2008

The Influence of Positive and Negative Affect on the Processing of Outcome Expectancies Related to Risky Sexual Practices

Elizabeth Anne Pomery
Iowa State University

The influence of positive and negative affect on the processing of outcome expectancies related to risky sexual practices

By

Elizabeth Anne Pomery

A dissertation submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Psychology

Program of Study Committee:
Frederick X. Gibbons, Co-major Professor
Meg Gerrard, Co-major Professor
Frederick O. Lorenz
Gary L.Wells
Gregory J.Welk

Iowa State University

Ames, Iowa

2008

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The current study is a continuation on a line of research examining the effects of affective states on cognitions related to risky sexual behavior and is based on the Prototype/Willingness Model (Gibbons, Gerrard, & Lane, 2003). Past research (Pomery, 2004) found that mood states had a greater influence on behavioral willingness (BW) to engage in risky sexual behavior than on behavioral intentions/expectations (BI/BE) to engage in risky sexual behavior. Negative affective states were associated with greater levels of willingness and positive affective states were associated with lower levels of willingness. The current study investigated the effects of happy, sad, and neutral mood states on positive and negative outcome expectancies and other risk cognitions (willingness, intentions/expectations, prototype images, perceived vulnerability). College students (N = 110), who were pre-selected based on their prior high levels of willingness and either low or high levels of intentions, were randomly assigned to one of the three mood conditions (happy, sad, neutral). After the mood induction, participants were exposed to eight positive and eight negative outcome expectancies and their endorsements of these expectancies were measured, along with their response times. This was followed by the other risk cognition measures. It was hypothesized that those in the negative mood condition would more strongly endorse the positive outcome expectancies, as they would be motivated to improve their current mood state. In contrast, participants in the happy mood condition were expected to have lower levels of endorsement for the positive outcome expectancies. In addition, it was hypothesized that the effects of the induced mood states would be moderated by prior level of BW and BI, with those "at risk" (high BW/low BI) showing stronger mood effects

than those more committed to the risky behavior (high BW/high BI). Contrary to expectations, no effects of mood were found on the endorsement of outcome expectancies in any of the repeated-measures analyses. When examining only the negative outcome expectancies, there were significant effects of mood on the "Would this be important to you?" item, though not as predicted. The negative outcome expectancies received the highest importance ratings from those who were in the happy mood condition and were higher in mass-testing BI/BE. There were few effects of mood on the positive outcome expectancy items. Not surprisingly, those in the high BW/high BI group (the "intenders") showed greater endorsement of the positive outcome expectancies and lower endorsement of the negative outcome expectancies; these effects may be due to dissonance reduction. Contrary to predictions, however, when interactions were found, it was the high BW/high BI group that showed the stronger mood effects ("the intenders"). With respect to the response time measures, those in the happy mood condition with higher levels of prior BI/BE were quicker at reading the negative outcome expectancies; those in the sad condition took longer to report whether these expectancies either came to mind or were important to them. Those in the sad mood condition reported the highest levels of BW and BI/BE during the experimental session.

INTRODUCTION

The average layperson is aware that emotions can influence their everyday judgment and decision-making (Wang, 2006), as exemplified in the phrase, "I'm too emotional to think straight." However, the exact ways in which different affective states influence cognitions and behavior are more varied and complex (Pham, 2007) than the simplistic statement indicates. Likewise, the relation between mood and risk behavior has also failed to present a clear or consistent picture. On the one hand, one can speculate that positive moods should lead to increases in risky behaviors, as happy people tend to be more optimistic (Salovey, Detweiler, Steward, & Bedell, 2001), think less carefully about decisions (Mackie & Worth, 1991), and are more likely to engage in approach behaviors (Eich & Forgas, 2003). On the other hand, it's also possible that negative moods lead to more risky behaviors, as unhappy people tend to be willing to engage in potentially risky behavior to ameliorate their current affective state (Baumeister & Scher, 1988). The goal of the current study is to investigate the role of affect, both positive and negative, on health risk cognitions. First, the literature on affect and information-processing will be reviewed. Second, specific studies regarding affect and risk decision-making will be discussed. Then the research will be applied to elements of the Prototype/Willingness model, a model of health risk behavior.

