Published in final edited form as:

Psychol Addict Behav. 2012 March ; 26(1): 112–123. doi:10.1037/a0023460.

The Role of Negative Urgency and Expectancies in Problem Drinking and Disordered Eating: Testing a Model of Comorbidity in Pathological and At-Risk Samples

Sarah Fischer,

Department of Psychology, University of Georgia

Regan Settles,

Department of Psychology, University of Kentucky

Brittany Collins,

Department of Psychology, University of Georgia

Rachel Gunn, and

Department of Psychology, University of Kentucky

Gregory T. Smith

Department of Psychology, University of Kentucky

Abstract

The aim of this study was to test hypotheses derived from a model that explains both the comorbidity of problem drinking and eating disorder symptoms and the difference in risk process between the two disorders. In Study One, the authors examined four personality constructs typically associated with rash action (sensation seeking, lack of planning, lack of persistence, and negative urgency) and disorder-specific expectancies in samples of women with eating disorders, substance dependence disorders, comorbid conditions, and no symptoms ($N = 104$). Negative urgency, the tendency to act rashly when distressed, differentiated the disordered groups from the control group. In contrast, learned expectancies differentiated among clinical groups. Women with eating disorders endorsed high levels of eating and dieting expectancies and women with substance use disorders endorsed high levels of alcohol expectancies, while comorbid women endorsed high levels of both. In Study Two, this pattern of findings was replicated in a sample of fifth grade girls ($N = 905$). Girls who had engaged in binge eating, alcohol use, or both had higher levels of negative urgency than asymptomatic girls, and the pattern of outcome expectancy endorsement was disorder specific. Negative urgency may represent a general, personality influence on both eating disordered behaviors and symptoms of alcohol dependence, which, when combined with learned, behavior-specific expectancies, leads to specific addictive behavior patterns.

Keywords

alcohol; bulimia; impulsivity; urgency

The co-occurrence of eating disorders and substance abuse is well documented. Individuals with symptoms of binge eating and purging often have higher rates of substance abuse and

dependence than individuals without eating disorders (Bulik et al., 2004). Additionally, women with alcohol use disorders often have higher rates of eating disorders than are found in the general population (Sinha, Robinson, Merikangas, Wilson, Rodin, & O'Malley, 1996). While theoretical models explaining the link between the disorders have been articulated, the field lacks empirical tests of these models (Wolfe & Maisto, 2000). One hypothesis regarding comorbidity of EDs and SUDs is that individuals with each disorder tend to have high levels of impulsivity (Kane, Loxton, Steiger, & Dawe, 2004). A second hypothesis is that behaviors such as binge eating and purging and alcohol abuse are associated with various forms of emotion dysregulation (Dansky, Brewerton, & Kilpatrick, 2000; Engel, Boseck, Crosby, Wonderlich, Mitchell, Smyth, et al., 2007).

We propose a model that specifies (a) a common personality contributor to both types of disorders, thus explaining their comorbidity, and (b) an explanation of why, in the presence of a common personality factor, some individuals exhibit alcohol problems, some exhibit symptoms of eating disorders, and some exhibit symptoms of both conditions. In the two studies described in this paper, we report on two initial, cross-sectional tests of hypotheses derived from this model.

The common personality risk factor stems from recent advances in the study of the personality underpinnings of impulsive behavior. Recent research has identified that negative urgency, the tendency to act rashly in response to negative affect, is a contributor to distress-driven rash or impulsive action (Cyders & Smith, 2007, 2008; Whiteside & Lynam, 2001). We thus propose that negative urgency increases vulnerability for both alcohol problems and eating disorders. Among individuals high in negative urgency, we hypothesize that some have learning events that lead them to develop abnormally high expectancies for reinforcement from eating, others develop unusually strong expectancies for reinforcement from drinking, and others develop both types of expectancies. We propose that differential expectancy endorsement explains why some individuals high in negative urgency drink, some binge eat and/or purge, and some engage in both behaviors, and thus exhibit comorbid disorders.

Negative Urgency as a Common Risk Factor Both Alcohol Abuse and Disordered Eating

There is both theoretical and empirical support for the hypothesis that negative urgency is an important risk factor for both alcohol problems and eating disorders. Negative urgency-based rash action is thought to serve the function of distracting an individual from her distress, because she engages in an alternative, reinforcing set of behaviors (Cyders & Smith, 2008; Fischer & Smith, 2008). Indeed, researchers have proposed that both alcohol abuse and binge eating/purging serve emotion regulation functions by distracting individuals from stress or negative affect (Bandura, 1969; Heatherton & Baumeister, 1991).

Several lines of empirical investigation have produced findings consistent with this hypothesis. Numerous cross sectional studies indicate that negative urgency is positively associated with bulimia nervosa (BN) symptoms with moderate to high effect sizes, while other impulsivity related constructs are not (Fischer, Smith, & Cyders, 2008). In addition, negative urgency accounts for significant variance in ED symptoms in clinical samples, even when controlling for other hypothesized risk factors and traits (Anestis, Smith, Fink, & Joiner, 2009; Cyders, Smith, Spillane, Fischer, Annus, & Peterson, 2007; Claes, Vandereycken, & Vertommen, 2005). In children, negative urgency is associated with binge eater status for both girls (Combs, Pearson, & Smith, 2010) and boys (Pearson, Combs, & Smith, 2010).

Similarly, negative urgency is also consistently associated with problem drinking or symptoms of alcohol abuse in clinical, community, college student, and child samples (Verdejo-Garcia, Bechara, Recknor, & Perez-Garcia, 2007; Fischer, Anderson, & Smith, 2004; Gunn & Smith, 2010; Miller, Flory, Lynam, & Leukefeld, 2003; Whiteside & Lynam, 2009). Additionally, young adults with high levels of urgency tend to drink for affect driven reasons (Phillips, Hine, & Marks, 2009).

Importantly, longitudinal research has produced findings consistent with what has been observed cross-sectionally. Negative urgency at the start of college predicts subsequent increases in drinking quantity (Settles, Cyders, & Smith, 2010) and negative urgency predicts increased drinking quantity across the transition from elementary school to middle school (Smith & Zapolski, 2010). Changes in negative urgency co-occur with changes in eating disorder symptoms (Anestis, Selby, & Joiner, 2007). Additionally, negative urgency, in interaction with sexual assault victimization, predicts increased bulimic symptoms over time (Fischer, Stojek, & Collins, 2009), and negative urgency predicts increased binge eating across the transition into middle school (Pearson, Combs, Zapolski, & Smith, 2011). These findings are consistent with numerous studies indicating that distress appears to be an antecedent to binge eating and alcohol use or abuse for many individuals (e.g., Crowther, Snafner, Bonifazi, & Shephard, 2001; Smyth, Wonderlich, Heron, Sliwinski, Crosby, Mitchell, et al., 2007; Swendson et al., 2000; Todd, Armeli, & Tennen, 2009).

Given the findings described above, studying individual variation in the tendency to react impulsively to distress may offer a way to integrate studies of mood and impulsivity in relation to alcohol abuse and disordered eating. Theoretically, individuals who act rashly while experiencing distress are at an increased risk to engage in maladaptive behavior patterns, such as alcohol abuse or binge eating and purging. These individuals may quickly associate negative affect reduction with immediately accessible behaviors, such as binge eating, thus increasing the likelihood of maladaptive eating behavior via negative reinforcement pathways (Fischer et al., 2004). While we hypothesize that negative urgency is a common pathway to both alcohol abuse and disordered eating behavior, other aspects of behavioral control may play a role in these symptoms as well. For example, one recent study noted that lack of forethought may directly influence behavioral symptoms of alcohol abuse, as well as moderate affective pathways to these symptoms (Simons, Carey, & Wills, 2009).

The Influence of Expectancies on Eating and Alcohol Use

An important limitation to a trait-based theory of vulnerability to addiction is that it does not offer specific mechanisms by which a trait leads an individual to a specific behavior. Expectancy theory is one cognitive model depicting the influence of psychosocial learning on an individual's future behavior, which can help bridge the gap between trait and behavior (Tolman, 1932). As a result of either direct or observational learning experiences, individuals form 'if-then' probabilistic relationships, or expectancies, of the future outcomes of similar behaviors.

