2008

MANIPULATION OF POSITIVE EMOTION AND ITS EFFECTS ON NEGATIVE OUTCOMES OF GAMBLING BEHAVIORS AND ALCOHOL CONSUMPTION: THE ROLE OF POSITIVE URGENCY

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Abstract of Dissertation

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The Graduate School
University of Kentucky
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ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Arts and Sciences
at the University of Kentucky

By
Melissa A. Cyders

Lexington, Kentucky

Director: Gregory T. Smith, Ph. D., Professor of Clinical Psychology

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The current pair of experimental studies sought to further validate the role of positive urgency (acting rashly when in an extreme positive emotional state) as a risk factor for impulsive and maladaptive behavior. Previous research has supported the use of emotion-based dispositions to rash action in predicting a wide range of maladaptive acts. However, that research relied on self-reported behavior, thus lacking (1) tight experimental controls and (2) direct observation of risky behaviors. In the two experimental studies described here, I found that, among college students, (1) previous cross-sectional relationships between risk and positive urgency were supported (n = 104), (2) positive urgency significantly predicted negative outcomes on a gambling task following a positive mood manipulation (n = 94), and (3) positive urgency significantly predicted increases in beer consumption following positive mood induction (n = 33). Positive urgency's role was above and beyond previously identified risk factors; these findings combined with prior cross-sectional and longitudinal field studies provide strong support for the role of positive urgency in rash action.

Keywords: Impulsivity, Alcohol, Positive Affect, Risky Behavior, Gambling

Melissa A. Cyders
Student's Signature

June 25, 2008
Date

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Chapter One

Introduction

Recent research has shown that impulsive behavior can be predicted by several different personality traits, including sensation seeking, lack of premeditation, lack of perseverance, negative urgency (impulsive action when in an extreme negative mood), and positive urgency (impulsive action when in an extreme positive mood: Cyders & Smith, 2007; Cyders et al., 2007a; Smith et al., 2007; Whiteside & Lynam, 2001). These five traits do not load on a common, overall factor and they predict different aspects of risky behavior (Cyders & Smith, 2007; Cyders et al., 2007a; Smith et al., 2007; Whiteside & Lynam, 2001).

One novel finding in this research has been that positive mood-based rash action, i.e., positive urgency, is cross-sectionally and prospectively predictive of negative consequences from a wide range of rash acts, as described further below (Cyders & Smith, 2007, in press-a, in press-b; Cyders et al., 2007a; Cyders, Flory, Rainer, & Smith, 2007b; Zapolski, Cyders, & Smith, 2007). Previous risk research that has considered affect has emphasized the role of negative affect; the potentially harmful effects of very positive affect have received little attention. Although recent research has given positive affect-based risk appropriate attention, it has relied on self-reports of rash acts obtained in field studies. The aim of the current set of studies was to test whether additional evidence for the role of positive urgency would be present when observing rash behavior directly, under tight laboratory controls. Specifically, I tested the predictive role of positive urgency in predicting two risky behaviors: gambling and alcohol consumption. I tested

whether positive urgency predicted these behaviors above and beyond prediction by the other four dispositions to rash action.

To introduce these studies, I will first describe a theoretical framework concerning the motivating role of emotional experiences in rash action. This review will include data which suggest that emotions may serve both adaptive and maladaptive functions for individuals' behavior. Second, I will review the existing literature that supports the role of emotion-based impulsivity, i.e. positive and negative urgency, in a wide range of risky behaviors. Finally, I will present specific hypotheses for this pair of studies.

Theoretical Model of Emotions and Rash Action

Emotions are, fundamentally, adaptive, as they serve to motivate one to act (Frijda, 1986). In fact, the verb to emote means, literally, to prepare one for action (Maxwell & Davidson, 2007) and brain areas in which emotions are experienced, such as the amygdala, are functionally linked to motor cortex regions (Morgenson, Jones, & Yim, 1980). Given this association, it is not surprising that emotions may function to modify and influence behavior in adaptive ways. For instance, if one is anxious due to an upcoming exam or important work presentation, this anxiety, when moderate in nature, may serve to motivate one to work diligently and efficiently to prepare for the event. If the anxiety were not present, one would be unlikely to prepare adequately and therefore may fail to complete the task effectively. In general, emotional set point theories have been proposed to describe this relationship: Emotions signal a need to be fulfilled; they motivate action and then one acts in a way to reduce the emotion back the homeostatic

pre-morbid emotional state (Hoeksma, Oosterlaan, & Schipper, 2004; see also Larsen, 2000; Russell, 2003).

Although the fundamental nature of emotions is adaptive, emotions can result in maladaptive behaviors and outcomes, as well. The experience of extreme emotions can deplete one's ability to control behaviors (Muraven & Baumeister, 2000; Tice, Bratslavsky, & Baumeister, 2001) and intense emotions tend to bias decision making in non-rational or, at times, non-advantageous directions (Bechara, 2004, 2005; Dolan, 2007; Dreisbach, 2006; Shiv, Loewenstein, & Bechara, 2005).

There is a great deal of evidence that emotions can, in fact, motivate maladaptive behaviors. Negative affect, such as anxiety and stress, predicts alcohol consumption, drug use, and bulimic behaviors (Agras & Telch, 1998; Colder & Chassin, 1997; Cooper, 1994; Cooper, Agocha, & Sheldon, 2000; Jeppson, Richards, Hardman, & Granley, 2003; Martin & Sher, 1994; Peveler & Fairburn, 1990; Smyth et al., 2007; Swendson et al., 2000). Positive affect has been linked to heavy and high-risk drinking, drug use, sexual encounters, and gambling (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Holub, Hodgins, & Peden, 2005; Kahn & Isen, 1993; Kornefel, 2002; Yuen & Lee, 2003).

Positive affect can also make one more optimistic about positive outcomes of a situation, thus possibly making one more likely to make poor choices (Nygren, Isen, Taylor, & Dulin, 1996; Wright & Bower, 1992). It has been shown that increased positive affect appears to interfere with one's orientation toward the pursuit of one's long-term goals and to increase one's distractibility (Dreisbach & Goschke, 2004). Even more pronounced emotional arousal (whether positive or negative) tends to lead one to have less discriminative use of information (Forgas, 1992; Forgas & Bower, 1987; Gleicher &

Weary, 1991), which can then lead to poor decision-making outcomes (Slovic, Finucane, Peters, & MacGregor, 2004). It therefore appears that both strongly felt positive affect and negative affect can lead to ill-advised action inconsistent with long-term goals.

Rash Action While in Extreme Emotional States: Positive and Negative Urgency

As mentioned above, positive and negative urgency are personality traits that reflect individual differences in an individual's tendency to act in ill-advised ways while experiencing extreme positive and negative emotions, respectively. Research has shown that both positive and negative urgency provide important unique predictive utility in the prediction of a wide range of risky and maladaptive behaviors. I will consider each one here.

Negative urgency has been shown to be a separately defined trait from other impulsive behavior-related traits (Smith et al., 2007; Whiteside & Lynam, 2001) and is represented in the NEO-PI-R (Costa & McCrae, 1992) as the impulsivity facet of Neuroticism. It has been shown to predict certain aspects of risk-taking behaviors: For instance, although sensation seeking is most often related to the frequency of engaging in risky behaviors, negative urgency has been shown to be related to problem levels of involvement in those behaviors (Miller, Flory, Lynam, & Leukefeld, 2003; Smith et al., 2007). Additionally, negative urgency has been shown to be uniquely related to bulimic behaviors, excessive reassurance seeking, drinking alcohol to cope, dependence on cellular phone use, compulsive shopping, problem drinking, problem gambling, and tobacco cravings (Anestis, Selby, Fink, & Joiner, 2007a; Anestis, Selby, & Joiner, 2007b; Billieux, Rochat, Rebetz, & Van der Linden, 2008; Billieux, Van der Linden, & Ceschi, 2007a; Billieux, Van der Linden, D'Acremont, Ceschi, & Zermatten, 2007b; Fischer &

Smith, in press; Fischer, Smith, & Anderson, 2003; Fischer, Smith, & Cyders, 2008; Magid & Colder, 2007; Miller et al., 2003; Smith et al., 2007). Negative urgency also predicts increased severity of medical, employment, alcohol, drug, family, social, legal, and psychiatric problems in individuals with substance dependence (Verdejo-Garcia, Bechara, Recknor, & Perez-Garcia, 2007).

