Distinctions between two expectancies in the prediction of maladaptive eating behavior

Jessica L. Combs [a,*], Gregory T. Smith [a], Jean R. Simmons [b]

[a] Department of Psychology, University of Kentucky, Lexington, KY 40506-0044, United States
[b] Department of Psychology and Psychiatry, The Cleveland Clinic, Willoughby Hills, OH 44094, United States

ARTICLE INFO

ABSTRACT

In this longitudinal study, the authors provide support for the validity of the claim that differences in the nature of the reinforcement that adolescent girls expect from eating contribute to the development of different forms of maladaptive eating. The learned expectancy that eating is pleasurable and rewarding predicted higher levels of social/celebratory over-eating across the first year of middle school but did not predict higher levels of clinical binge eating. In contrast, the expectancy that eating helps one manage negative affect predicted higher levels of binge eating but not of social/celebratory over-eating across the same time period ($n = 394$). The results also supported a reciprocal model in which binge eating predicted higher levels of the expectancy that eating will manage negative affect but not that eating is pleasurable and rewarding; conversely, social/celebratory over-eating predicted higher levels of the expectancy that eating is pleasurable and rewarding but not that eating will manage negative affect.

© 2010 Elsevier Ltd. All rights reserved.

1. Introduction

Women expect food consumption to provide a variety of different forms of reinforcement (Hohlstein, Smith, & Atlas, 1998). We offer a distinction between two domains of expected reinforcement from eating and their different roles with respect to eating disorder risk. One domain involves the expectation that eating alleviates distress, and the other involves the expectation that eating is pleasurable and rewarding. We will demonstrate that the two expectancy domains differentially predict two different forms of maladaptive eating behavior 1 year later among early adolescents, and also that two different forms of maladaptive eating behavior differentially predict each of the two expectancy domains. These findings support the distinction between the two expectancy domains and the domains' different roles in the risk process.

We first review the current state of eating expectancy measurement and the theoretical distinction we make between two different types of expectancy. We then test our proposed distinction longitudinally.

1.1. Expectancies for reinforcement from eating

The basic science literature has identified expectancies as learned anticipations of the likely consequences of behavioral choices (Bolles, 1972; MacCorquodale & Meehl, 1953; Rotter, 1954; Tolman, 1932). Expectancies are understood to represent summaries of individuals' learning histories; they are formed based on the direct and vicarious learning experiences that individuals undergo. The expectancies one forms then influence one's future behavioral choices: one tends to choose behaviors from which one expects rewards and avoid behaviors for which one expects punishment. Application of this perspective has led to useful examinations of many psychological phenomena, including psychopathology (Alloy & Tabachnik, 1984), gambling behavior (Walters & Contri, 1998), risk for alcohol abuse (Smith, Goldman, Greenbaum, & Christiansen, 1995), and risk for smoking (Brandon & Baker, 1991).

Expectancy theory also has been applied to eating disorders: individuals form different eating expectancies, in part, because they are exposed to different learning experiences concerning eating. Eating disorder symptoms can be understood as extreme eating and dieting behavior, which is thought to stem from extreme or unusual learning histories (Fischer, Smith, & Cyders, 2006; Hohlstein et al., 1998; Simmons, Smith, & Hill, 2002; Smith, Simmons, Flory, Annus, & Hill, 2007). Eating expectancies, as summaries of individuals' learning histories regarding reinforcement from eating, are thought to play a causal role in disordered eating behavior (Combs, Pearson, & Smith, in press; Combs, Smith, Flory, Simmons, & Hill, in press; Hohlstein et al., 1998; Pearson, Combs, & Smith, in press; Smith et al., 2007).

The Eating Expectancy Inventory (EEI) has been widely used to measure learned consequences from eating (Hohlstein et al., 1998). An important distinction has been made between two subscales of

---

* Corresponding author. Tel.: +1 214 629 3250; fax: +1 859 323 1979.
E-mail address: combs.jess@gmail.com (J.L. Combs).

the inventory. One subscale, Eating is Pleasurable and Rewarding, reflects the expectancy that eating provides the positive reinforcement of fun and pleasure. Indeed, the body does respond with pleasure to eating through dopaminergic release (Small, Jones-Gotman, & Dagher, 2003). It may be that individual differences on this scale reflect individual differences in what is essentially an adaptive response to food: survival is facilitated because eating is pleasurable. Endorsement of this expectancy has not been thought to increase risk for maladaptive eating behavior, such as clinical binge eating, and it does not differentiate women with bulimia nervosa from psychiatric or normal controls (Hohlstein et al., 1998).

The other scale, Eating Helps One Manage Negative Affect, reflects the expectancy that eating provides the negative reinforcement of relief from subjective distress. This expectancy may assign a role to eating that is less adaptive. A strong endorsement of this expectancy has been hypothesized to increase risk for binge eating behavior (Combs & Smith, 2009; Fischer et al., 2006; Hayaki, 2009; Hohlstein et al., 1998). Consistent with the expectancy hypothesis, the expectancy that eating helps manage negative affect predicted subsequent increases in binge eating behavior in middle school girls (Combs, Smith, et al., in press; Smith et al., 2007) and distinguished women with a diagnosis of bulimia nervosa from other women (Hohlstein et al., 1998).