Numerous longitudinal studies have shown that expectancies for reinforcement from drinking predict both subsequent increases in drinking and the subsequent onset of both drinking and problem drinking (Christiansen, Smith, Roehling, & Goldman, 1989; Goldberg, Halpern-Felsher, & Millstein, 2002; Ouellette, Gerrard, Gibbons, & Reis-Bergan, 1999; Settles et al., 2010; Smith, Goldman, Greenbaum, & Christiansen, 1995; Smith & Zapolski, 2010). Similarly, expectancies for reinforcement from eating and from dieting/thinness predict the subsequent onset of binge eating and purging, as well as subsequent increases in those behaviors (Combs, Smith, Flory, Simmons, & Hill, 2010; Pearson et al., 2011; Smith, Simmons, Flory, Annus, & Hill, 2007; Stice & Whitenton, 2002). Thus, there

is clear evidence that expectancies predict subsequent drinking and disordered eating behavior. Indeed, a significant portion of expectancy formation appears to occur through observational learning and predates symptomatic behavior (Combs et al., in press; Gunn & Smith, 2010; Miller, Smith, & Goldman, 1990; Christiansen et al., 1989). In addition, interventions designed to reduce alcohol expectancies have resulted in lower drinking levels (Darkes & Goldman, 1993, 1998; but see Corbin, McNair, & Carter, 2001). Similarly, interventions designed to reduce expectancies for reinforcement from dieting and thinness have resulted in reduced eating disorder symptoms (Annus, Smith, & Masters, 2008).

In sum, there is a consistent association between negative urgency and both eating disordered behavior and alcohol abuse, and multiple studies of outcome expectancies indicate that they influence subsequent eating and drinking behavior. The proposed model is that individuals with high levels of negative urgency and endorsement of positive outcome expectancies for a given behavior are most vulnerable to the development of compulsive or addictive patterns of these behaviors. In Study 1, we tested whether the cross-sectional associations implied by this model were present in a sample of women who have already developed alcohol dependence, bulimia nervosa or eating disorder not otherwise specified with binge/purge symptoms, and comorbid disorders. In Study 2, we tested whether the same relationships were present in a sample of fifth grade girls. In this latter age group, it is unlikely that individuals have developed bulimia nervosa or substance dependence, so associations between personality traits, expectancies, and problem behaviors do not likely reflect the influence of long-standing psychopathology. Because the tests described in this report were based on cross-sectional data, they are not tests of the temporal sequence of influences implied by the model. Rather, they constitute an initial test of whether the relationships among the variables are consistent with the model. If they are not, the viability of the model would be jeopardized. If they are consistent with the model, then longitudinal tests of the proposed temporal sequence are indicated.

Study One

The goal of Study One was to test whether the following pattern of associations is present among individuals with eating disorders, alcohol use disorders, and comorbid disorders. First, negative urgency should distinguish all three disordered groups from a control group. Second, expectancies for reinforcement from drinking should distinguish individuals with alcohol use disorders from others, *whether or not* they also have eating disorders. Finally, expectancies for reinforcement from eating and from dieting/ thinness should distinguish individuals with eating disorders from others, *whether or not* they also have alcohol use disorders. Individuals with symptoms of both disorders should thus have higher levels of both alcohol and eating expectancies than individuals without those disorders. Because of the much higher rate of eating disorders among women, and to avoid a gender confound, we studied only women for this report. Additionally, we examined rates of current major depressive episodes in the sample to control for other Axis I conditions related to negative mood, eating disorders, and substance abuse.

Method

Participants—The total sample included 104 women drawn from community and treatment center samples. All participants participated in structured clinical interviews (the Eating Disorder Examination—Interview; (EDE) (Fairburn & Cooper, 1993), and the Structured Clinical Interview for DSM–IV; (SCID–I) (First, Gibbon, Williams, Spitzer, & Benjamin, 1997) examining the presence of an eating disorder, a major depressive episode, and substance use and abuse. Participants were classified as having an eating disorder using the EDE, a substance use disorder using the SCID–I, both, or none. Group placement for comorbid individuals was determined after completion of structured clinical interviews for

the entire sample. For example, if an individual in the eating disorder group also met criteria for substance dependence, they were placed in the comorbid group for data analysis and described in the comorbid group section below. These groups and the recruitment methods for each group are described below.

Control: The control group consisted of 14 women who responded to advertisements in the community. None of the participants endorsed symptoms of an eating disorder or met criteria for a substance use disorder. A total of 5 out of the 14 women did not drink alcohol; the remainder endorsed using alcohol between 1 and 10 days per month.

Eating disordered (ED) sample: The ED sample consisted of 40 women who responded to advertisements in treatment centers and the community. All individuals in the sample endorsed purging by vomiting or laxative abuse, and frequency of objective binge eating ranged from 0 to 28 days with a range of 0 to 150 episodes over the past 28 day period (32.5% of the sample did not report engaging in objective binge episodes). Frequency of purging ranged from 2 to 200 episodes over the past 28 days. A total of 32.5% of the sample endorsed frequent purging without the presence of objective binge episodes, and 37.5% of the sample met diagnostic criteria for bulimia nervosa. The remaining 30% of the sample endorsed both binge eating and purging, but both were not at the frequency required to meet diagnostic criteria for BN; thus, they met diagnostic criteria for Eating Disorder Not Otherwise Specified (EDNOS). The mean BMI of the sample was 23.32, with a standard deviation of 4.78. None of the participants met diagnostic criteria for anorexia nervosa. While the EDE assesses behavior over the past 28 days in detail, it also assesses whether or the not symptoms were present over the past three months. Thus, all individuals diagnosed with an eating disorder met the diagnostic criterion that the symptoms be present for at least three months. None of the individuals in this group met criteria for a substance use disorder: approximately 60% of this group reported currently using alcohol.

Substance use disorder (SUD) sample: The SUD sample consisted of 31 participants who were recruited from a local recovery program for substance dependent women. These participants met diagnostic criteria for alcohol dependence in remission, but had also used other drugs frequently, such as cocaine, prescription drugs, methamphetamine, and marijuana. None of the individuals in this group met criteria for an eating disorder. All women had been diagnosed with active substance dependence in the past year.

Comorbid sample: The comorbid sample consisted of 19 women who met criteria for both and alcohol use disorder and an eating disorder. None of the participants met diagnostic criteria for anorexia nervosa (mean BMI of the sample was 22.79). In the SUD sample, one individual met diagnostic criteria for Bulimia Nervosa, three women met diagnostic criteria for Binge Eating Disorder, and one individual endorsed symptoms of binge eating and purging but not twice per week or more for the previous three months (EDNOS). All but two of those individuals reported that the onset of their symptoms occurred after they stopped drinking or using drugs. In the ED sample, 14 women met diagnostic criteria for alcohol abuse or dependence, and all reported that the onset of their substance misuse had occurred after the onset of the eating disorder symptoms. See Table 1 for a summary of demographic information for the entire sample.

Measures

Structured Clinical Interview for DSM-IV-I (SCID-I: First, Gibbon, Spitzer, Williams, & Benjamin, 1997): The SCID-I is a semi-structured interview used to assess the presence of DSM-IV criteria for Axis I disorders. We used sections of the SCID-I that assess the

presence of a substance use disorder and the presence of a Major Depressive Episode in the study.

Eating Disorder Examination (EDE) (Fairburn & Cooper, 1993): The EDE was developed in a structured interview format to provide detailed information on the specific symptoms as well as behavioral and psychological correlates for eating disorder diagnoses. The EDE can be used to derive DSM-IV diagnoses of Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder, and Eating Disorder Not Otherwise Specified. The EDE has four subscales: Restraint, Eating Concern, Weight Concern, and Shape Concern.

UPPS-R (Whiteside & Lynam, 2001): The UPPS-R is a Likert type self-report instrument assessing four impulsivity related constructs: lack of deliberation (acting without forethought), lack of persistence (inability to stay focused on a task), sensation seeking (seeking out new, novel, and thrilling sensations), and negative urgency. Higher scores represent higher levels of impulsivity. The UPPS-R has been validated in multiple samples beyond the original development study, including a multi-trait multimethod study and in several different languages (Kampfe & Mitte, 2009; Smith, Fischer, et al., 2007; Verdejo-Garcia, Lozano, Moya, Alcazar, & Perez-Garcia, 2010). Cronbach's alpha in this sample for the four scales were .87, .90, .86, and .86, respectively. The scales were developed to reflect each impulsivity related construct without item overlap with other constructs. Items were scored so that higher scores reflect higher levels of the construct.