Positive urgency also predicts negative consequences from involvement in risky behaviors. Cyders et al. (2007a) found that positive urgency can be measured reliably and validly and that, in a multitrait multimethod analysis, positive urgency was distinct from other impulsive behavior-related traits. Cyders et al. (2007a) also showed it was associated with unique variance in a wide range of risky behaviors, especially those behaviors likely to occur while in a positive mood. Positive urgency concurrently predicted pathological gambler status; it differentiated control, eating disordered, and alcoholic individuals, with alcoholic individuals endorsing significantly higher levels of the trait; and it interacted with drinking motives to predict problematic levels of alcohol use: Positive urgency related to problem drinking specifically for individuals high in the motive to drink to enhance an already positive mood (Cyders et al., 2007a). Cyders and Smith (2007) found that positive urgency explained variance in risky behaviors undertaken while in a positive mood, and negative urgency explained variance in risky behaviors undertaken while in a negative mood.

Recent longitudinal findings are consistent with these cross-sectional results. Positive urgency predicted increases in problematic and risky behaviors prospectively during the first year of college, including increased gambling behaviors, increased consumption of alcohol, increased negative outcomes experienced from alcohol

consumption, risky sexual practices, increased smoking, and increased drug use (Cyders & Smith, in press-a; Cyders et al. 2007b; Zapolski et al., 2007). Again, positive urgency had unique relations with these risky behaviors: Although sensation seeking prospectively predicted increased frequency of alcohol consumption, positive urgency predicted increases in problems associated with alcohol use and with increased quantity of consumption during any given drinking episode (Cyders et al., 2007b). Additionally, positive urgency uniquely predicted increases in risky behaviors undertaken while in a positive mood, while negative urgency uniquely predicted increases in risky behaviors undertaken while in a negative mood (Cyders & Smith, 2007). Positive urgency predicted increased gambling behaviors, while sensation seeking predicted increased physical risk-taking behaviors (Cyders & Smith, in press-a).

Thus, positive and negative urgency have shown promise both cross-sectionally and longitudinally as predictors of a wide range of risk-taking behaviors. The longitudinal findings may be particularly important because they included controls for other possible causal agents. As promising as these findings have been, the previous studies have important limitations. Perhaps most importantly, they have relied on self-reports of both one's mood state and one's risky behavior.

The Current Study

To strengthen the validity of the inference that positive and negative urgency influence impulsive behavior while in, respectively, a positive mood or a negative mood, it is necessary to experimentally manipulate mood state and show increases in impulsive behavior as a function of urgency status. To demonstrate such an effect with a behavioral measure of impulsivity would indicate that the effects are not limited to self-reports of

impulsive acts. The proposed studies begin to meet this need. I explored the role of positive urgency using an experimental manipulation of mood states and two behavioral indicators of impulsivity: gambling and alcohol consumption.

I chose to focus specifically on positive urgency in relation to these risky actions due to the potential importance of positive emotion-based rash action for a college population. College students are a valuable population for the examination of positive urgency for these reasons. First, adolescence is characterized by high rates of risk taking behavior (Kelley, Schochet, & Landry, 2004). Indeed, adolescent risk taking behavior may have its roots in brain changes characteristic of adolescents across species (Spear, 2000). Second, there is evidence that the rates of some types of risky behavior increase when adolescents leave home (Budde & Testa, 2005). Third, the rates of at least some risky behaviors appear not to differ between late adolescents in college and those not in college (rather, what matters is leaving adult supervision: Budde & Testa, 2005), so college student samples may be reasonably representative for the study of risky behavior. Fourth, the rates of risky behaviors are quite high among college students, so risk-related phenomena can be studied and are of clinical interest (Hingson, Heeren, Winter, & Wechsler, 2005; Wechsler, Moeykens, Davenport, Castillo, & Hansen, 1995). Fifth, college students' risky behavior appears often to be associated with celebrations and good moods: It tends to occur on weekends, college breaks, and times without heavy school demands (Del Boca et al., 2004). Sixth, the above discussed evidence of positive urgency shows strong relationships between positive urgency and a wide range of risky behaviors both cross-sectionally and longitudinally for the college-aged population (Cyders et al., 2007a; Cyders et al., 2007b; Cyders & Smith, in press-a; Zapolski et al., 2007). I did not

examine the role of negative urgency in risky behavior experimentally; that work remains to be done.

I chose two risky behaviors, gambling and alcohol consumption, to focus on in the current examination because they both have been shown to be predicted by positive urgency both cross-sectionally and longitudinally (Cyders et al., 2007a; Cyders et al., 2007b; Cyders & Smith, in press-a; Zapolski et al., 2007). Additionally, both of these behaviors are frequent among college students and tend to lead to negative outcomes in this population (see Del Boca et al., 2004; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; LaBrie, Shaffer, LaPlante, & Wechsler, 2003; Lesieur et al., 1991; Winters, Bengston, Door, & Stinchfield, 1998).

I tested three hypotheses. The first of the three is preliminary to the experimental research and involves self-reported risk-taking acts. I expected to replicate previous findings concerning positive urgency and alcohol consumption: that positive urgency will predict self-reported problems associated with alcohol use, while sensation seeking will predict quantity/frequency and symptoms of alcohol consumption. Relatedly, I expected this pattern also to be present with respect to gambling behaviors: specifically, that sensation seeking will relate to frequency of gambling behaviors and positive urgency will relate to a marker of problematic gambling. My second hypothesis was that experimental mood manipulations will support the role of positive urgency in gambling behaviors, i.e., positive urgency will predict more negative outcomes from gambling while in an experimentally induced positive mood than while in a neutral mood. These two hypotheses will be tested and presented in study one.

My third hypothesis was the topic of study two. I hypothesized that alcohol consumption would be related to positive urgency in an experimental paradigm, such that high levels of positive urgency would predict increased alcohol consumption while in an experimentally induced positive mood, as compared to while in a neutral mood.

Chapter Two

Study One Introduction

Study one concerned risk for problematic gambling behavior. I first replicated the correlational findings concerning problem drinking noted above and extended those to problem gambling. I then used a measure of gambling negative outcomes taken from a computer analog gambling task: the Balloon Analog Risk Task (BART; Lejuez et al., 2002). I tested whether there was a relationship between positive urgency and increases in gambling negative outcomes following a positive mood induction: I expected positive urgency scores to be positively related to increased negative outcomes when one gambles using the BART following positive mood induction, as compared to when one gambles using the BART while in a neutral mood.

Chapter Three

Study One Method

Participants

Participants for study one consisted of undergraduate students at the University of Kentucky who were enrolled in an Introduction to Psychology course. All participants underwent informed consent procedures before participating and received course credit and money for their participation. Participants also underwent experimental debriefing following their participation in the study.

Measures

The Positive Urgency Measure (*PUM*). The PUM (Cyders et al., 2007a) is a 14 item 4-point Likert-type scale used to assess the level of positive urgency (the tendency to act rashly in response to positive mood state) that an individual endorses. Items are designed to assess individual differences in this trait (e.g., When I get really happy about something, I tend to do things that can have bad consequences, I tend to act without thinking when I am really excited, and Others would say I make bad choices when I am extremely happy about something). This scale has been shown to be unidimensional and internally consistent in past and current research (α = .94 in developmental sample, α = .91 in the current sample). It has good convergent and discriminant validity, including under the rigorous test of comparing it to other impulsivity-like constructs (Cyders & Smith, 2007, in press-a; Cyders et al., 2007a, 2007b).

The UPPS Impulsive Behavior Scale-Revised (*UPPS-R*). The UPPS-R (Whiteside & Lynam, 2001) is a 45 item 4-point Likert-type scale used to assess four different types of impulsivity: urgency, premeditation, perseverance, and sensation seeking. Items are

assessed on a scale ranging form 1 (*agree strongly*) to 4 (*disagree strongly*). As has been shown in the past, the scales were internally consistent in the current sample: negative urgency $\alpha = .91$, lack of premeditation $\alpha = .95$, lack of perseverance $\alpha = .81$, and sensation seeking $\alpha = .84$. Sample items for the scales are as follows: When I feel bad, I will often do things I later regret in order to make myself feel better now (negative urgency); I usually think carefully before doing anything (reverse scored - lack of premeditation); I finish what I start (reverse scored – lack of perseverance); I welcome new and exciting experiences and sensations, even if they are a little frightening or unconventional (sensation seeking).