Affect & Information-Processing

Numerous studies have examined the effects of mood on cognition in recent years. A large body of research has emerged showing that positive (i.e., happy) mood states are related to shallow information processing, whereas negative moods (e.g., sadness) are related to more in-depth processing (see Martin & Clore, 2001). (One exception appears to be *intense* negative and positive mood states, which have been shown to disrupt information-

processing; Pham, 2007). Thus, it is not surprising that mild to moderately happy moods are associated with the use of heuristics in judgment and decision-making. For example, when presented with a persuasive message, happy participants are not influenced by the strength of the arguments in the message, but instead tend to focus on peripheral cues (e.g., the total number of arguments). Positive moods are likewise associated with other types of top-down processing strategies (Gasper, 2003). Negative moods, on the other hand, are associated with more analytic, detail-oriented, bottom-up processing strategies (Gasper, 2003). When presented with a persuasive message, sad participants are influenced by the strength of the arguments (i.e., participants are more influenced by strong than weak arguments; Mackie & Worth, 1991). This effect of mood on information-processing is quite robust.

Informational approach. Three main approaches have been taken explaining the influence of mood on information-processing: informational, capacity, and motivational. According to the informational approach, one's current mood state is used as information in determining the safety of one's environment. This approach is derived from the feelings-as-information model developed by Schwartz and Clore (1983). Happy participants interpret their mood state as an indicator that their environment is safe, and as a result, it is acceptable to take cognitive shortcuts and be more cognitively flexible. The affective state of people who are sad, however, informs them that something in their environment is amiss, and leads to careful (i.e., more in-depth) processing of information. There are several theories that use an informational approach. For example, the mood-as-general knowledge model suggests that people in positive affective states are more likely to rely on general knowledge structures, whereas those in negative states are more likely to rely on the data at hand (Bless, 2001). The general knowledge structures allow for more parsimonious processing. Another

similar model is the mood-as-input model (Martin, Ward, Achee, & Wyer, 1993), which assumes that the effects of moods are context dependent.

Limited capacity approach. The second approach to explaining the influence of mood on processing suggests that happy moods are associated with less processing, because happy moods involve more cognitive capacity (i.e., "take up more cognitive space"). Thus, when participants are given a task that increases cognitive load while processing a message, one would expect negative mood participants to perform the same as their happier counterparts. Mackie and Worth (1991) provided support for this cognitive load approach by demonstrating that when positive mood is induced, participants processed persuasive messages less carefully than those in neutral moods, even when motivation for processing the message was high. However, others have posited that negative moods, not positive moods, are more likely to increase cognitive load (Dalgliesh, 2003; Schwartz, Bless, & Bohner, 1991).

Motivational approach. The third approach, the motivational approach, suggests that people in positive moods are motivated to maintain their current mood state, whereas those in negative moods are motivated to improve their mood. This approach, also known as mood maintenance or mood management, is captured in two lines of research. The first of these, hedonic contingency (HC), suggests that people who are in a positive mood carefully consider hedonic consequences before making a decision because they are motivated to act (and think) in ways that will not jeopardize their current (positive) mood (Wegener & Petty, 1994; Wegener, Petty, & Smith, 1995). The second, the Negative State Relief (NSR) model states that people in negative moods are motivated to ameliorate their current mood, as there is a general drive to alleviate aversive states (Cialdini, Darby, & Vincent, 1973). In two

studies, Handley and Lassiter (2002) found support for both the HC hypothesis and the NSR model**.** When participants were told about the affective content of the message beforehand, both happy and sad participants processed the uplifting messages more carefully than the depressing messages. Happy participants also processed uplifting messages more in-depth when they were not given affective expectancies. However, participants in a sad mood processed both uplifting *and* depressing messages at an equally high level if there were no affective expectations.