Alcohol Expectancy Questionnaire (AEQ) (Brown, Goldman, Inn, & Anderson, 1980): The AEQ is a 90 item self-report questionnaire that assesses one's beliefs about the positive effects of alcohol consumption. Several studies have found the AEQ to be predictive of drinking behavior, including quantity and frequency of drinking, problems associated with consumption, and treatment outcome (Goldman, Brown, Christiansen, & Smith, 1991). The AEQ contains six subscales assessing specific positive outcomes associated with consumption: alcohol positively transforms a wide variety of events; alcohol facilitates sexual behavior; alcohol facilitates relaxation and tension reduction; alcohol facilitates sociability; alcohol increases pleasurable events, and alcohol facilitates aggression. Cronbach's alpha in this sample for each scale was .90, .86, .80, .88, .76, and .66, respectively. The scale representing the belief that alcohol facilitates aggression was not used in the study because of the low estimate of its internal consistency.

Eating Expectancy Inventory (EEI) (Hohlstein, Smith, & Atlas, 1998): This 34 item self-report inventory comprises five scales which measure expectancies for positive and negative reinforcement from eating. Expectancies for negative reinforcement from eating differentiated bulimic individuals from anorexic individuals and controls in the validation sample. Cronbach's alpha for each scale in this sample were as follows: 1. Eating Alleviates Negative Affect, .95; 2. Eating is Pleasurable and Useful as a Reward, .75; 3. Eating Alleviates Boredom, .78; 4. Eating Enhances Cognitive Competence, .84; and 5. Eating Leads to Feeling out of Control, .90.

Thinness and Restricting Inventory (TREI) (Hohlstein et al., 1998): This 44 item self report inventory consists of items that assess expectancies for overgeneralized life improvement from thinness and dieting (i.e., become more attractive, better respected, more self-reliant, less stressed, and more capable). Endorsement of these expectancies differentiated bulimic and anorexic individuals from a normal control sample and a psychiatric sample in the development and validation study. Cronbach's alpha in this sample was .99.

Procedure—All participants completed the questionnaires and underwent the EDE and SCID-I interviews with trained interviewers. Interviews were taped for the purpose of calculating inter-rater reliability. To obtain inter-rater reliability, 20% of the interviews conducted were reviewed by the first or fifth author. Inter-rater reliabilities of the eating disorder scales of the EDE were calculated as percentage agreement, and were as follows: overall diagnosis: 1.0; frequency of objective binge eating: 1.0; frequency of each type of purging behavior (e.g., self-induced vomiting, diuretic use): 1.0; Restraint: .90; Eating Concern: .98; Weight Concern: .94; Shape Concern: .92. Inter-rater reliability for symptoms of alcohol abuse and dependence and symptoms of depression using the SCID-I was 1.0. Individuals who were not currently in treatment but who revealed the presence of eating disorder or substance use disorder symptoms were referred for counseling. This study was approved by the University's Institutional Review Board.

Analysis—We tested our hypotheses by comparing the four diagnostic groups, using analysis of variance (ANOVA) and a priori, planned contrasts. We compared groups on the four personality variables, eating and thinness expectancies, and alcohol expectancies. Planned a priori contrasts included a comparison of women who had an eating disorder, regardless of substance use diagnosis, to controls and women with a substance use disorder only on eating and thinness expectancies. Similar planned contrasts were conducted with women who had an alcohol use disorder, regardless of eating disorder status, to controls and women with an eating disorder diagnosis only on alcohol expectancies.

Results

Group Comparisons on the Four Personality Traits that Contribute to

Impulsive Action—We first compared the diagnostic groups on all impulsivity-related personality traits (see Table 2). An overall F test indicated that the groups differed on negative urgency, as hypothesized. The disordered groups endorsed higher levels of negative urgency than the control group, $t(1,100) = 4.14, p < .01$, and none of the three symptomatic groups differed from each other. We did not expect the groups to differ on the other forms of impulsivity, and that was true in two of three cases. They did not differ on either lack of persistence or sensation seeking, but they differed in lack of deliberation. Specifically, the disordered groups endorsed lower higher levels of (lack of) deliberation than the control group, $t(1,100) = 3.26, p < .01$ and the disordered groups were not significantly different from each other.

Group Comparison on Expectancies—We next compared the four groups in their scores on both eating/dieting expectancies and alcohol expectancies (see Tables 3 and 4). Concerning eating and dieting expectancies, the groups differed on the expectancies that eating helps alleviate negative affect (EEI scale 1), eating alleviates boredom (EEI scale 3), and thinness/dieting lead to overgeneralized life improvement (TREI). As expected, the ED and comorbid groups did not differ from each other on any of these three expectancies. Women in the ED/ Comorbid group also obtained higher scores on the three expectancies than the control group; $t(1,70) = 4.85, p < .001$; $t(1,70) = 8.14, p < .001$; $t(1,70) 5.37, p < .001$, respectively. Comparisons between the ED/Comorbid group and the SUD group revealed the same pattern: Women in the former group obtained significantly higher scores on all three expectancies than women in the SUD group. In sum, women with an eating disorder, regardless of drinking status, endorsed significantly higher levels of positive expectancies for eating and restricting than non eating disordered women.

Concerning alcohol expectancies, the four groups differed on all five AEQ scale scores. As expected, the SUD and comorbid groups scored similarly on all expectancies. Women in the SUD/ Comorbid group obtained significantly higher scores than women in the ED group on

the expectancies that alcohol positively transforms a wide variety of experiences, $t(1,87) = 6.46, p < .001$; alcohol enhances sexual experiences $t(1,87) = 3.99, p < .001$; that alcohol facilitates social interactions $t(1,87) = 3.53, p < .001$; and that alcohol induces relaxation $t(1,87) = 2.72, p < .01$. Finally, women in both the SUD/comorbid group obtained significantly higher scores on all expectancies than women in the control group. Women with an alcohol use disorder, regardless of eating disorder status, endorsed significantly higher levels of positive expectancies for drinking than non substance dependent women.

Study One Discussion

The tendency to act rashly in response to negative affect (high levels of negative urgency) characterizes both women with symptoms of bulimia nervosa and alcohol dependence. This finding is consistent with our theory that the trait of negative urgency contributes to the comorbidity of alcohol problems and eating disorders in women, and is also consistent with research indicating that both heavy drinking and binge eating often occur during negative mood states. We also found that lack of deliberation characterizes women with both disorders; it may also contribute to comorbidity. We have not emphasized lack of deliberation, because of previous research indicating that lack of deliberation does not add incremental prediction of addictive behaviors beyond prediction from negative urgency (Smith, Fischer, et al., 2007). Nonetheless, the role of this trait merits further investigation.

It also appears to be the case that, among women with high levels of negative urgency and (lack of) deliberation, different learning histories, manifested in different outcome expectancies, are associated with different behavioral expressions of dysfunction. Alcohol dependent women had high levels of negative urgency and high levels of expectancies for reinforcement from drinking, but not of expectancies for reinforcement from eating or from restricting/thinness. Eating disordered women had high levels of negative urgency and high levels of expectancies for reinforcement from eating or from restricting/thinness, but not of expectancies for reinforcement from drinking.

Comorbidity was associated with high levels of negative urgency and high levels of endorsement of both types of expectancies. While comorbid women endorsed both types of expectancies, we gathered data during the interview process that indicated that for many of them, the onset of one behavior preceded the onset of the other. Hence, it was rare that individuals experienced the onset of diagnosable disorders at the same time. As the data in this study on expectancy endorsement is cross-sectional, we are not able to describe when these expectancies developed. Given previous longitudinal studies that demonstrate that expectancy development often precedes the onset of behavior, it is plausible that women held reinforcing outcome expectancies for both types of behaviors prior to developing symptoms that met full diagnostic criteria for each disorder, whether they developed these expectancies in adulthood or adolescence. Additionally, we have hypothesized that negative urgency is associated with multiple addictive behaviors. It may be that women with high levels of urgency and alcohol dependence, for example, quickly engage in other maladaptive behaviors to cope with negative emotions when they give up drinking. These findings do provide support for our risk model, but it is important to appreciate that, because the design was cross-sectional, it does not permit a rigorous test of a risk model. Had the results been inconsistent with our model, the model would have been undermined; the model survived this initial test. Because the results were consistent with the model, we conclude that the model merits investigation using more rigorous, longitudinal methods.