Although this theoretical distinction exists between the two eating expectancies, and although measures of the two expectancies have different cross-sectional associations with bulimia nervosa diagnosis consistent with theory, to date there have been no prospective studies investigating whether these two different forms of learning lead to different eating behaviors. To provide such a test, we used the first two waves of the longitudinal sample described by Smith et al. (2007); we thus measured 394 girls at the start of middle school and again 1 year later. We tested differential prospective prediction hypotheses, by contrasting two different eating outcomes: binge eating and social or celebratory over-eating, which we describe as a behavior that reflected the fun, pleasurable aspect of eating. Although such over-eating can certainly be maladaptive, it likely reflects a form of excessive positive reinforcement that is unlikely (by itself) to be associated with clinical eating disorders.

We anticipated that the expectancy that eating helps one manage negative affect would be associated with higher levels of binge eating behavior but not higher levels of social/celebratory over-eating, and that the expectancy that eating is pleasurable and rewarding would be associated with social/celebratory over-eating but not binge eating.[1] Because expectancies are understood to be a summary of individuals' learning histories, we also anticipated reciprocal effects from behavior to expectancy. Binge eating may well reduce the immediate experience of negative affect, through distraction and other means (Fischer et al., 2006); accordingly, we anticipated that binge eating behavior would lead to stronger endorsement of the expectancy that eating helps one manage negative affect. Similarly, social/celebratory over-eating is likely experienced as pleasurable, so we anticipated that this behavior would lead to stronger endorsement of the expectancy that eating is pleasurable and rewarding. We thus examined prospective prediction both from expectancies to subsequent behavior and from behavior to subsequent expectancies. Specifically, we hypothesized that each expectancy, measured at Time 1, would predict higher levels of its associated behavior at Time 2. We also tested whether each behavior at time 1 predicted higher levels of its associated expec-

tancy at Time 2. These tests provide the first evaluation of the hypothesis that different forms of eating-related learning predict different forms of eating behavior, and that eating behavior shapes eating-related learning. Of course, prospective prediction is not demonstration of causality, for which experimental manipulation is required.

2. Method

2.1. Participants

The participants in this study were 394 middle school girls assessed in the fall of their first year of middle school (7th grade; Time 1), and again in the fall of their 8th grade year (Time 2). At Time 2, 343 participants remained in the study (87%). As described in Smith et al. (2007), missing data appear to have been missing at random, so we used the expectation maximization procedure to impute missing values (Enders, 2006); doing so enabled us to report results from the full $N = 394$ sample. The mean age of the participants at the initiation of the study was 12.8 years. Most were Caucasian (78.7%), followed by African American (10.5%); the remainder of the sample identified themselves as Asian (3.3%), Hispanic (2.9%), American Indian (1.7%), or Arab (1.7%). The socioeconomic makeup of the sample was diverse, with 26% of the reported family incomes less than $25,000, 50% of the reported family incomes between $25,000 and $50,000, and the remaining 24% of reported family incomes more than $50,000.

2.2. Measures

2.2.1. Demographic and background questionnaire

This measure provided the assessment of the demographic information reported above.

2.2.2. Eating Expectancy Inventory (EEI; Hohlstein et al., 1998)

This 34-item five-factor measure reflects expectancies for reinforcement from eating. For this study, we used two expectancies: eating helps one manage negative affect (EEI 1; sample item: "Eating can help me bury my emotions when I don't want to feel them.") and eating is pleasurable and rewarding (EEI 2; sample item: "Eating is fun and enjoyable."). The development sample found estimates of internal consistency to be $\alpha = .94$ for EEI 1 and $\alpha = .78$ for EEI 2. In the current sample, for EEI I, $\alpha = .95$; for EEI II, $\alpha = .81$. Women with bulimia nervosa score higher than other women on EEI 1, but not on EEI 2 (Hohlstein et al., 1998). In a prior study with this longitudinal sample, EEI 1 predicted membership in trajectory classes characterized by increased binge eating over time (Smith et al., 2007).

2.2.3. Assessment of binge eating: the Binge Eating Scale from the Bulimia Test-Revised (BULIT-R: Thelen, Farmer, Wonderlich, & Smith, 1991)

In two independent studies, the BULIT-R had sensitivity, specificity, and negative predictive values over .90, and positive predictive values over .70 with respect to DSM-IV criteria as diagnosed by interview (Thelen, Mintz, & Vander Wal, 1996; Welch, Thompson, & Hall, 1993). It has a four-factor structure, including binge eating and purging factors, among adolescents (Vincent, McCabe, & Ricciardelli, 1999). Smith et al. (2007) slightly modified the binge eating scale from this measure to create a ten item measure. An example item is "I would presently rate myself a compulsive eater (one who engages in episodes of uncontrolled eating)"; internal consistency for the scale was $\alpha = .88$ in this sample.

---

[1] In a prior study with this longitudinal sample (Smith et al., 2007), we showed that the expectancy that eating helps manage negative affect differentiated among different trajectories of binge eating behavior, across a longer longitudinal time frame.