Studies on emotional distress and self-regulation have lent support to the motivational approach. In a series of studies, Tice, Bratslavsky, and Baumeister (2001) found that those in emotional distress (i.e., negative mood states), were strategically motivated to engage in risky acts that would lead to mood repair. In other words, for those in bad moods, the short-term affective gains took precedence over their long-term self-regulation goals. The researchers could eliminate the effect of emotional distress on impulsive behavior by informing the participants that their moods were "temporarily frozen." Thus, people only acted impulsively when they were in a negative mood *and* believed that their mood could be altered. Overall, the studies' findings are consistent with the motivational approach, and contradict the other approaches.

Other effects on information-processing. In addition to the type of processing (bottom-up vs. top-down), affect can also influence other cognitive processes, such as attention and memory (Dalgliesh, 2003). For example, people are more likely to attend to like-valenced information (Bower, 1981). Therefore, people in happy moods are more likely to attend to positively-valenced information, whereas sad moods lead people to pay more attention to negatively-valenced information. Likewise, it is easier to recall like-valenced

information from memory (Eich & Forgas, 2003). Similarly, incidental emotional states (i.e., emotions unrelated to the object of judgment or decision) have been shown to influence people's beliefs and perceptions in an assimilative (mood-congruent) fashion (Pham, 2007); for example, those watching a happy television program are more likely to rate a commercial more positively than those who viewed it during a sad program (Goldberg & Gorn, 1987). This assimilation is strongest when the target of one's judgments is relatively ambiguous. Affect has also been shown to influence peripheral aspects of one's self-concept (Eich & Forgas, 2003). This effect is stronger for people who have low self-esteem, experience strong affect intensity, and have a high need for approval. Happy and sad moods also appear to simplify the structure of one's self-concept as well as concepts of known others (i.e., these concepts organize around a single dimension rather than multiple dimensions; DeSteno & Salovey, 1997).

Affect & Risky Decision-Making

According to Loewenstein and colleagues (Loewenstein, Weber, Hsee, & Welch, 2001), affect can influence decision-making in two separate ways: through cognitive and emotional reactions to the (risky) decision. First, one's *anticipated* emotions to the potential outcomes of the risk scenario (e.g., regret) can influence one's cognitive reaction to the decision. Second, one's emotional reactions to the risk decision (i.e., *anticipatory* emotions) can also influence the decision-making process. Anticipated and anticipatory emotions both play a role in Loewenstein's risk-as-feelings model (Loewenstein et al., 2001). According to the model, one's *anticipated* emotions are considered one of the potential consequences of the action, and along with the subjective probabilities associated with the potential outcomes, influence both cognitive evaluation and feelings regarding the risky decision. People's

emotional reactions to the thought of the risk (i.e., *anticipatory* emotions) depend on a number of factors, such as the vividness of the imagined consequences or one's personal experience with the behavior. According to the model, anticipatory emotions and cognitive evaluations (including anticipated emotions) influence each other, and both influence behavior. Thus, the model suggests that cognitive evaluations can indirectly influence behavior through one's feelings.

Another explanation for the influence of affect on decision-making is that people use an affect heuristic when making judgments. This explanation proposes that mental representations of objects and events are "tagged" with varying degrees of affect (Slovic, Finucaine, Peters, & McGregor, 2002). These tags, in turn, act as cues when judgments are made later. The more precise the affective tag, the larger the impact that the affect has on the decision. The affective tag is dependent on the context of the situation. Therefore, certain affective tags may be activated in risk-conducive environs.

Affect & Risk Behavior/Cognitions

Positive affect. Previous research has looked at the relation between affective states, risky decision-making, and risky behavior. For example, Isen and colleagues have conducted a series of experiments examining the effects of happy mood states on risky betting behavior (Arkes, Herren, & Isen, 1988; Isen & Geva, 1987; Isen, Nygren, & Ashby, 1988; Isen & Patrick, 1983; Nygren, Isen, Taylor, & Dulin, 1996). This line of research has shown that happy participants tend to be "cautiously optimistic" (Nygren et al., 1996) compared to participants in a neutral mood. Participants in a happy mood (induced by receiving a small gift) are more cautious than neutral mood participants when the risk is "real" or the potential loss is large (Arkes et al., 1988; Isen & Geva, 1987; Nygren et al., 1996). When the risk is