As stated, we cannot definitively rule out the possibility that the expectancies were formed subsequent to involvement in the maladaptive behaviors: This possibility provides an alternative explanation for the disorder-specific nature of expectancies. However, past research has provided a strong empirical basis for the temporal sequence of personality trait

to learned expectancy to symptomatic behavior. First, negative urgency predicts subsequent increases in alcohol consumption and eating disorder symptomatology (Fischer et al., 2009; Pearson et al., 2011; Settles et al., 2010; Smith & Zapsolski, 2010). Second, negative urgency predicts subsequent increases in alcohol expectancies (Settles et al., 2010), eating expectancies (Pearson et al., 2011), and thinness expectancies (Pearson et al., 2011). Third, alcohol expectancies predict the subsequent onset of problem drinking (Christiansen et al., 1989; Ouellette et al., 1999). Fourth, eating and dieting/thinness expectancies predict the subsequent onset of disordered eating behavior (Combs, Pearson, et al., 2010; Smith, Simmons, et al., 2007). Fifth, experimental manipulations of alcohol expectancies and of dieting/ thinness expectancies lead to reductions in symptoms (Darkes & Goldman, 1993; Annus et al., 2008). The cross-sectional findings of disorder-specific expectancy effects reported here should be understood in light of this past research.

Another important limitation of Study One is that we studied women who already had diagnosable disorders. From this study, we cannot know whether the observed pattern of findings is in part a function of ongoing psychopathology. This possibility may not be likely, given past research. Nevertheless, to address this limitation, we conducted Study Two, in which we tested analogous hypotheses in a sample of fifth grade girls, using the criteria of drinker status and binge eater status in these young girls. Presumably, trait and expectancy levels in fifth grade girls are not a result of ongoing, diagnosable psychopathology.

Study Two

Study Two involved the administration of measures of negative urgency, lack of deliberation, lack of perseverance, sensation seeking, alcohol expectancies, eating expectancies, dieting/thinness expectancies, drinking behavior, and eating disordered behavior to a large sample of girls in their last year of elementary school (fifth grade).

Method

Subjects—Participants in the study ($n = 905$) consisted of fifth grade girls from public school systems in urban, rural, and suburban areas. The ethnic breakdown of the sample was as follows: 60.7% Caucasian, 17.6% African America, 6.3 % Hispanic/Latino, 4.0% Asian, 0.5% Arabic, and 10.9% of students endorsing “Other.” The majority of the fifth grade girls, 66.6%, were age 11; 23.8% were age 10; 9.0% were age 12; and 9 and 13 year olds made up 0.2% and 0.3% of the participants, respectively.

Measures

The UPPS-R-Child version: (Zapolski, Stairs, Settles, Combs, & Smith, 2010) was used to measure negative urgency, lack of deliberation, lack of perseverance, and sensation seeking. Responses to this questionnaire follow a four-point Likert-type format. Zapolski et al. (2010) reported that estimates of internal consistency ranged from .81 to .90 in the development sample; they also found that the four scales had good convergent validity across method of assessment, good discriminant validity from each other, and good criterion-related validity in a sample with a mean age of 10.5. In the current sample, coefficient alpha estimates of internal consistency were negative urgency, .85; lack of deliberation, .77; lack of perseverance, .65¹; and sensation seeking, .79.

¹This coefficient alpha estimate of reliability is low. The child version of this measure, which we used in this study, is shorter than adult versions, resulting in a lower coefficient alpha value. This often occurs in child measurement, and for the sake of completeness we chose to use the measure with children despite this limitation.

Eating expectancy inventory: In this study of children, we measured one eating expectancy: that eating helps one manage negative affect. In previous work, this 7-point Likert scale has proven to be internally consistent and to predict membership in trajectory classes characterized by increased binge eating over time (Smith, Simmons, et al., 2007). In the current study, this 8-item measure was again internally consistent ($\alpha = .92$).

Thinness and restricting expectancy inventory: We used an abbreviated, 8 item version of the TREI in Study Two. The scale uses a 7-point Likert response format. This scale was developed in a series of short-form construction steps. The 8-item version represents each content domain included in the full scale, its median internal consistency across numerous previous samples was high ($\alpha = .93$), its stability across a one-year period of adolescence is comparable to that of the full scale (r values ranging from .45 to .50), and correlations between the 8-item and full scales in separate administrations were the same as were correlations between the full scale in separate administrations (also between .45 and .50 across one year). The internal consistency of the scale in this sample was $\alpha = .92$.

Memory Model-Based Expectancy Questionnaire (MMBEQ): (Dunn & Goldman, 1996) provides an extensive assessment of alcohol expectancies in children. For this study, we assessed two domains: expectancies for positive social and “wild and crazy” behavioral effects of alcohol. The scale begins with the stem, “Drinking alcohol makes people_____.” Children then read items that complete the stem (e.g., “friendly,” “wild”) and then circle one of four responses: “never,” “sometimes,” “usually,” or “always.” Thus, items are scored on a 4-point Likert-type scale. Each of the subscales are correlated with drinking levels and each is internally consistent (α 's = .78 or higher; Dunn & Goldman, 1996, 1998). Sample items and current sample internal consistency reliability estimates are as follows: positive social, 18 items (“friendly,” “fun,” “outgoing”), $\alpha = .84$; wild and crazy (we used 5 of 7 items: “loud,” “crazy”), $\alpha = .73$. The two items we dropped from this scale (Drinking alcohol makes people calm, and Drinking alcohol makes people quiet) are reverse scored. They had very low item-total correlations in this sample and so were removed.

Eating Disorder Examination-Questionnaire (EDE-Q) (Fairburn & Beglin, 1994): The EDE-Q is a self-report version of the EDE. Overall scale scores, subscales scores, and ratings of binge eating and purging frequency from the EDE and EDE-Q have been found to be highly correlated (Fairburn & Beglin, 1994; Grilo, Masheb, & Wilson, 2001). There is considerable evidence for the validity of the EDE-Q, including evidence for convergent validity, good ability to differentiate recurrent from infrequent bingers, and the ability to validly identify weight and shape concerns (Elder, Grilo, Masheb, Rotschild, Burke-Martindale, & Brody, 2006). The questions on the EDE-Q were modified to reflect the past 14 days (from the past 28 days), following prior work with early adolescents (e.g., Carter, Stewart, & Fairburn, 2001).

For the present study, we used EDE-Q reports to identify girls who had engaged in binge eating. Binge eater status was defined by an affirmative answer on two separate questions on the EDE-Q, one asking about the frequency of having eaten a large amount of food while feeling out of control over the past two weeks and another defining binge eating and asking if the participant had ever engaged in the behavior. If the participant had an affirmative answer on both of these questions, then we considered it a stringent representation of binge eating behavior in the sample.

The Drinking Styles Questionnaire (DSQ): (Smith et. al., 1995) was used to measure self-reported drinking. The DSQ can provide scales assessing drinking/drunkenness and problem drinking, and there is good evidence for the reliability and validity of those scales in early adolescents, late adolescents, and adults (Settles et al., 2010; Smith et al., 1995). For this

young sample, we measured drinker status dichotomously. Children were classified as positive for drinking if they reported ever having consumed at least one drink, where a drink was defined as follows: “a ‘drink’ is more than just a sip or a taste. (A sip or a taste is just a small amount or part of someone else’s drink or only a swallow or two. A drink would be more than that.)”

Procedure—The questionnaires were administered in 23 public elementary schools during school hours. A passive consent procedure was used. Out of 978 fifth grade girls in the participating schools, 92.5%, or 905 of all of the girls in the system, participated in the study. A total of 73 girls did not participate due to one of the following reasons: families declined consent, students declined assent, or a variety of other reasons, such as language disabilities that precluded completing the questionnaires. Questionnaires were administered in school classrooms. It was made clear to the students that their responses on the questionnaire were to be kept confidential and no one outside of the research team would see them. The research team introduced the federal certificate of confidentiality for the project and emphasized that they were legally bound to keep all responses confidential. After each participant signed the assent form, the researchers then passed out packets of questionnaires. The procedure took 60 minutes or less. This procedure was approved by the University’s IRB and by the participating school systems.