The Self Assessment Manikin Rating Scale (*SAM*). The SAM (Lang, Bradley, & Cuthbert, 1999) was initially developed to judge the affective quality of visual stimuli. Originally derived from Osgood's semantic differential (Osgood, Suci, & Tannenbaum, 1957), the SAM rating scale consists of a graphic figure representing three dimensions depicting the major elements involved in emotion: valence (i.e., degree of pleasure), arousal, and dominance. Participants are instructed to place an "X" over any of the 5 figures on each scale, or in between each figure, to designate their experience of the stimulus, resulting in a 9-pt scale. Participants only completed the valence portion of this task, which asks participants to choose among figures ranging from very sad to very happy.

The Balloon Analog Risk Task (*BART).* The BART (Lejuez et al., 2002) is a computer-based task designed to measure risk-taking and behavioral disinhibition. The task asks participants to inflate virtual balloons in exchange for monetary rewards; participants are told that with each pump they will earn 1 cent. However, each balloon

has a different and unknown explosion point; once the balloon reaches this point, it explodes and the subject loses all the money for this balloon. Balloon explosion points range from explosion on the first pump to explosion on the 128th pump. This task is thought to replicate aspects of real-life risky behavior, in that risky behavior is often rewarded up to a point, but then additional risky behavior results in poorer outcomes. Various aspects of behavioral disinhibition can be measured on this task. Because my interest was negative outcomes from gambling behavior, I chose the number of balloons exploded as my primary measure. However, I also examined two additional behavioral markers of disinhibition: money earned on the task and the average number of pumps per unexploded balloon (Lejuez et al., 2002). Scores on the BART are significantly correlated with scores on self-report measures of risk-related constructs and with the self-reported occurrence of real-world risk behaviors (Lejuez et al., 2002). In addition, riskiness on the BART accounts for significant variance in composites of self-reported risk behaviors beyond that accounted for by demographics and self-reported measures of risk-related constructs (Lejuez et al., 2002). Each participant underwent 30 trials (balloons) of the task during each administration, as suggested by Lejuez, Aklin, Zvolensky, and Pedulla (2003).

Positive and Negative Affect Scale (*PANAS).* The PANAS (Watson, Clark, & Tellegen, 1988) is a twenty item scale devised to measure one's positive and negative affect. The current measure asked participants to rate their current mood on a scale of 1 (not at all) to 5 (extremely). The PANAS has been shown to have high internal validity, convergent validity and discriminant validity (Watson et al., 1988). Two internally consistent scales were used from this measure: an overall positive affect scale (PAS,

average α pre and post mood manipulation = .83) and a two item composite scale which measures elation (ELA, average α pre and post mood manipulation = .83).

Drinking Styles Questionnaire (DSQ). The DSQ (Smith, McCarthy, & Goldman, 1995) gathers information about an individual's alcohol use and provides two subscales. The Drinking Synmptoms Scale includes quantity/frequency of consumption, proportion of time drinking leads to drunkenness, maximum quantity consumed, and physical effects. Cronbach's alpha for the developmental sample was reported as .94 and scores correlated .62 with collateral reports (Smith et al., 1995). The Alcohol-Related Problems Scale includes problems related to arrests, vandalism, and fights with friends and family. For the purposes of the current study, we also utilized a two-item drinking quantity and frequency composite. Cronbach's alpha in the development sample was .84 and scores correlated with .40 with collateral reports (Smith et al., 1995). For the current study sample, the internal consistencies were good: Drinking Symptoms α = .87, Drinking Problems α = .67, and drinking quantity/frequency α = .87.

Self-Reported Gambling Behavior. Items were taken from an 83-item scale that assesses the frequency with which individuals participate in a wide range of risk-taking behaviors (Fischer & Smith, 2004). Items were coded on a 1-5 Likert-type scale, with 1 indicating *never* participating in the behavior and 5 indicating *often* participating in the activity. Six gambling items were chosen for the current study: betting on a sports event, betting on a horse race, betting in a casino, investing money in the stock market, trading or buying stocks on the Internet, and betting money one was unsure how one would pay back. I created a composite of these six items to reflect a sum of self-reported gambling behavior. I do not view these items as alternate expressions of a common, underlying

construct. Instead, I viewed each item as a cause of overall gambling behavior. For that reason, internal consistency does not represent an appropriate means of assessing reliability.

Procedure

Individuals were recruited from a pool of 1,200 undergraduate students enrolled in an Introduction to Psychology course. Participants were telephoned to schedule their session and were informed about the requirements of the study. Ninety-four participants participated in the positive mood induction experiment. For reasons described below, I recruited 10 additional participants to participate in a control, neutral mood induction. All participants were compensated with research credit for their course requirement and also with monetary compensation equal to the amount they earned on the BART task.

Each participant was scheduled for an individual session. When each participant arrived for the study, he or she first completed informed consent procedures, a demographic questionnaire, and the above mentioned scales. Then he or she completed the SAM and PANAS scales, followed by 30 trials of the BART. As part of the positive mood induction procedure, the experimenter explained that they would receive compensation equal to the amount of money they earned while completing the task and would be paid following the task. Following the task, each participant was paid immediately.

Each participant (n = 94) then underwent a combined method positive mood induction procedure. First, he or she participated in a story mood induction procedure in which they were asked to listen to an audiotaped story that aimed to induce a positive mood state. The audiotaped recording consisted of an individual describing a series of

really good things that happened during a day, including, but not limited to, experiencing a sports win, earning a high mark on an exam, getting a free lunch, and having a romantic encounter. The script was recited in second-person and the individual was asked to explicitly imagine and get involved in the situation described and in the feelings suggested. The story induction procedure plus instruction has been shown to have a mean weighted effect size of .73 to induce a positive mood in a meta-analysis performed by Westerman, Spies, Stahl, and Hesse (1996).

Following the story mood induction procedure, the experimenter re-entered the room and the participant completed an imagination mood induction procedure. The instructions were as follows: "Imagine vividly a situation from your life that has put you in an extreme positive mood. Try to re-experience the original perceptions, sensation, and feelings that you experienced during this elated mood. Please write down on this piece of paper the feelings, emotions, and thoughts you experienced while in this positive mood and why. Also explain what you did in response to this positive mood. Please begin writing when I leave the room and continue to do so until I return. Remember, continue to really experience this good mood while writing." The participant was then given 10 minutes to write about their experience. The imagination mood induction procedure has been shown to have a mean weighted effect size of .36 to induce a positive mood in a recent meta-analysis (Westerman et al., 1996). Following this, the experimenter re-administered the SAM and PANAS scales.

At this time, the participant completed 30 more trials of the BART and was compensated as before. The participant was then debriefed and awarded credit for participating in the experiment. Each participant was returned to a relaxed mood state, via

an audiotaped neutral mood meditation exercise, in order to reduce likelihood of impulsive action in response to their positive mood state. This exercise lasted 5 minutes.

An additional 10 participants were assigned to a neutral mood condition, in order to validate the effect of the positive mood induction procedures chosen in the current study. These participants were administered the same protocol as explained above, except for the audiotaped recording and writing exercise. For this group, the audiotaped recording involved listening to an individual describe the events of a typical day (i.e., nothing particularly good or bad occurred); the writing exercise asked each participant to write about a typical day for him or her.

Chapter Four

Study One Results

Sample Demographics

The final study sample consisted of a total of 104 participants. The mean age was 19.22 years (*SD* = 3.25) and the sample was equally divided between males and females. Eighty-four percent of the sample indicated their race as European-American, 9% African-American, 5% Asian-American, and 2% indicated Other. The majority of the sample was first-year college students (69.2%).

Correlations between Impulsivity-Related Traits and Self-reported Drinking and Gambling

I began by examining the bivariate correlations among the following variables: the five impulsivity-related traits (positive urgency, negative urgency, sensation seeking, lack of premeditation, and lack of perseverance); a set of drinking variables, including drinking quantity/frequency, drinking symptoms, and drinking problems; and a set of gambling behaviors, including betting on a horse race, betting in a casino, betting on a sports event, investing money in the stock market, trading or buying stocks on the Internet, and betting money you didn't know how you would pay back. I also correlated the five traits with the six-item composite of the gambling behaviors. These correlations are presented in 4.1.