purely hypothetical and the potential loss is small, happy participants tend to be more willing to place risky bets than neutral mood participants (Arkes et al., 1988; Isen & Geva, 1987; Nygren et al,, 1996). Isen and her colleagues have also demonstrated that when the bet is "high-risk," participants in a happy mood are more likely to think about the consequences of losing than are those in a neutral mood (Isen & Geva, 1987). When the potential loss is small or inconsequential, the amount of contemplation about losses does not differ between positive and neutral mood conditions. Isen and her colleagues have also shown that people in happy moods view losses as being more unpleasant and therefore more threatening (Isen et al., 1988); however, there is no difference in how happy participants perceive potential gains. Isen and colleagues have not studied negative moods, or examined risk behaviors other than lottery betting tasks.

Negative affect. While Isen's line of research suggests that positive moods are related to risk aversion, other researchers have found support for the idea that negative mood is related to risk-taking. In a series of six studies, Leith and Baumeister (1996) found that negative mood states (e.g., embarrassment, anger, sadness) were related to increased preferences for high-risk, high-payoff options as compared to neutral or "good" mood states. This effect, however, was only found when the subjectively unpleasant state was paired with high arousal. These findings suggest that negative, high-arousal affective states are associated with decreased self-regulation of behavior. On a related note, it has been found that negative affective states, specifically anxiety, fear, anger, and embarrassment, are associated with self-destructive (i.e., risky) behaviors (Baumeister & Scher, 1988). Hockey and colleagues, however, found that state and trait depression and anxiety were not consistently related to either risk behavior or risk cognitions (Hockey, Maule, Clough, &

Bdzola, 2000). Instead, they found that state fatigue was related to increased risk-taking. More recent research has investigated the role of affect in performance on the Iowa Gambling Task (IGT; Bechara, Damasio, Damasio, & Anderson, 1994). Suhr and Tsanadis (2007) found that negative affect predicted riskier performance on the task; however, affect was not manipulated in the study.

Additional findings. In studies that have both positive and negative affect conditions (usually happy and sad), it is generally found that negative mood participants are more risky than those in positive moods (Chuang & Chang, 2007; Mittal & Ross, 1998). Happy participants are more likely to interpret an ambiguous business scenario in a favorable manner (i.e., view it as an opportunity); however, participants in a negative mood are more likely to be willing to take a risk (Mittal & Ross, 1998). This study also found that negative mood participants were more likely to be influenced by how the scenario was framed. They interpreted their results as showing that either negative mood participants were processing the information more carefully or that positive mood participants were overriding the threat frames and viewing all the scenarios more favorably. These results support the general findings of affect and information processing research discussed earlier, and the idea that negative mood states are related to risky behaviors.

Many studies have focused on the relation between state affect and risk-taking. In a study of *trait* affect and decision-making, Williams and colleagues (Williams, Zainuba, & Jackson, 2003) looked at the relation between risk decision-making, and positive (PA) and negative affect (NA). Neither PA nor NA were related to increased risk-taking. At least for some risk perceptions, high PA participants tended to be more optimistic, and high NA participants more pessimistic, than participants low on these traits. Risk intention (actually

measured as an expectation) was not related to either PA or NA. However, high PA participants did not assess potential gains or losses more negatively, suggesting that losses "did not loom larger" as Isen posits.

In general, recent research supports the idea that happy participants are more risk-averse and sad participants are more risk-taking. Other research, however, has divergent findings. For example, Chou, Lee, and Ho (2007) induced participants into sad, neutral, and happy moods and found that risk-taking on a version of the choice dilemmas questionnaire was associated with positive, not negative, mood states. It's also been found that there is no relation between affect and risk-taking (Clark, Iverson, & Goodwin, 2001) or that sad people are more risk-averse (Yuen & Lee, 2003). In the study by Yuen and Lee (2003), participants' risk tendencies were measured using scenarios, and it is unclear how "real" these scenarios were to the participants. Therefore, the findings may be analogous to those reported by Isen and colleagues in the happy mood/minimal risk conditions (e.g., Isen & Geva, 1987, i.e., when stakes were high in a betting task, happy participants were more risk-averse than neutral mood participants, whereas when stakes were low, happy participants were more risk-taking). The effect of affect on risk-taking is likely quite complex, and it is not surprising that researchers have found differing results, as they have studied different behaviors, and used different methodologies and measures in their designs (as discussed later).

