children’s reports of trait-like negative affect [30]. However, this study had several limitations. There was no objective measurement of food intake, and by having all measures collected at one time point, the temporal sequence of constructs remains unclear [45]. The second study used ecological momentary assessment in adolescent girls with overweight and found that although interpersonal problems predicted LOC eating episodes, and between-subjects interpersonal problems predicted increased negative affect, negative affect did not predict LOC eating episodes [27]. However, this study was not adequately powered for mediation and also did not examine specific components of interpersonal problems or negative affect [27].

Therefore, to extend on our prior work [26,30], the objective of this study was to examine the validity of the interpersonal model of LOC eating using temporally sensitive reports of interpersonal stress, distinct negative mood states, and snack food intake as a proxy for LOC eating [14,15]. We hypothesized that among adolescent girls with reported LOC eating, recent social stress would be associated with highly palatable dessert and snack food intake in the laboratory [26]. Moreover, we explored several negative affective states to determine the specific moods that mediate the relationship between social stress and intake.

2. Material and methods

2.1. Participants and recruitment

Participants were adolescent girls (12–17 y) recruited for a prevention trial aimed at reducing excess weight gain in adolescent girls at high-risk for adult obesity (ClinicalTrials.gov ID: NCT00263536). Some of these data have been previously published [26,46,47], and this paper is an extension of previously published research [26].

To be eligible for the study, girls were deemed at risk for excess weight gain due to a body mass index (BMI, kg/m²) between the 75th and 97th percentiles and the report of at least one episode of LOC eating in the month prior to
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