First, concerning drinking: Drinking symptoms were related to positive urgency ($r = 0.30$, $p < .05$), negative urgency ($r = 0.37$, $p < .001$), sensation seeking ($r = 0.33$, $p < .001$), and lack of premeditation ($r = 0.22$, $p < .05$). Drinking problems were related to positive urgency ($r = 0.34$, $p < .001$) and negative urgency ($r = 0.39$, $p < .001$). Drinking

quantity/frequency was related to positive urgency ($r = 0.28$, $p < .05$), negative urgency ($r = 0.37$, $p < .001$), sensation seeking ($r = 0.31$, $p < .001$), and lack of premeditation ($r = 0.22$, $p < .05$).

For the gambling variables, bivariate correlations indicated that sensation seeking ($r = 0.32$, $p < .001$) was significantly related to betting on a sports event; positive urgency ($r = 0.24$, $p < .001$) was related to betting money you didn't know how you would pay back; and positive urgency ($r = 0.21$, $p < .05$) and sensation seeking ($r = 0.27$ $p < .05$) were related to the six-item gambling composite.

I then conducted a series of multiple regression analyses, in order to examine the concurrent prediction roles of each trait when controlled for its overlap with the others. For the alcohol use behaviors, I conducted analyses with the following self-reported dependent variables: drinking symptoms, the drinking quantity and frequency composite, and drinking problems. I conducted each of these analyses in two ways. First, I included all five impulsivity-related traits in each prediction equation. Second, I repeated the analyses after removing negative urgency from the models. Negative urgency and positive urgency are two facets of an overall disposition toward emotion-based rash action (Cyders & Smith, 2007). Because they are highly correlated, they tend to predict redundant variance in many risky behaviors when mood valence is not part of the criterion (Cyders & Smith, 2007, in press-a). Since the focus of this research was the role of positive urgency, I investigated its role, both controlled for and uncontrolled for its companion facet.

I first concurrently predicted the set of drinking variables to test whether prior findings would be replicated (Cyders et al., 2007b). Sensation seeking ($\beta = 0.31$, $p <$

.001) and negative urgency ($\beta = 0.34$, $p < .05$) were related to self-reported drinking symptoms with all five traits in the model; only sensation seeking was significant with the four traits in the model ($\beta = 0.29$, $p < .05$). Negative urgency ($\beta = 0.36$, $p < .05$) and sensation seeking ($\beta = 0.30$, $p < .05$) predicted drinking quantity/frequency with all five traits in the model; only sensation seeking was predictive with the four traits in the model ($\beta = 0.28$, $p < .05$). Only negative urgency predicted drinking problems ($\beta = 0.34$, $p < .05$) with all five traits in the model; only positive urgency predicted when negative urgency was removed ($\beta = 0.32$, $p < .05$). These analyses are presented in Table 4.2.

To test whether sensation seeking and positive urgency differentially predicted gambling behaviors, I proceeded as follows. I viewed betting money on a sports event as a marker of relatively common gambling behavior. I viewed betting money you don't know how you would pay back differently as a marker of problem gambling behavior. The composite six-item scale, then, included indicators of both common, frequent betting and problem gambling. I therefore expected both sensation seeking and positive urgency to predict the composite scale, sensation seeking to predict betting money on a sports event, and positive urgency to predict betting money you don't know how you would pay back. These hypotheses were confirmed. For the gambling composite, sensation seeking ($\beta = 0.26$, $p < .05$) and positive urgency ($\beta = 0.30$, $p < .05$) were both significant predictors, and no other traits added predictive power. Only sensation seeking significantly predicted betting on a sports event ($\beta = 0.32$, $p < .05$). These analyses are presented in Table 4.3.

Because the base rate of betting money you didn't know how you would pay back was quite low (10 individuals out of 104 did so), I collapsed that outcome to a

dichotomous score of ever having done so versus never having done so. I then predicted that outcome using binary logistic regression. Only positive urgency predicted the presence/absence of having engaged in this behavior significantly ($p < .05$). The odds ratio was 3.96: With each one unit increase in positive urgency score, one was 3.96 times as likely to report having engaged in that behavior. (In parallel to the drinking analyses, I then predicted the same outcome after removing positive urgency. Neither negative urgency nor any other variable predicted the outcome with positive urgency excluded.) This analysis is presented in Table 4.4.

Analyses Preliminary to the Experimental Procedure

In order to examine the role of positive urgency experimentally, I first conducted a series of bivariate correlation analyses to see whether individual differences in positive urgency were related to individual differences in baseline mood, prior to exposure to the laboratory manipulation. They were not. Positive urgency was not correlated with SAM rating (1 item; higher scores indicate less positive mood), the PANAS overall positive affect scale (PAS – 8 items; higher scores indicate more positive mood), and a composite scale that indicated elation (ELA – 2 items; higher scores indicate more elated mood) prior to the mood manipulation. Next, I tested whether individual differences in positive urgency were related to individual changes in mood following the positive mood manipulation. Again, they were not: Positive urgency was unrelated to post-manipulation SAM, PANAS, and ELA scores and it was also unrelated to changes in the pre- to post-manipulation SAM, PANAS, and ELA scores. Finally, I examined the following dependent variables: the number of balloons popped in the pre-mood induction BART, the amount of money earned in the pre-mood induction BART, and the average number

of pumps on unexploded balloons in the pre-mood induction BART. Positive urgency was unrelated to any of these variables pre-positive mood induction

Finally, in order to validate the mood induction procedure, I compared the positive mood induction group (n = 94) with a comparison neutral mood induction group (n = 10); the groups did not differ on any of the self-reported mood variables before the administration of the mood induction procedure (SAM t = 0.14, p = *ns*; PAS t = 0.74, p = *ns*; ELA t = 1.29, p = *ns*). 2X2 ANOVAs indicated significantly increased positive mood report following positive mood induction than following neutral mood induction (see Table 4.5).

Effect of Experimental Positive Mood Induction on BART as Predicted by Personality

I next conducted a series of multiple regression analyses to examine the experimental effect of the positive mood induction on BART performance as a function of reported tendencies toward rash action (Table 4.6). My primary dependent variable was the change in the number of balloons popped from pre-mood induction BART to post-mood induction BART; this change is a marker of increased negative outcome gambling while in a positive mood. I also investigated two other outcome variables for exploratory purposes: change in the amount of money earned from pre-mood induction BART to post mood-induction BART, and the change in the average number of pumps on unexploded balloons from pre-mood induction BART to post mood-induction BART. I included as the independent variables the five impulsivity-related traits in the same step of the regression analysis to control for the overlap positive urgency may have with these other rash action traits.

For the change in the number of balloons exploded, only positive urgency predicted an increase in the number of balloons exploded pre and post mood induction ($\beta = 0.25$, $p < .05$), thus confirming the core hypothesis for study one. Interestingly, sensation seeking predicted an interesting difference following positive mood induction: a decrease in the average number of pumps per unexploded balloon ($\beta = -0.22$, $p < .05$) and a decrease in the amount of money earned ($\beta = -0.26$, $p < .05$). High scores on sensation seeking predicted less gambling and reduced earnings following positive mood induction.

Table 4.1

Bivariate correlations of study variables for the study 1

	PUR	NUR	SS	LPL	LPS	HR	CS	SP	SM	INT	PB	GAM	DS	DQF	DP
PUR		.71**	.28*	.48**	.22*	.17	.12	.08	-.01	.16	.24*	.21*	.30*	.28*	.34**
NUR			.14	.55**	.35**	.05	.10	.09	-.07	.09	.13	.09	.37**	.37**	.39**
SS				.25*	-.03	.15	-.00	.32*	.09	.15	.17	.27*	.33**	.31**	.16
LPL					.48**	-.20*	.05	.09	-.09	.02	.10	-.04	.22*	.22*	.14
LPS						-.22*	-.08	-.13	-.01	.02	.05	-.14	-.02	-.04	.10
HR							.37**	.34**	.04	-.01	.03	.61**	.37**	.41**	.36**
CS								.28*	.14	-.02	-.06	.51**	.12	.19	.19
SP									.02	-.08	.08	.51**	.15	.21*	.09
SM										.64**	-.00	.63**	.09	.15	.12
INT											.39**	.59**	.21*	.21*	.16
PB												.32**	.11	.07	.19
GAM													.34**	.41**	.35**
DS														.97**	.54**

DQF	.53**
DP	

Note. PUR = positive urgency, NUR = negative urgency, LPL = lack of planning, LPS = Lack of perseverance, SS = sensation seeking, HR = betting on a horse race, CS = betting in a casino, SP = betting on a sports event, SM = investing in the stock market, INT = trading or buying stocks on the Internet, PB = betting money one didn't know how they would pay back, GAMB = 6 item gambling composite, DS = self-reported drinking symptoms, DQF = self-reported drinking quantity and frequency composite, and DP = self-reported drinking problems.