Classic research on risk perception has demonstrated that participants in negative moods estimate the frequency of undesirable events (e.g., diseases, life problems) to be significantly higher than those in neutral moods, whereas those in positive moods estimate significantly lower frequencies than those in neutral moods (Johnson & Tversky, 1983). This

research would also suggest that people in positive moods are more likely to engage in risky behaviors compared to those in negative moods.

Affect and Health Behavior

The association between negative affect and substance use has been well-studied, as researchers have posited that alcohol and other substances are often used as a coping mechanism to deal with aversive emotional states (e.g., Measelle, Stice, & Springer, 2006). This form of emotion regulation has been used to explain the relation between negative affect and other forms of health risk behaviors. For example, Cooper and colleagues identified six motives for engaging in sex (Cooper, Shapiro, & Powers, 1998). Two of the motives have links to affect regulation: enhancement motives (e.g., having sex for the enjoyment and pleasure) and coping motives (e.g., having sex to relieve stress). In general, males were more likely to endorse these motives, which were related to greater risk-taking. Coping motives were related to more promiscuous sex (both cross-sectionally and over time); however, coping motives were not related to failure to use condoms. Cooper and colleagues have also noted similar motives for drinking behaviors (Cooper, Frone, Russell, & Mudar, 1995). In a model of risky behaviors, Cooper, Agocha, and Sheldon (2000) posit that risky behaviors are predicted by enhancement and coping motives. The former motives are driven by extraversion, whereas the latter are related to neuroticism. Whereas drinking motives tend to depend on the situation (Cooper et al., 1995), motives to engage in sex tend to be more trait-like (Cooper et al., 1998). Others have found that people who endorse these types of coping motives are more likely to engage in substance use and encounter more severe addiction-related consequences (e.g., Hussong et al., 2007; Shiffman et al., 2007; Verdejo-Garcia et al., 2007).

Risky sexual behavior. Recent studies on affect and sexual behaviors have shown a relatively clear relation between negative or aversive states and risky sexual practices (Auerbach, Abela, & Ho, 2007; Brown et al., 2006; Paxton, Valois, Watckins, Huebner, & Drane, 2007; Sterk, Theall, & Ellison, 2006). However, an earlier meta-analysis failed to find a significant relationship (Cropaz & Marks, 2001). Cropaz and Marks (2001) conducted a meta-analysis of 34 studies, to examine the relation between negative affect and sexual risk-taking behavior, and concluded that there was no significant relation. They note that effect sizes tend to be greater when composite sexual risk measures are used, as opposed to single risk behavior measures, and suggest that previous studies may have lacked the power to detect significant effects. They also note that virtually no studies have investigated a possible curvilinear relationship between negative affect and risk-taking. It is unclear why the meta-analysis failed to find a significant relation between negative affect and sexual risk-taking; it appears that the more recent studies, conducted since the meta-analysis, have been more consistently finding an effect (e.g., Auerbach et al., 2007; Brown et al., 2006; Paxton et al., 2007; Sterk et al., 2006).