Analysis—We tested our hypotheses by comparing different groups of girls, using analysis of variance (ANOVA) and a priori, planned contrasts. For the overall F tests, we used the conservative significance level of $p < .001$, given the large sample size. For individual group planned contrasts, we used $p < .05$, because many contrasts involved small numbers of subjects and because each contrast represented an a priori hypothesis. In order to determine whether there was significant covariance among the study variables due to participants attending the same school, we calculated intraclass coefficients for each of our major model components (using school membership, $n = 23$, as the nesting variable). The largest intraclass coefficient was .03 for negative urgency; all other values ranged from .02 to .00. These low values indicate that very little or no shared variance among study variables was due to attending the same school.

Results

Descriptive Statistics—The sample showed a 10.6% rate of binge eating (96 girls). The number of binges over the past two weeks ranged from 1 to 14; the mean was 2.38. A total of 73 girls (8.07%) reported having consumed more than just a sip or taste of alcohol. Concerning the typical quantity consumed, 62 girls (6.9%) reported typically consuming the equivalent of one beer or one drink or less; 6 (0.7%) reported typically drinking between two to three beers or drinks; and 5 (0.5%) reported typically drinking four or more beers or drinks per occasion (see Combs, Smith, et al., in press; Gunn & Smith, 2010, for more detail about these behaviors in the current sample). A total of 17 girls had both drinker and binge eater status.

Group Comparisons on the Four Personality Traits that Contribute to

Impulsive Action—We compared four groups of girls: those who had consumed a full drink and who had engaged in binge eating ($n = 17$, referred to as the comorbid group), those who had consumed a drink but not engaged in binge eating ($n = 56$, referred to as the drinker group), those who had engaged in binge eating but who had not consumed a drink ($n = 79$, referred to as the binge eater group), and those who had done neither ($n = 753$, referred to as the nonsymptomatic group).

The four groups differed on negative urgency. (See Table 5). The three symptomatic groups were higher in negative urgency than the nonsymptomatic group, $t(1,901) = 10.43, p < .001$, and none of the three symptomatic groups differed from each other. The four groups also differed on lack of deliberation. Here, too, the three symptomatic groups were higher in the failure to plan (were less deliberate) than was the nonsymptomatic group, $t(1,901) = 6.60, p < .001$, and the three symptomatic groups did not differ from each other. The groups did not differ on sensation seeking or lack of perseverance. These results were consistent with what was observed among adults in Study One.

Group Comparison on Expectancies—The four groups differed significantly in their endorsement of the expectancy that eating helps one manage negative affect. (See Table 6). The binge eater group and the comorbid group did not differ. As anticipated, those two groups had higher eating expectancy endorsement than did the drinker group, $t(1,901) = 3.49, p < .001$, and higher eating expectancies than the combined drinker and nonsymptomatic groups, $t(1,901) = 4.51, p < .001$.

The groups also differed in their endorsement of the expectancy that dieting and thinness lead to overgeneralized life improvement. Unexpectedly, the comorbid group had higher expectancy endorsement than the binge eater group, $t(1,901) = 3.04, p < .01$. Those two symptomatic groups had higher expectancy endorsement than did the drinker group, $t(1,901) = 5.85, p < .001$, and higher expectancy endorsement than the combined drinker and nonsymptomatic groups, $t(1,901) = 7.49, p < .001$. The same pattern held when we compared only the binge eater group to the drinker group and to the combined drinker and nonsymptomatic groups: in both cases, the binge eater group endorsed more dieting/thinness expectancies ($p < .001$).

Concerning the expectancy that alcohol provides positive social experience, the four groups again differed. The drinker and comorbid groups did not differ. Those two groups endorsed this alcohol expectancy more strongly than did the binge eater group, $t(1,901) = 3.10, p < .001$, and more strongly than did the combined binge eater and nonsymptomatic groups, $t(1,901) = 4.56, p < .001$. A similar pattern was present for the expectancy that alcohol produces wild and crazy behavior. The four groups differed. The drinker and comorbid groups did not differ, and the drinker/comorbid group endorsed this expectancy more strongly than did the binge eater group, $t(1,901) = 2.03, p < .05$ and more strongly than did the combined binge eater and nonsymptomatic groups, $t(1,901) = 3.66, p < .001$. Unexpectedly, the binge eater group endorsed the expectancy more strongly than did the nonsymptomatic group, $t(1,901) = 3.11, p < .01$.

Study Two Discussion

In a very young sample of girls, the two personality traits of negative urgency and lack of deliberation were associated with both alcohol consumption and binge eating. Girls who tend to act rashly when distressed and girls who tend to act without forethought were more likely to have consumed a full drink of alcohol or engaged in binge eating while still in elementary school. Our model proposes that elevated negative urgency is associated with the comorbidity of alcohol problems and eating disorders. These data suggest that among young girls, the same trait is also associated with very early onset of drinking and binge eating.

We had also considered the possibility that lack of deliberation contributed to the comorbidity of the two problem behaviors, although we noted that, in most regression-based risk models, lack of deliberation does not explain risk beyond what is explained by negative urgency (Cyders et al., 2009; Fischer & Smith, 2008; Smith, Fischer, et al., 2007). We did find that lack of deliberation differentiated girls engaging in both types of behaviors from other girls; thus, the possibility that this trait is an important influence on these behaviors

should be pursued further. Indeed, recent reviews considering early temperamental risk factors for psychopathology have considered both the role of impulsivity (lack of deliberation) and some form of emotion dysregulation as joint influences on externalizing behavior (Beauchaine & Neuhaus, 2008; Crowell, Beauchaine, & Linehan, 2009).

As was true among adult women with diagnosed disorders, learned expectancies were behavior-specific. Learned expectancies for reinforcement from eating and from dieting/thinness were associated with early binge eater status, expectancies that drinking alcohol provides positive social experiences and wild and crazy behavior were associated with early drinker status, and those girls engaging in both problematic behaviors endorsed both types of expectancies more strongly than did other girls. These findings are consistent with the model's claim that differences in psychosocial learning relate to the specific risky behavior one becomes involved in. Expectancies are understood to be formed based on both direct and vicarious learning experiences (Bolles, 1972); thus, it seems that different learning histories can be detected in children this young and that the different learning histories are associated with different forms of problematic behavior.

General Discussion

The purpose of the two studies described in this paper was to test a model designed to explain the comorbidity between problem drinking and eating disorders. The model is that negative urgency, the tendency to act rashly in response to distress, is a personality contributor to both forms of dysfunction, and thus helps explain the comorbidity between the two. We also noted that lack of deliberation may play a similar role, although most studies find that lack of deliberation does not contribute to problem drinking or eating disorders beyond prediction from negative urgency². Further, the model also holds that, for women and girls who share this personality risk, learning factors influence whether they engage in problem drinking or eating disordered behavior.

The findings of Study One were fully consistent with our model: both alcohol dependent and eating disordered women were higher in negative urgency and lack of deliberation than were nondisordered women. Because the traits appear to be relatively stable over time, somewhat heritable, and, in the case of negative urgency, predictive of subsequent drinking and eating disordered behavior (Fischer et al., 2009; Jang, McCrae, Angleitner, Riemann, & Livesly, 1998; Pearson et al., 2011; Settles et al., 2010), it is possible that trait elevations contribute to both kinds of disordered behavior. This is consistent with other recent research indicating that both emotion regulation difficulties and impulse control may represent pathways to disorders such as alcohol abuse (Simons, Carey, & Wills, 2009). In Study Two, we did not address diagnosable dysfunction; rather, we tested whether the same traits would be associated with very early onset of both types of problem behavior. The data were consistent with this hypothesis. That finding provides some reassurance that the Study One findings were not a function of the influence of ongoing psychopathology on personality (Widiger & Smith, 2008). Together, these findings provide support for the value of testing this model using rigorous longitudinal studies designs.