Note. ** $p < .001$, * $p < .05$

Table 4.2

Multiple regressions of self-report drinking variables on impulsivity traits

	B	SE B	β	Total R^2
1. Dependent variable: Drinking/Drunkenness symptoms				0.23**
LP	0.49	1.85	0.03	
NUR	3.59*	1.49	0.34	
SS	3.94*	1.24	0.31	
LPS	-2.27	1.78	-0.14	
PUR	-0.38	1.54	-0.03	
2. Dependent variable: Drinking/Drunkenness symptoms				0.18**
LP	1.56	1.84	0.10	
SS	3.71*	1.26	0.29	
LPS	-1.59	1.80	-0.10	
PUR	1.92	1.24	0.17	
1. Dependent variable: Drinking Problems				0.17*
LP	-0.37	0.32	-0.14	
NUR	0.62*	0.26	0.34	
SS	0.25	0.22	0.12	
LPS	0.07	0.31	0.02	
PUR	0.22	0.27	0.12	
2. Dependent variable: Drinking Problems				0.12*
LP	-0.18	0.32	-0.07	
SS	0.21	0.22	0.10	

LPS	0.19	0.32	0.07	
PUR	0.62*	0.22	0.32	
1. Dependent variable: Drinking Quantity and Frequency				0.24**
LP	0.23	0.69	0.04	
NUR	1.44*	0.56	0.36	
SS	1.41*	0.46	0.30	
LPS	-1.00	0.67	-0.16	
PUR	-0.28	0.58	-0.07	
2. Dependent variable: Drinking Quantity and Frequency				0.19**
LP	0.66	0.69	0.12	
SS	1.31*	0.48	0.28	
LPS	-0.73	0.68	-0.12	
PUR	0.64	0.47	0.15	

Note. PUR = positive urgency, NUR = negative urgency, LP = lack of premeditation, LPS = Lack of perseverance, and SS = sensation seeking.

Note. ** $p < .001$, * $p < .05$

Table 4.3

Multiple regressions of gambling outcome behaviors on impulsivity traits

	B	SE B	β	Total R^2
Dependent variable: 6 item gambling composite				0.16*
LP	-1.46	0.84	-0.22	
NUR	-0.16	0.69	-0.03	
SS	1.43*	0.57	0.26	
LPS	-0.41	0.81	-0.06	
PUR	1.47*	0.70	0.30	
Dependent variable: Betting on a Sports Event				0.13*
LP	0.08	0.26	0.04	
NUR	0.14	0.21	0.10	
SS	0.55**	0.18	0.32	
LPS	-0.29	0.25	-0.13	
PUR	-0.07	0.22	-0.43	

Note. PUR = positive urgency, NUR = negative urgency, LP = lack of premeditation, LPS = Lack of perseverance, SS = sensation seeking.

Note. ** $p < .001$, * $p < .05$

Table 4.4

Logistic regression of betting money you didn't know how you would pay back on impulsivity traits

	B	SE B	Odds Ratio
PUR	1.376*	0.83	3.96
NUR	-0.01	0.95	0.99
SS	0.49	0.89	1.64
LPS	0.32	1.09	1.38
LP	-0.39	1.19	0.68
Constant	-6.45**	3.46	
χ^2		5.61	
df		5	

Note. PUR = positive urgency, NUR = negative urgency, LP = lack of premeditation, LPS = Lack of perseverance, SS = sensation seeking.

Note. ** $p < .001$, * $p < .05$

Table 4.5

2X2 ANOVA analyses for self-reported mood changes pre and post mood manipulation in study one

SAM[a]	Pre-induction mean (SD)		Post induction mean (SD)
Control group	3.36 (1.12)		3.55 (0.93)
Positive group	3.36 (1.26)		2.19 (1.10)
Within-subjects	SS	df	F
SAM rating	4.80	1	11.7**
SAM*Group	8.97	1	21.84**
Error	39.01	95	
Between-subjects	SS	df	F
Intercept	756.51	1	325.06**
Group	9.053	1	3.89*
Error	221.11	95	

PANAS POS scale[b]	Pre-induction mean (SD)		Post induction mean (SD)
Control group	19.45 (5.54)		17.18 (6.18)
Positive group	20.82 (5.81)		23.11 (6.47)
Within-subjects	SS	df	F
PANAS rating	0.00	1	0.00

PANAS*Group	101.96	1	7.83*
Error	1302.38	100	
Between-subjects	SS	df	F
Intercept	31853.36	1	513.92**
Group	261.32	1	4.22*
Error	6198.08	100	

PANAS ELA scale[b]	Pre-induction mean (SD)		Post induction mean (SD)
Control group	14.27 (5.22)		13.27 (4.00)
Positive group	16.42 (5.20)		20.86 (6.25)
Within-subjects	SS	df	F
PANAS rating	58.05	1	4.34*
PANAS*Group	145.19	1	10.84**
Error	1339.21	100	
Between-subjects	SS	df	F
Intercept	20616.95	1	408.87**
Group	464.48	1	9.21*
Error	5042.43	100	

Note. * $p < .05$. ** $p < .01$.
[a] higher scores indicate less positive mood reported; [b] higher scores indicate more positive mood reported

Table 4.6

Multiple regressions of BART outcome measures on impulsivity traits

	B	SE B	β	Total R^2
Dependent variable: Change in number of exploded balloons (Trial 2 – Trial 1)				
				0.08
LP	-0.82	0.60	-0.19	
NUR	0.12	0.50	0.04	
SS	0.18	0.42	0.05	
LPS	0.09	0.60	0.02	
PUR	0.81*	0.50	0.25	
Dependent variable: Change in money earned (Trial 2 – Trial 1)				0.09
LP	38.36	33.08	0.16	
NUR	-25.38	27.29	-0.15	
SS	-52.17*	22.85	-0.26	
LPS	-12.72	33.08	-0.05	
PUR	-6.69	27.21	-0.04	
Dependent variable: Change in average pumps on unexploded balloons (Trial 2 – Trial 1)				0.06
LP	-3.34	37.06	-0.01	
NUR	3.81	30.57	0.02	
SS	-48.83*	25.59	-0.22	
LPS	-11.22	36.74	-0.04	
PUR	-13.07	30.48	-0.07	

Note. PUR = positive urgency, NUR = negative urgency, LP = lack of premeditation, LPS = Lack of perseverance, and SS = sensation seeking; ** $p < .001$, * $p < .05$

Chapter Five

Study One Discussion

Self-report, Correlational Findings

The current study generally supports previous cross-sectional findings of the relationships among the different tendencies toward rash action and drinking behaviors, with a few exceptions. In the concurrent prediction of problem drinking, the two urgency traits were the only predictive traits. Neither sensation seeking nor any other trait added to prediction of drinking problems provided by negative urgency or by positive urgency (when negative urgency was excluded). This finding does replicate previous work (Cyders & Smith, 2007; Cyders et al., 2007b). However, for drinking symptoms and drinking quantity/frequency, both sensation seeking and negative urgency were significant predictors. These findings are mixed in the degree to which they replicate prior work; previous work has suggested that only sensation seeking predicts these outcome variables (Cyders et al., 2007a, 2007b; Fischer & Smith, in press, 2004; Fischer et al., 2003). I, alternately, found that negative urgency added predictive power to that provided by sensation seeking for both drinking symptoms and drinking quantity/frequency. However, when negative urgency was excluded, there was clear differential concurrent prediction between sensation seeking (quantity/frequency, drinking symptoms) and positive urgency (drinking problems).

For gambling behaviors, however, the current findings extended the differential roles of positive urgency and sensation seeking to gambling behaviors. Only positive urgency predicted betting money one doesn't know how one would pay back, my chosen marker of problem gambling. With each one unit increase in positive urgency score, one

was almost four times as likely to have engaged in this problematic gambling behavior. As hypothesized, sensation seeking had a different role: It covaried with a common gambling behavior, betting on sports events, but not with my marker of problem gambling.

These findings provide additional support for the contention that sensation seeking prompts individuals to engage in risky actions with greater frequency, but positive urgency results in problem levels of involvement in risky behaviors. I return to this point in my subsequent discussion of the results of the laboratory study. However, it is important to note that this distinction between the traits with respect to drinking behavior, though observed in previous studies (Cyders et al., 2007b), was not as clear in these data. The distinct roles of sensation seeking and positive urgency were present as hypothesized, but only when negative urgency was excluded from the prediction models.