Intentions. A couple of studies have investigated the influence of affect on intentions to engage in risky health behaviors. Armitage and colleagues (Armitage, Conner, & Norman, 1999) examined how positive and negative affect influence the elements of the theory of planned behavior with respect to condom use and eating behavior. For both behaviors, it was found that participants in a negative mood were more likely to base their behavioral intentions on their attitudes toward engaging in the healthful behavior (i.e., using a condom, eating healthily), suggesting that they were more problem-focused and detail-oriented. Attitudes are one of the prmary predictors of intentions in expectancy-value theories, thus it

was concluded that those in a negative affective state were thinking in a more systematic manner. Participants in positive mood states, however, based their intentions on subjective norms or self-identity, a less reliable source. The authors concluded that, as previous research has found, negative moods were associated with more systematic processing and positive moods with more heuristic processing; thus, they predicted that positive moods should be associated with increased risky behaviors. Another study on affect and intentions to engage in risky sexual behavior, however, found a different pattern. MacDonald and Martineau (2002) found that participants in negative moods were more likely to report intentions (actually behavioral expectations)[1] to engage in risky sexual behavior. Participants in the negative mood condition reported a higher proportion of positive thoughts regarding having unprotected sex, than did those in the positive mood condition. These findings suggest that those in negative moods are most at risk because of their intentions to engage in risky health behavior.

Perceived vulnerability. Research has demonstrated that people in positive mood states tend to be more optimistic (i.e., perceive themselves as being less at risk to potential negative outcomes) than those in neutral or negative mood states, whereas the latter tend to be more realistic about their personal risk (Salovey et al., 2001). People in positive moods also tend to perceive higher levels of self-efficacy and outcome-efficacy compared to those in negative moods. For example, Salovey and Birnbaum (1989) found that happy participants experiencing cold or flu symptoms, were more confident in their ability to perform health-promoting (and illness-alleviating) behaviors. Happy people perceive they have more control over the situation and are better able to control their behavior in a way that minimizes risk (Salovey et al., 2001). However, other studies have failed to find evidence for the depressive

realism effect (Pham, 2007), and it is suggested that the phenomenon may not generalize to more meaningful and consequential tasks (Pacini, Muir, & Epstein, 1998).

Shortcomings of Previous Research

Many of the inconsistencies in the literature on affect and risk-taking, can be linked to the various ways constructs have been operationalized (Ethier et al., 2006; Walch & Rudolph, 2006). For example, negative affect may be a broad measure that includes depressive symptoms, anxiety, and worry (Pardini, Lochman, & Wells, 2004); alternatively, some studies have focused on specific emotions (e.g., Paxton et al., 2007). Similarly, affect has been measured at both the trait and state levels. In addition, the definition of risk-taking varies from study to study. In some cases, a more aggregate measure of risk is used, rather than a more specific measure (Ethier et al., 2006; Walch & Rudolph, 2006).

It is unclear the extent to which previous research on affect and decision-making in betting or gambling scenarios (e.g., Clark et al., 2001) generalizes to decisions regarding real-world health decisions. Also some studies have focused on the effects of either positive affect (e.g., Arkes et al., 1988; Isen & Geva, 1987; Isen et al., 1988; Isen & Patrick, 1983; Nygren et al., 1996) or negative affect (e.g., Leith & Baumeister, 1996), rather than both. Other studies are limited by the fact that a correlational design was used (e.g., Suhr & Tsanadis, 2007), and causal statements about the influence of mood states cannot be made.

Negative moods, particularly sad moods, can be difficult to induce in participants (Mackie & Worth, 1991). Researchers using film clips or stories often use scenarios that involve death or dying (e.g., show a clip from "The Champ" where the father dies). Though these scenarios are often more effective than other mood induction techniques (Westermann, Spies, Stahl, & Hesse, 1996), it is likely that these scenarios make death (mortality) more

salient to the participants, and studies of terror management theory suggest that participants, at least males, who have had mortality made salient are more likely to engage in risky behavior (Hirschberger, Florian, Mikulincer, Goldenberg, & Pyszczynski, 2002).

In sum, research in this area has been troubled by differences in how constructs are defined and measured, concerns regarding external validity, and issues regarding induction of negative affective states. These issues have likely contributed to the diverse nature of the findings. As discussed in more detail later, the current study addressed these issues.