In both Study One and Study Two, expectancy endorsement was associated with specific symptom pattern. Both adult women with alcohol dependence and fifth grade girls who had already begun to drink had formed stronger expectancies for reinforcement from drinking

²Two questions not addressed in this study is the relationship between negative urgency and other personality constructs, such as behavioral activation or reactive temperament; and the relationship between lack of deliberation and similar constructs, such as lack of effortful control. Cyders et al. (2007) found that negative urgency fell on a different factor from behavioral activation and Cyders and Smith (2008) provide some discussion of possible relationships between temperament constructs and both of these traits. The relationships among these constructs merit further exploration.

than had others. Similarly, both adult women with eating disorders and fifth grade girls who were engaging in binge eating had formed stronger expectancies for reinforcement from eating and from dieting/thinness than had others. And, in both the adult and child groups, those who were involved in both types of behaviors had formed strong reinforcement expectancies for both behaviors. In light of evidence that alcohol expectancies predict the subsequent onset of drinking and problem drinking (Christiansen et al., 1989) and that eating and dieting/thinness expectancies predict the subsequent onset of eating disorder symptoms (Smith, Simmons, et al., 2007), it is quite plausible that expectancy formation, a marker of psychosocial learning, influences the specific nature of dysfunction in high risk girls and women.

The findings of these two studies should be understood in the context of the studies' limitations. Both studies were cross-sectional and correlational. Although past research has shown prospective effects consistent with our model, we did not test or show such effects here. It is not possible to experimentally manipulate personality to observe its effect on psychopathology. Thus, studies such as these can only provide evidence consistent with a causal model but cannot provide rigorous tests of such models. Additionally, we did not experimentally alter expectancies and examine their influence on symptom levels in these studies. Even though that experimental research has been conducted in the past (Annus et al., 2008; Darkes & Goldman, 1993), we have not demonstrated the validity of any causal hypothesis in this study. It is also certainly possible, perhaps likely, that expectancies both predict the onset of these behaviors and help maintain them over time. Our design does not permit us to separate these two roles or evaluate the relative magnitude of the two possible processes.

We studied only women and girls. Although this focus was a strength of the studies, in that women are at much higher risk for the development of eating disorders than men, it is nevertheless true that this research provides no information about risk processes among men and boys. It is important to test, rather than presume, that the same model applies across sex. Similarly, we did not test the model across different racial or ethnic groups; doing so is clearly necessary.

In summary, the personality disposition to act rashly in response to negative affect, and the tendency to act without deliberation or forethought, appear to be shared features of alcohol and eating problems and may, pending further longitudinal support, contribute to the comorbidity between the two. Differences in psychosocial learning histories, measured as alcohol, eating, and dieting/ thinness expectancies, may help explain the particular behavioral expression of dysfunction.

Acknowledgments

This research was supported by NIAAA grant number 5F31-AA014469-02 to Sarah Fischer, NIAAA grant number 1R01 AA016166 to Gregory T. Smith, and the University of Georgia Research Foundation, and NIDA grant number DA007304 to Regan Settles.

References

- Anestis M, Selby E, Joiner T. The role of urgency in maladaptive behaviors. *Behaviour Research and Therapy*. 2007; 45(12):3018–3029. [PubMed: 17923108]
- Anestis M, Smith A, Fink E, Joiner T. Dysregulated eating and distress: Examining the specific role of negative urgency in a clinical sample. *Cognitive Therapy and Research*. 2009; 33(4):390–397.
- Annus AM, Smith GT, Masters K. Manipulation of thinness and restricting expectancies: Further evidence for a causal role of thinness and restricting expectancies in the etiology of eating disorders. *Psychology of Addictive Behaviors*. 2008; 22:278–287. [PubMed: 18540725]

- Bandura, A. Principles of behavior modification. New York: Holt, Rinehart, & Winston; 1969.
- Beauchaine, TP.; Neuhaus, E. Impulsivity and vulnerability to psychopathology. In: Beauchaine, TP.; Hinshaw, SP., editors. *Child Psychopathology*. Hoboken, NJ: Wiley; 2008. p. 129-156.
- Bolles RC. Reinforcement, expectancy, and learning. *Psychological Review*. 1972; 79:394–409.
- Brown SA, Goldman MS, Inn AM, Anderson L. Expectancies of reinforcement from alcohol: Their domain and relation to drinking patterns. *Journal of Consulting and Clinical Psychology*. 1980; 48:419–426. [PubMed: 7400427]
- Bulik CM, Klump KL, Thornton L, Kaplan AS, Devlin B, Fichter MM, Kaye WH. Alcohol use disorder comorbidity in eating disorders: A multicenter study. *Journal of Clinical Psychology*. 2004; 65:1000–1006.
- Carter JC, Stewart DA, Fairburn CG. Eating disorder examination questionnaire: Norms for young adolescent girls. *Behaviour Research and Therapy*. 2001; 39:625–632. [PubMed: 11341255]
- Christiansen BA, Smith GT, Roehling PV, Goldman MS. Using alcohol expectancies to predict adolescent drinking after one year. *Journal of Consulting and Clinical Psychology*. 1989; 57:93–99. [PubMed: 2925979]
- Claes L, Vandereycken W, Vertommen H. Impulsivity related traits in eating disorder patients. *Personality and Individual Differences*. 2005; 39:739–749.
- Combs JL, Pearson CM, Smith GT. A risk model for pre-adolescent disordered eating. *The International Journal of Eating Disorders*. 2010
- Combs JL, Smith GT, Flory K, Simmons JR, Hill KK. The acquired preparedness model of risk for bulimic symptom development. *Psychology of Addictive Behaviors*. 2010; 24:475–486. [PubMed: 20853933]
- Corbin WP, McNair LP, Carter JA. Evaluation of a treatment appropriate cognitive intervention for challenging alcohol outcome expectancies. *Addictive Behaviors*. 2001; 26:475–488. [PubMed: 11456072]
- Crowell SE, Beauchaine TP, Linehan MM. A biosocial developmental model of borderline personality: Elaborating and extending Linehan's theory. *Psychological Bulletin*. 2009; 135:495–510. [PubMed: 19379027]
- Crowther JH, Sanftner J, Bonifazi DZ, Shepherd KL. The role of daily hassles in binge eating. *International Journal of Eating Disorders*. 2001; 29:449–454. [PubMed: 11285582]
- Cyders MA, Smith GT. Mood based rash action and its components: Positive and negative urgency. *Personality and Individual Differences*. 2007; 43:839–850.
- Cyders MA, Smith GT. Emotion-based dispositions to rash action: Positive and negative urgency. *Psychological Bulletin*. 2008; 134:807–828. [PubMed: 18954158]
- Cyders MA, Flory K, Rainer S, Smith GT. The role of personality dispositions to risky behavior in predicting first year college drinking. *Addiction*. 2009; 104:193–202. [PubMed: 19149813]
- Cyders MA, Smith GT, Spillane NS, Fischer S, Annus AM, Peterson C. Integration of impulsivity and positive mood to predict risky behavior: Development and validation of a measure of positive urgency. *Psychological Assessment*. 2007; 19:107–118. [PubMed: 17371126]
- Dansky BS, Brewerton TD, Kilpatrick DG. Comorbidity of bulimia nervosa and alcohol use disorders: Results from the national women's study. *International Journal of Eating Disorders*. 2000; 27:187–190.
- Darkes J, Goldman MS. Expectancy challenge and drinking reduction: Experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology*. 1993; 61:344–353. [PubMed: 8473588]
- Darkes J, Goldman MS. Expectancy challenge and drinking reduction: Process and structure in the alcohol expectancy network. *Experimental and Clinical Psychopharmacology*. 1998; 6:344–353.
- Dunn ME, Goldman MS. Empirical modeling of an alcohol expectancy memory network in elementary school children as a function of grade. *Experimental and Clinical Psychopharmacology*. 1996; 4:209–217.
- Dunn ME, Goldman MS. Age and drinking-related differences in the memory organization of alcohol expectancies in 3rd, 6th, 9th, and 12th grade children. *Journal of Consulting and Clinical Psychology*. 1998; 66:579–585. [PubMed: 9642899]