Laboratory Study Findings

One interesting finding from study one was that variation in positive urgency was not associated with variation in baseline mood state. It does not appear to be true that positive urgency is associated with baseline positive mood. This finding is consistent with factor analytic findings demonstrating the trait is unrelated to extraversion as measured by the NEO-PI-R (Costa & McCrae, 1992) and its facets, including positive emotions (Cyders & Smith, in press-b). Perhaps positive urgency reflects a tendency to act rashly when experiencing very positive emotions, but not a tendency to experience those emotions more often than do others. Additionally, since positive urgency was unrelated to reported change in mood following positive mood induction, it doesn't

appear that individuals high in this trait experienced more extreme emotional states in this setting than did those low in positive urgency.

As for the positive mood manipulation, it appears that the combined method induction effectively altered the participants' moods in a positive direction, as compared to the baseline measures and as compared to the control neutral mood group. My use of a positive mood induction procedure with combined methods, which was shown to be effective in prior research (see Westerman et al., 1996), was reasonably successful in the current project.

In the laboratory manipulation, my expectation that positive urgency would predict increases in negative outcomes from gambling was supported: Positive urgency was the only significant predictor of increased number of balloons popped following positive mood induction. I believe that this finding replicates the relationships found in cross-sectional and longitudinal research. Specifically concerning gambling behavior, there is now evidence that positive urgency is the only one of the five traits that predicts increased gambling across the first year of college (Cyders & Smith, in press-a), that can differentiate problem from non-problem gamblers (Cyders et al., 2007a), and that can predict increased negative outcomes in a laboratory gambling task.

Additionally and surprisingly, I also found that sensation seeking predicted a reduced level of impulsive action on the BART following positive mood induction: Higher levels of sensation seeking were associated with reducing balloon pumps and earning less money following the mood induction. Although I cannot be certain as to why this finding occurred, three options seem possible. One is that sensation seeking is negatively affected by emotional states; I know of no literature supportive of this

possibility. The second, and perhaps more plausible, hypothesis is that high sensation seekers may have altered their strategy on the BART in response to their neutral mood performance, which occurred previous to their performance while in a positive mood. However, I do not know why sensation seeking, and not other traits, would predict such a strategy change. The third possibility is that the finding is a false positive that will not replicate. These possibilities should be examined in a future study.

Regardless, high levels of positive urgency predicted a negative outcome of popping more balloons while in a positive mood than while in a neutral mood. Study one provides the first demonstration that positive urgency predicts problematic involvement in a risky behavior as measured by direct observation of the behavior, rather than as measured by self-report of past behaviors. To obtain findings that consistently support the theorized role for positive urgency across these two methods of investigation increases confidence in the theory.

Finally, it is interesting to note that positive urgency was not related to an increased average number of pumps for unexploded balloons; rather, it was related to a negative outcome of the task: popping more balloons. Thus, it might be that positive urgency's unique role in gambling is not in increasing the frequency of gambling behaviors or persistence in gambling tasks. Instead, positive urgency seems to increase the risk of negative outcomes of behaviors, even in the laboratory setting. This relationship has been shown in previous cross-sectional and longitudinal research (Cyders et al., 2007a; Cyders et al., 2007b; Cyders & Smith, in press-a; Cyders & Smith, 2007) and further supports the distinctive and important role of positive urgency in risk-taking behaviors.

Chapter Six

Study Two Introduction

Study two examined the role of positive urgency and positive mood experiences in alcohol consumption. I made the following hypotheses for this study: that positive urgency would be unrelated to alcohol consumption during a neutral mood induction and that positive urgency would predict increased alcohol consumption following positive mood induction.

Chapter Seven

Study Two Method

Participants

Participants for study two consisted of undergraduate students at the University of Kentucky who were enrolled in an Introduction to Psychology course. All participants were at least 21 years of age and underwent informed consent procedures before participating. They received course credit and money for their participation. Participants also underwent experimental debriefing following their participation in the study.

Measures

The Positive Urgency Measure (PUM; Cyders et al., 2007a). The PUM was used in study 1 and is described above. The measure was internally consistent in the current sample ($\alpha = .95$).

The UPPS Impulsive Behavior Scale-Revised (UPPS-R; Whiteside & Lynam, 2001). The UPPS-R was used in study 1 and is described above. The scales have been shown to be internally consistent in the current sample: negative urgency $\alpha = .89$, lack of premeditation $\alpha = .87$, lack of perseverance $\alpha = .87$, and sensation seeking $\alpha = .89$.

The Self Assessment Manikin Rating Scale (SAM; Lang et al., 1999). The SAM was used in study 1 and is described above.

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). The PANAS was used in study 1 and is described above. The average internal consistency for the PAS scale was $\alpha = .89$ and the average internal consistency for the ELA scale was $\alpha = .85$ in the current study.

Procedure

Forty-five participants were recruited through an Introduction to Psychology course at the University of Kentucky. Participants were contacted by phone screening. During the phone screening, participants were asked to participate in an experiment examining the alcoholic preferences of undergraduates. Only participants who endorsed (1) being at least 21 years old, (2) being at least a social drinker (3 or more drinks per week), and (3) enjoying drinking beer were asked to participate. Participants were asked to not drink alcohol the day of the study and females were asked to not participate if they are pregnant (and were told that they would need to complete a pregnancy test the day of the experiment). Participants were informed that they would be asked to participate in two sessions, during which they would complete questionnaires, participate in some writing and computer exercises, and drink beer. Participants were informed that they would be provided with snacks, magazines, and movies to watch while their blood alcohol level returns to a legal level and that they should save a total of 3 hours per session. Participants were asked to schedule their sessions on days in which they do not have any important obligations (e.g., tests, etc), were asked to not schedule their sessions on days before major obligations as well, and were required to have at least 48 hours between sessions. Sessions were held in a drinking lounge (e.g., couch, TV, videos, music) at the University of Kentucky. Test sessions were held between 2pm and 9pm; all participants were tested individually and received $10 and research credit for their participation in each session.

When individuals arrived for the study, they were required to show photo identification to verify that they were at least 21 years of age. They completed informed

consent procedures, a field sobriety test, a demographic questionnaire, and the above mentioned scales. Females also completed a urine pregnancy test. All participants underwent an initial BAC level assessment using a breath analyzer test and a urinalysis drug screen. Individuals who were pregnant, who tested positive for illicit drug use, or who did not have a BAC of 0 at the beginning of the study were dismissed.

Participants then completed the 30 trials of the BART task. Participants were counterbalanced as to session order, with half of the participants receiving positive mood induction in session 1 and the neutral mood induction in session 2. Participants assigned to the positive mood condition received compensation for the BART performance underwent the positive mood induction procedures as described in study one. Participants in the neutral mood condition received no compensation for their BART performance and completed the neutral mood induction procedures, as described in study one.

Following this, all participants, regardless of mood condition, were told that I would like to study beer preferences of undergraduate students in order to determine which type of beer to use in a future study. Thus, they were asked to consume four different beers and rate them on different aspects, such as flavor, aroma, and color. They were told that I am also interested in the effects the beer consumption would have. Participants were placed in a room with four different beer choices. Two different types of non-alcoholic beer and two types of alcoholic beers were used as options to minimize the level of drunkenness and, therefore, risk, for participants. Each beer was color coded so the participant did not know which beers they were sampling. Participants spent 90 minutes drinking as much beer or as little beer as they would like. Participants were

asked to rate the beers on several dimensions (e.g., overall taste, sweetness, would you buy this drink).

At the end of the 90 minutes, participants underwent a field sobriety test and a BAC reading. Participants completed the subjective effects of alcohol scale. When a subject left, the amount of beer consumed was recorded. Participants were not allowed to leave until their BAC reached below 0.02.

Procedures for the second session were identical to the first, except that participants underwent the second mood induction condition (whichever one they did not participate in at the first session). At the end of the session, the experimenter debriefed each participant and provided credit for their participation.