- Elder KA, Grilo CM, Masheb RM, Rothschild BS, Burke-Martindale CH, Brody ML. Comparison of two self-report instruments for assessing binge eating in bariatric surgery candidates. *Behaviour Research and Therapy*. 2006; 44:545–560. [PubMed: 15993381]
- Engel SG, Boseck JJ, Crosby RD, Wonderlich SA, Mitchell JE, Smyth J, Miltenberger R, Steiger H. The relationship of momentary anger and impulsivity to bulimic behavior. *Behaviour Research and Therapy*. 2007; 45:437–447. [PubMed: 16697350]
- Fairburn CG, Beglin SJ. Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*. 1994; 16:363–370. [PubMed: 7866415]
- Fairburn, CG.; Cooper, Z. The eating disorder examination. In: Fairburn, CG.; Wilson, GT., editors. *Binge eating: Nature, assessment, and treatment*. 12th ed.. New York, NY: The Guilford Press; 1993. p. 340-360.
- First, MB.; Spitzer, RL.; Williams, JBW.; Gibbon, M. *Structured Clinical Interview of DSM-IV Disorders (SCID)*. Washington, DC: American Psychiatric Association; 1997.
- Fischer S, Anderson KG, Smith GT. Coping with distress by eating or drinking: The role of trait urgency and expectancies. *Psychology of Addictive Behaviors*. 2004; 18:269–274. [PubMed: 15482082]
- Fischer S, Smith GT. Binge eating, problem drinking, and pathological gambling: Linked by common pathways to impulsive behavior. *Personality and Individual Differences*. 2008; 44:789–800.
- Fischer S, Smith GT, Cyders MA. Another look at impulsivity: A meta-analytic review comparing specific dispositions to rash action in their relationship to bulimic symptoms. *Clinical Psychology Review*. 2008; 28:1413–1425. [PubMed: 18848741]
- Fischer, S.; Stojek, M.; Collins, B. Trait urgency interacts with incidences of sexual assault to prospectively predict increases in bulimic symptoms; Poster presented at the annual meeting of the Eating Disorders Research Society; Brooklyn, NY. Sep. 2009
- Goldberg JH, Halpern-Felsher BL, Millstein SG. Beyond invulnerability: The importance of benefits in adolescents' decisions to drink alcohol. *Health Psychology*. 2002; 21:477–484. [PubMed: 12211515]
- Goldman MS, Brown SA, Christiansen BA, Smith GT. Alcoholism and memory: Broadening the scope of alcohol-expectancy research. *Psychological Bulletin*. 1991; 110:137–146. [PubMed: 1891515]
- Grilo CM, Masheb RM, Wilson GT. A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *Journal of Consulting and Clinical Psychology*. 2001; 69:317–322. [PubMed: 11393608]
- Gunn RL, Smith GT. Risk factors for elementary school drinking: Pubertal status and the acquired preparedness model concurrently predict 5th grade alcohol consumption. *Psychology of Addictive Behaviors*. 2010; 24:617–627. [PubMed: 20822192]
- Heatherton TF, Baumeister RF. Binge eating as escape from self-awareness. *Psychological Bulletin*. 1991; 110(1):86–108. [PubMed: 1891520]
- Hohlstein LA, Smith GT, Atlas JG. An application of expectancy theory to eating disorders: Development and validation of measures of eating and dieting expectancies. *Psychological Assessment*. 1998; 10(1):49–58.
- Jang KL, McCrae RR, Angleitner A, Riemann R, Livesley WJ. Heritability of facet level traits in a cross cultural twin sample: Support for a hierarchical model of personality. *Journal of Personality and Social Psychology*. 1998; 74:1556–1565. [PubMed: 9654759]
- Kampfe N, Mitte K. A German validation of the UPPS Impulsive Behavior Scale: Further evidence for a four dimensional model of impulsivity. *European Journal of Psychological Assessment*. 2009:252–259.
- Kane TA, Loxton NJ, Steiger PK, Dawe S. Does the tendency to act impulsively underlie binge eating and alcohol abuse?: An empirical investigation. *Personality and Individual Differences*. 2004; 36(1):83–94.
- Miller J, Flory K, Lynam D, Leukefeld C. A test of the four factor model of impulsivity related traits. *Personality and Individual Differences*. 2003; 34:1403–1418.
- Miller PM, Smith GT, Goldman MS. Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol*. 1990; 51:343–349. [PubMed: 2359308]

- Ouellette JA, Gerrard M, Gibbons FX, Reis-Bergan M. Parents, peers, and prototypes: Antecedents of adolescent alcohol expectancies, alcohol consumption, and alcohol related life problems in rural youth. *Psychology of Addictive Behaviors*. 1999; 13:188–197.
- Pearson CM, Combs JL, Smith GT. A risk model for pre-adolescent disordered eating in boys. *Psychology of Addictive Behaviors*. 2010; 24:696–704. [PubMed: 20822190]
- Pearson, CM.; Combs, JL.; Zapolski, TCB.; Smith, GT. Personality and psychosocial learning predict increased eating disorder symptomatology during the transition into middle school; Paper to be presented at the annual meeting of the Eating Disorder Research Society; Edinburgh, Scotland. Sep. 2011
- Phillips WJ, Hine DW, Marks ADG. Individual differences in trait urgency moderate the role of the affect heuristic in adolescent binge drinking. *Personality and Individual Differences*. 2009; 47:829–834.
- Settles RF, Cyders MA, Smith GT. Longitudinal validation of the acquired preparedness model of drinking risk. *Psychology of Addictive Behaviors*. 2010; 24:198–208. [PubMed: 20565146]
- Sinha R, Robinson J, Merikangas K, Wilson GT, Rodin J, O'Malley S. Eating pathology among women with alcoholism and/or anxiety disorders. *Alcoholism: Clinical and Experimental Research*. 1996; 20:1184–1191.
- Smith G, Fischer S, Cyders M, Annus A, Spillane N, McCarthy D. On the validity and utility of discriminating among impulsivity-like traits. *Assessment*. 2007; 14(2):155–170. [PubMed: 17504888]
- Smith GT, Goldman MS, Greenbaum P, Christiansen BA. The expectancy for social facilitation from drinking: The divergent paths of high expectancy and low expectancy adolescents. *Journal of Abnormal Psychology*. 1995; 104:32–40. [PubMed: 7897051]
- Smith GT, Simmons JR, Flory K, Annus AM, Hill KK. Thinness and eating expectancies predict subsequent binge eating and purging behavior among adolescent girls. *Journal of Abnormal Psychology*. 2007; 116:188–197. [PubMed: 17324029]
- Smith, GT.; Zapolski, TCB. Positive and negative urgency: Personality dispositions for emotion-based rash action; Paper presented at the annual meeting of the American Psychological Association; San Diego, California. Aug. 2010
- Smyth JM, Wonderlich SA, Heron KE, Sliwinski MJ, Crosby RD, Mitchell JE, Engel SG. Daily and momentary mood and stress are associated with binge eating and vomiting in Bulimia Nervosa patients in the natural environment. *Journal of Consulting and Clinical Psychology*. 2007; 75:629–638. [PubMed: 17663616]
- Stice E, Whitenton K. Risk factors for body dissatisfaction in adolescent girls: A longitudinal investigation. *Developmental Psychology*. 2002; 38:669–678. [PubMed: 12220046]
- Swendsen JD, Tennen H, Carney MA, Affleck G, Willard A, Hromi A. Mood and alcohol consumption: An experience sampling test of the self-medication hypothesis. *Journal of Abnormal Psychology*. 2000; 109:198–204. [PubMed: 10895557]
- Todd M, Armeli S, Tennen H. Interpersonal problems and negative mood as predictors of within day time to drinking. *Psychology of Addictive Behaviors*. 2009; 23:205–215. [PubMed: 19586137]
- Tolman, EC. Purposive behavior in animals and men. New York: Century Company; 1932.
- Verdejo-Garcia A, Bechara A, Recknor EC, Perez-Garcia M. Negative emotion driven impulsivity predicts substance dependence problems. *Drug and Alcohol Dependence*. 2007; 91:213–219. [PubMed: 17629632]
- Verdejo-Garcia A, Lozano O, Moya M, Alcazar MA, Perez-Garcia M. Psychometric properties of a Spanish version of the UPPS-P Impulsive Behavior Scale: Reliability, validity, and association with trait and cognitive impulsivity. *Journal of Personality Assessment*. 2010; 92:70–77. [PubMed: 20013458]
- Whiteside SP, Lynam D. Understanding the role of impulsivity and externalizing psychopathology in alcohol abuse: Application of the UPPS Impulsive Behavior Scale. *Personality Disorders: Theory, Research, and Treatment*. 2009; 5:69–79.
- Whiteside SP, Lynam DR. The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*. 2001; 30:669–689.