Chapter Eight

Study Two Results

Sample Demographics and Preliminary Analyses

The study sample consisted of a total of 45 male and female participants. However, 12 individuals were dismissed from the study due to positive drug screens and self-reported illness upon arrival for at least one of their sessions. Therefore, the final study sample consisted of a total of 33 participants. The mean age was 22.27 years (*SD* = 2.36), with 57.6% of the sample male. Ninety percent of the sample indicated their race as European-American, 3% African-American, 3% Asian-American, and 3% indicated Other. Participants were 2nd year (1), 3rd year (14), fourth year (11) and fifth year (7) students. There was an average of 16.9 days (SD = 17.3) between participants' two sessions. Correlations between positive urgency and the demographic variables indicate that positive urgency was related negatively to age: $r = -0.38$, $p < .05$, but not related to any other demographic variable. Participants on average drank 663.58 ml of beer during the neutral session (SD = 370.82 ml) and 811.33 ml of beer during the positive mood session (SD = 462.33 ml).

I next conducted a series of analyses to examine the relationship between the experimental mood manipulation and resulting reported mood changes. I examined the same three mood scales as in study one: SAM, PAS, and ELA. Participant ratings on the SAM ($t = 1.14$, $p = ns$), the PAS ($t = -1.25$, $p = ns$) and the ELA ($t = -0.47$, $p = ns$) pre neutral mood induction did not differ from ratings pre positive mood induction. Pre neutral mood ratings and post neutral mood ratings did not differ significantly on any of the three scales: the SAM ($t = .77$, $p = ns$), ELA ($t = .87$, $p = ns$), and the PAS ($t = 0.76$, p

= *ns*). Pre positive mood and post positive mood induction mood ratings differed for the SAM ($t = 3.60$, $p < .001$) and the PAS ($t = 1.92$, $p < .05$), with higher positive mood ratings occurring in the positive mood induction group. Mood ratings did not differ for the ELA ($t = 1.33$, $p = ns$). These means are presented in Table 8.1. Additionally, positive urgency was uncorrelated with these three mood scales pre-mood induction, was uncorrelated with reported changes in mood pre- to post-neutral and pre- to post-positive mood induction, and was uncorrelated with the amount of alcohol consumed post-neutral mood induction.

Effect of Positive Mood Induction on Alcohol Consumption as Predicted by Personality

I next conducted a multiple regression analysis to examine the effect of the positive mood induction on alcohol consumption as a function of reported tendencies toward rash action (Table 8.2). I used the difference between the amount of beer consumed (measured in ml) in the positive mood condition and the amount of beer consumed in the neutral mood condition as the dependent variable for this analysis. I included as the independent variables the four UPPS-R traits and positive urgency in the same step of the regression analysis to control for the overlap positive urgency may have with these other rash action traits. Positive urgency was the only significant predictor ($\beta = 0.42$, $p < .05$).

Table 8.1

Mean levels of self-reported mood ratings pre and post positive and neutral mood inductions for study two

	Pre-induction mean (SD)	Post induction mean (SD)
SAM[a]		
Neutral mood condition	2.87 (0.76)	2.78 (0.66)
Positive mood condition	3.13 (1.38)	2.40 (1.10)
PANAS POS[b]		
Neutral mood condition	1.83 (0.43)	1.79 (0.42)
Positive mood condition	1.74 (0.43)	1.86 (0.42)
PANAS ELA[b]		
Neutral mood condition	2.45 (0.68)	2.42 (0.69)
Positive mood condition	2.36 (0.60)	2.36 (0.65)

Note. [a] higher scores indicate less positive mood reported; [b] higher scores indicate more positive mood reported

Table 8.2

Multiple regressions of beer consumption on impulsivity traits

	B	SE B	β	Total R^2
Dependent variable: Difference in beer consumption (Trial 2 – Trial 1)				0.24
LP	229.20	181.31	0.29	
NUR	-359.05	162.40	-0.52	
SS	40.36	112.30	0.06	
LPS	-186.49	160.10	-0.22	
PUR	278.75*	151.48	0.42	

Note. PUR = positive urgency, NUR = negative urgency, LP = lack of premeditation, LPS = Lack of perseverance, and SS = sensation seeking.

Note. ** $p < .001$, * $p < .05$

Chapter Nine

Study Two Discussion

The findings of study two provide further support for my claim that positive urgency plays a role in risky behavior involvement. First, the findings replicate the study one findings that positive urgency was unrelated to reported mood pre-mood induction and that it was uncorrelated to reported changes in mood ratings pre to post mood induction. Additionally, it appears that the mood induction procedure was successful. Participants' moods did not change following a neutral mood induction; however, on at least two of three measures, they reported being in a significantly more positive mood following positive mood induction. Also, positive urgency was unrelated to consumption of alcohol in the neutral mood induction. Finally, when individuals were placed in a positive mood, positive urgency levels predicted consumption of significantly more alcohol than when in a neutral mood. None of the other four dispositions to rash action predicted increased consumption while in a positive mood state.

These findings extend the results of study one: In both studies, hypotheses were confirmed based on direct observation of risky behaviors. Thus, study two further increases confidence in the claim that positive urgency predicts increased risky behavior involvement while in a positive mood.

Chapter Ten

General Discussion

Positive urgency has been shown in past research to be related to a wide range of risky behaviors both cross-sectionally and longitudinally. As encouraging as those findings have been, they have been based exclusively on self-reports of prior engagement in risky or problematic behaviors. Thus, to provide further support for the claimed contribution of positive urgency to maladaptive acts, it was important to investigate the trait using direct observation of risky behavior involvement under tight laboratory controls. Studies one and two are the first to do so, and the results of both studies supported positive urgency's claimed role. Thus, I found further validation for the role of positive urgency in two specific risky behaviors: gambling and alcohol consumption.

In a laboratory gambling task, positive urgency predicted a negative outcome from that task: It predicted an increased likelihood of exploding virtual balloons and thereby losing the money one could have earned on the balloon. Interestingly, positive urgency was not related to overall higher levels of involvement in the task: It did not predict more balloon presses, i.e., more gambling attempts.

This pattern of findings might be understood as follows. One could make the decision to engage in multiple gambling attempts, i.e., many balloon presses, and choose to mitigate one's risk by limiting the number of presses one makes on any one balloon (since each balloon will eventually explode, causing money loss). This approach might constitute a rational gambling strategy that is perhaps not overly influenced by one's mood. Since strong emotions can bias decision making in non-rational directions (Bechara, 2004, 2005; Dolan, 2007; Dreisbach, 2006; Shiv, et al., 2005), the positive

mood induction could have been associated with an increased risk for a non-rational approach among individuals high in positive urgency. Although positive urgency did not predict a significant increase in balloon presses per unexploded balloons between the neutral and positive mood states, it did predict a negative outcome of persistent balloon pumps: exploding more balloons. Thus, the theoretical claim that positive urgency reflects a disposition to engage in rash actions when in an extreme positive mood was supported. In fact, positive urgency, with this reasoning, predicted such increase in pumps following positive mood induction, that individuals popped a significantly higher number of balloons. However, it is important to consider reasons high positive urgency might not predict increased pumps per unexploded balloons. One possibility is that positive urgency does not predict increased rash action following positive mood induction; much data dispute this possibility. Additionally, it could be that positive urgency does not predict increased gambling persistence; although this is possible, the fact that no other impulsivity trait correlated with increased pumping means that this possibility should be replicated in the future. A third option is that this is a non-replicable finding. The final, and perhaps most plausible possibility is that since the number of exploded balloons increased, there might have been less variance in the average number of pumps per unexploded balloons and therefore, quite possibly, a restriction of range in this variable post positive mood induction, making prediction difficult.

Concerning drinking behavior, one cannot, of course, study problem drinking in the laboratory. One can, however, study amount of alcohol consumed during a sitting. My demonstration that positive urgency predicted increased alcohol consumption while in a positive mood (a) confirms similar findings obtained via self-report and (b) suggests

positive urgency is positively related to an increased likelihood of risky drinking. It is likely that the relationship between positive urgency and drinking problems, which has been shown in previous studies (Cyders et al., 2007a; Cyders et al., 2007b; Cyders & Smith, 2007), is mediated by the amount of alcohol consumed. This possibility should be tested empirically.

In cross-sectional and correlational self-report research, including that conducted as part of study one, positive urgency does not relate to the frequency of engaging in risky behaviors, once the contribution of sensation seeking is accounted for. I did not study frequency of involvement in the two laboratory tasks used in these studies, but the frequency finding is not inconsistent with demonstrations of positive urgency's role in relation to problem outcomes. Perhaps one can engage in risky, or thrilling, or stimulating activities in a rational, measured way that mitigates one's risk for negative outcomes. Individual differences in sensation seeking appear to reflect this tendency to do so better than do individual differences in positive urgency.

The current study has weaknesses, which should be noted here. First, although the laboratory setting provides stringent controls on the environment and facilitates the direct observation of behavior, what the laboratory also offers is behavior in a less ecologically valid context, which may work against observation of target phenomena. For instance, it is quite possible that positive urgency functions most strongly within a social context, and not when individuals are alone. The laboratory, therefore, might not be the ideal place to study such a phenomenon. Further research should be done to examine the role of positive urgency in real-life scenarios and within social contexts, using ecological momentary assessment, for instance. Secondly, the current study was generally effective

in increasing mood with the positive mood induction procedures chosen; however, research has shown that positive moods are extremely difficult to induce in laboratory settings. It is unlikely that we induced the extreme positive emotions described in urgency theory. There is, therefore, a need to develop new methods of positive mood induction that could induce the extreme emotional responses in which positive urgency is thought to be most predictive. Third, the current study, and much of the previous research with positive urgency, utilized a mostly Caucasian college student sample, which may limit the generalizability of the findings to other groups of individuals. However, the use of college students is also a prime sample of interest for positive urgency research. College students are in a developmental period characterized by impulsive action (see Del Boca et al., 2004; Budde & Testa, 2005; Hingson et al., 2005; Kelley et al., 2004; Wechsler et al., 1995) that may involve a high level of positive urgency, thus facilitating observation of these phenomena. Finally, study two suffers from a small sample size, with limited power to show relationships; however, despite this low power, positive urgency was still able to emerge as a predictor in the experimental analysis.

In conclusion, cross-sectional, prospective, and experimental research with positive urgency seem to converge to support its role for gambling behaviors and alcohol consumption. In all, the research seems to suggest that positive urgency is important for problematic levels of and negative outcomes related to gambling behaviors and alcohol consumption (Cyders et al., 2007a; Cyders et al., 2007b; Cyders & Smith, in press-a, 2007, in press-b) and has suggested a role for other risky behaviors as well (Zapolski et al., 2007). The cross-sectional data presented here generally replicate past research. The

experimental data add credence to the role of trait urgency in the participation in risky behaviors.

Although it is of course difficult to demonstrate a causal role for a personality trait that, by definition, cannot be manipulated, the combination of demonstrating that (a) the trait predicts subsequent increases in risky behaviors, over and above stringent statistical controls and (b) experimental induction of positive mood leads to increased risky behavior only for those high in the trait suggests the plausibility of a causal role for positive urgency. Because this study was the first to show support for this relationship through an experimental manipulation of mood, it plays an important role in the validation of positive urgency theory. An important future step may involve ecological behavioral sampling to validate the role of positive urgency in problematic risky behavior in real-life settings. Finally, studies which can establish a longitudinal pathway from positive urgency to the initiation of risk-taking behaviors are important as well.

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GRANTS AND FELLOWSHIPS

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- **Provost's Undergraduate Research Fund Award**, Reliability and Validity of an MMPI-2 Bulimia Scale in a Nonclinical Population, 2002 – 2003, $2,000

AWARDS

- **Predoctoral Research Award**, Awarded to one student yearly for outstanding predoctoral research publication, University of Kentucky, Department of Psychology, 2007

- **Honorable Mention**, Hager Research Award, Spring Academic Conference, Kentucky Psychological Association, 2007

- **Excellent Clinical Performance Award,** Awarded to students with excellent service to the Harris Psychological Services Center, University of Kentucky, Department of Psychology, 2007

PROFESSIONAL POSITIONS

- **Invited Reviewer**, *Psychological Assessment*, 2007 - present

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- **Campus Representative**, American Psychological Association of Graduate Students, University of Kentucky, 2004 – 2006

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PROFESSIONAL AFFILIATIONS

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RESEARCH PUBLICATIONS

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Zapolski, T. B. C., **Cyders, M. A**., Rainer, S., & Smith, G. T. (2007, August). Examination of the relationship between positive urgency, drug use, and

risky sex. Paper presented at the annual meeting of the American Psychological Association, San Francisco, CA.

Cyders, M. A., & Smith, G. T. (2007, July). Risky behavior while in a positive mood: New findings on the role of positive urgency to predict maladaptive alcohol use. Paper presented at the annual meeting of the Research Society on Alcoholism, Chicago, IL.

Cyders, M. A. (2007, March). Positive urgency as a risk factor for maladaptive and impulsive action: A summary of findings. Paper presented at the spring academic conference of the Kentucky Psychological Association, Lexington, KY.

Cyders, M. A., Spillane, N. S., Smith, G. T., & Rainer, S. (2006, November). Longitudinal prediction of mood-based impulsive behavior during the first year of college: integrating impulsivity and emotion to predict risk. Paper presented at the annual meeting of the Association for Behavioral and Cognitive Therapy, Chicago, IL.

Cyders, M. A., Smith, G. T., Spillane, N. S., Fischer, S., Annus, A. M. (2005, June). Development and validation of a measure of positive urgency and its relation to drinking behaviors. Paper presented at the annual meeting of the Research Society on Alcoholism, Santa Barbara, CA.

Fischer, S., Smith, G. T., **Cyders, M. A**., Spillane, N. S., Annus, A. M., & Hendricks, M. (2005, June). Integrating dispositional and learning risk factors for addictive behaviors. Paper presented at the annual meeting of the Research Society on Alcoholism, Santa Barbara, CA.

Fischer, S., Smith, G. T., & **Cyders, M. A**. (2004, November). Impulsivity: Construct validation of four types and implications for comorbidity of gambling, drinking, and binge eating. Paper presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.

Fischer, S., Smith, G. T., & **Cyders, M**. (2004, June). Sensation seeking versus urgency as risk factors for drinking and gambling. Paper presented at the annual meeting of the Research Society on Alcoholism, Vancouver.

Cyders, M. A. (2003, May). Validity and Reliability of a new MMPI-2 subscale, the BUL scale, in a nonclinical population. Paper presented at the Ohio University Student Research and Creativity Fair, Athens, OH.

RELATED WORK EXPERIENCE

- **Behavioral Medicine Resident**, Chandler Medical Center, Orofacial Pain Clinic, University of Kentucky, 2007 – 2008

- **Individual Therapist**, Jesse G. Harris Psychological Services Center, University of Kentucky, 2004 – 2008

- **Examiner**, Allen Psychological Associates, Lexington, KY, 2006 – 2007

- **Instructor**, Psychology 313 Personality and Individual Differences, Department of Psychology, University of Kentucky, 2006

- **Guest Lecturer**, Ethics, Psychological Assessment, Interpersonal Process Therapy, and Dialectical Behavior Therapy and Borderline Personality Disorder, Psychology 399 Field Based Clinical Experience, Department of Psychology, University of Kentucky, 2006

- **Skills Group Leader for Dialectical Behavior Therapy**, Jesse G. Harris Psychological Services Center, University of Kentucky, 2005 – 2006

- **Meditation Group Guest Leader**, Meditation-based Stress Reduction Treatment for Individual with Substance Abuse Disorders, Lexington Court House, 2006

- **Examiner**, Wechsler Adult Intelligence Scale and Wechsler Memory Scale Tryout, Harcourt Inc., 2006

- **Examiner**, Differential Abilities Scale Restandardization, Harcourt Inc., 2005 – 2006

- **Clinic Assistant Coordinator**, Jesse G. Harris Psychological Services Center, University of Kentucky, 2005 – 2006

- **Instructor,** Psychology 100, Introduction to Psychology, Department of Psychology, University of Kentucky, 2005

- **Teaching Assistant**, Psychology 630, Clinical Assessment I: Intellectual Assessment, Department of Psychology, University of Kentucky, 2005

- **Individual Therapist**, Counseling and Testing Center, University of Kentucky, 2004 – 2005

- **Teaching Assistant and Lab Instructor**, Psychology 611 Psychometrics: Multiple Regression Techniques, 2005

- **Interpersonal Process Group Therapist**, Counseling and Testing Center, University of Kentucky, 2004 – 2005

- **Children's Social Skills Group Therapist**, Jesse G. Harris Psychological Services Center, University of Kentucky, 2005

- **Academic Advisor** – Graduate Assistant, Academic Advising Center, University of Kentucky, 2004 – 2005

- **Examiner**, Jesse G. Harris Psychological Services Center, University of Kentucky, 2004 – present

- **Treatment Aide**, Bassett House Residential Treatment Facility of Adolescents, Athens, OH, 2001