- Widiger, TA.; Smith, GT. Personality and psychopathology. In: John, O.; Robins, RW.; Pervin, L., editors. Handbook of personality: Theory and research. 3rd ed.. NY: Guilford; 2008. p. 743-769.
- Wolfe WL, Maisto SA. The relationship between eating disorders and substance abuse: Moving beyond co-prevalence research. *Clinical Psychology Review*. 2000; 20:617–631. [PubMed: 10860169]
- Zapolski TCB, Stairs AM, Settles RF, Combs JL, Smith GT. The measurement of dispositions to rash action in children. *Assessment*. 2010; 17:116–125. [PubMed: 19955108]

Table 1**Study One: Participant Demographics**

	Control (n = 14)	ED (n = 40)	SUD (n = 31)	Comorbid (n = 19)
Age	28.36 (5.40)	21.97 (4.37)	36.26 (9.86)	26.68 (11.16)
Race				
White	85.7% (12)	80.0% (32)	74.2% (23)	79.0% (15)
Black	14.3% (2)	5.0% (2)	22.6% (7)	10.5% (2)
Asian	0.0% (0)	2.5% (1)	0.0% (0)	10.5% (2)
Hispanic	0.0% (0)	2.5% (1)	0.0% (0)	0.0% (0)
Biracial	0.0% (0)	5.0% (2)	3.2% (1)	0.0% (0)
Other Ethnicity	0.0% (0)	5.0% (2)	0.0% (1)	0.0% (0)
Education				
No H. S.	0.0% (0)	5.0% (2)	19.4% (6)	0.0% (0)
H. S./GED	0.0% (0)	10.0% (4)	29.0% (9)	31.6% (6)
Some College	21.4% (3)	70.0% (28)	45.2% (14)	47.4% (9)
College Graduate	35.7% (5)	7.5% (3)	6.5% (2)	10.5% (2)
Post College	42.9% (6)	7.5% (6)	0.0% (0)	10.5% (2)

Study One: Results of Planned Contrasts Among Control, ED, SUD, and Comorbid Groups on Personality Variables

Table 2

	Control (<i>n</i> = 14)	ED (<i>n</i> = 40)	SUD (<i>n</i> = 31)	Comorbid (<i>n</i> = 19)	<i>F</i>
Deliberation	18.64 ^a (3.99)	23.65 ^b (6.75)	22.74 ^b (4.99)	26.00 ^b (6.05)	4.46 [*]
Persistence	20.00 (3.11)	19.80 (5.67)	21.26 (4.99)	23.58 (4.48)	2.68
Sensation Seeking	30.93 (8.91)	35.32 (7.72)	31.03 (7.13)	32.26 (8.71)	2.16
Urgency	24.64 ^a (6.64)	31.08 ^b (7.81)	34.61 ^b (6.42)	35.32 ^b (9.15)	7.10 [*]

Note. Group scores are followed by standard deviations in parentheses. Numbers with different subscripts differ at $p < .01$; numbers with the same subscripts do not differ significantly from each other.
^{*} indicates $p < .01$.

Study One: Results of Planned Contrasts Among Control, ED, SUD, and Comorbid Groups on Eating Expectancies and Thinness Expectancies

Table 3

	Control (<i>n</i> = 14)	ED (<i>n</i> = 40)	SUD (<i>n</i> = 31)	Comorbid (<i>n</i> = 19)	<i>F</i>
EEl 1	2.41 (1.25)	4.05 ^a (1.06)	3.34 (1.36)	4.26 ^a (1.35)	7.59 ^{**}
EEl 2	5.39 ^a (.92)	4.36 (1.32)	4.26 (.80)	4.77 (1.17)	4.01 [*]
EEl 3	2.27 (1.32)	5.46 ^a (1.12)	3.44 (1.11)	4.99 ^a (1.50)	32.20 ^{**}
EEl 4	3.45 (1.38)	3.73 (1.61)	3.78 (1.90)	4.08 (1.87)	.35
EEl 5	4.09 (1.51)	4.76 (1.52)	3.98 (1.23)	4.77 (1.58)	2.85
TREI	3.53 (1.44)	5.20 ^a (1.18)	3.97 (1.75)	4.71 ^a (1.56)	11.79 ^{**}

Note. Group scores are followed by standard deviations in parentheses. Numbers with different subscripts differ at $p < .01$; numbers with the same subscripts do not differ significantly from each other. ED = Eating Disorder group; SUD = Substance Use Disorder Group; EEl 1 = Eating alleviates negative affect; EEl 2 = Eating is pleasurable and useful as a reward; EEl 3 = Eating alleviates boredom; EEl 4 = Eating enhances cognitive competence; EEl 5 = Eating leads to feeling out of control; TREI = Thinness and restricting inventory/Thinness leads to overgeneralized life improvement.

* indicates $p < .05$.

** $p < .01$.

Table 4

Study One: Results of Planned Contrasts Among Control, ED, SUD, and Comorbid Groups on Alcohol Expectancies

AEQ	Control (<i>n</i> = 14)	ED (<i>n</i> = 40)	SUD (<i>n</i> = 31)	Comorbid (<i>n</i> = 19)	<i>F</i>
Positive	2.57 (2.90)	6.55 (4.44)	12.2 ^a (3.96)	12.57 ^a (4.00)	27.31 [*]
Sociable	4.14 (3.69)	6.90 (3.36)	8.93 ^a (1.64)	8.42 ^a (2.19)	10.45 [*]
Relax	3.86 ^a (2.57)	5.35 (2.87)	6.47 (1.69)	7.00 (1.59)	6.23 [*]
Sex	1.36 (1.45)	2.20 (1.92)	4.10 ^a (2.49)	3.94 ^a (2.29)	8.60 [*]
Pleasure	5.64 (2.06)	6.70 (2.50)	7.48 (2.12)	7.58 (2.19)	2.73

Note. AEQ = Alcohol Expectancy Questionnaire.

Superscript ^a follows significant planned contrasts: the groups with the superscript were significantly different from the other two groups.

^{*} *p* < .01.

Table 5

Study Two: Mean Endorsement of Impulsivity-Related Personality Traits as a Function of Problem Behavior

	Non-symptomatic (<i>n</i> = 753)	Drinker (<i>n</i> = 56)	Binge eater (<i>n</i> = 79)	Both (<i>n</i> = 17)	<i>F</i>
Negative Urgency	2.10 ^a (.69)	2.75 ^b (.67)	2.69 ^b (.61)	2.95 ^b (.61)	38.33 *
Lack of Deliberation	1.90 ^a (.54)	2.20 ^b (.56)	2.10 ^b (.48)	2.58 ^b (.57)	15.85 *
Lack of Perseverance	2.00 (.48)	2.20 (.53)	1.99 (.39)	2.23 (.68)	4.62
Sensation Seeking	2.54 (3.19)	2.53 (.65)	2.51 (.68)	2.55 (2.92)	0.11

Note. Group mean scores are followed by standard deviations in parentheses. Numbers with different subscripts differ at $p < .05$; numbers with the same subscripts do not differ significantly from each other.

* indicates $p < .001$.

Table 6

Study Two: Mean Endorsement of Expectancies as a Function of Problem Behavior

	Non-symptomatic (<i>n</i> = 753)	Drinker (<i>n</i> = 56)	Binge Eater (<i>n</i> = 79)	Both (<i>n</i> = 17)	<i>F</i>
Eating Expectancy	2.06 ^a (1.23)	2.42 ^a (1.24)	3.08 ^b (1.54)	4.02 ^b (2.17)	27.44 [*]
Thinness Expectancy	2.95 ^a (1.63)	3.03 ^a (1.68)	4.22 ^b (1.72)	5.60 ^c (1.71)	27.36 [*]
PS Expectancy	1.61 ^a (.41)	1.92 ^b (.52)	1.70 ^a (.39)	1.89 ^b (.68)	16.60 [*]
WC Expectancy	2.93 ^a (.48)	3.31 ^b (.60)	3.11 ^c (.50)	3.27 ^b (.49)	15.18 [*]

Note. Group mean scores are followed by standard deviations in parentheses. Numbers with different subscripts differ at $p < .05$; numbers with the same subscripts do not differ significantly from each other. PS: expectancy for positive, social effects from drinking; WC: expectancy for wild and crazy effects from drinking.

^{*} indicates $p < .001$.