Prototype/Willingness Model

Risk cognitions are the focus of the Prototype/Willingness (prototype) model used in the current study (Gibbons & Gerrard, 1995, 1997; Gibbons, Gerrard, & Lane, 2003). A central construct in the model is behavioral willingness (BW), defined as an openness to risk opportunity—what one is willing to do when placed in a risk-conducive environment. According to the model, both BW and behavioral intentions (BI) predict risky behavior; however, there are two important differences between the two constructs. First, BW involves less pre-contemplation of both the behavior and its potential outcomes (Gibbons et al., 2003; Gibbons, Gerrard, Ouellette, & Burzette, 1998). In contrast, BI is more planful and involves thinking about both the behavior and its consequences. Second, there is less internal attribution of responsibility with BW as compared to BI (Gibbons et al., 2003).

Willingness. According to the model, willingness to engage in a risky behavior usually develops before intentions; thus, BW is a better predictor in adolescents and young adults than is intention (Pomery, Gibbons, Reis-Bergan, & Gerrard, 2008). It is often the case that young people have no intention or expectation of engaging in a risky behavior, but may have some degree of willingness to engage when in certain situations. These individuals

(low BI/high BW) are considered especially at-risk, as they are less likely to plan ahead (e.g., carry a condom, have a designated driver; Gibbons et al., 2006). Other young people have clear plans to engage in risky behavior (high BI), and their willingness is typically in-line with this goal state (high BW).

Prototype images. Another key construct in the model is prototype image. It refers to one's perception of the typical person one's own age who engages in the behavior (Gibbons, Gerrard, & Lane, 2003). For example, children and adolescents have been shown to have relative clear images of the types of people their age who smoke cigarettes or drink alcohol. Not surprisingly, these images are fairly unfavorable. Young people are aware of these social images and realize that, to some extent, people may associate that image with them if they were to engage in the behavior. Previous research based on the model has found that prototypes predict willingness to engage in the behavior (i.e., the more favorable the image, the more willing the participant reports being). To my knowledge, no studies have examined the effects of mood states on prototype images of risky health behaviors.

Role of dual-processing. The prototype model is considered a modified dual-process model, in that the different pathways reflect different styles of information processing. In many ways, the reasoned path (through BI) is similar to the rational processing system in Epstein's Cognitive Experiential Self Theory (CEST; Epstein, 1994; Epstein & Pacini, 1999), whereas the reactive path (through BW) is similar to the experiential processing system. According to CEST, the experiential processing system is more affect-based, and more likely to be influenced by heuristics; the rational system is more deliberative and analytic. Using this logic, the reactive path (as measured by BW) is expected to be more influenced by

affective states than the reasoned path (as measured by BI; Gibbons, Etcheverry, Stock, & Gerrard, 2008).

Risk perceptions. Another component of the prototype model is perceived vulnerability. Perceived vulnerability in the model refers to the perceptions of personal risk (i.e., the likelihood that one will experience the negative consequences of engaging in a risky behavior). Typically, perceived vulnerability is measured using a conditional measure (e.g., *If* you were to engage in unprotected sex, what is the likelihood you would contract an STD?). In the model, perceived vulnerability is considered part of the attitude construct and relates to both BI and BW (Gibbons et al., 2003). As noted earlier, positive mood states have been shown to be associated with lower levels of perceived risk (Salovey et al., 2001). This would suggest that those in a happy mood would be more likely to report more willingness and intentions to engage in a risky behavior, as they would feel less vulnerable to the potential negative consequences.

Current Line of Research

To address these gaps in the affect and health risk literature, a series of studies has been conducted examining the relation between happy and sad mood states and BW to engage in sexual behavior. These studies have shown an inverse relation between mood states and BW (Pomery, 2004; Pomery, 2008a). First, cross-sectional relations between affective states and BW were examined, controlling for BI. Willingness to have unprotected sex with one's boyfriend or girlfriend was negatively related to affect at each of the three waves of the panel data that were examined (though the relation was only significant at two of the waves). In contrast, there was a positive relation between participants' expectations to have sex in the next year at each of the three waves (again, it was only significant at two

waves). Although the measures used were not ideal for measuring BW and BI (they were earlier, cruder versions of the current measures, which lacked the specific wording and level of correspondence of the current measures), it still demonstrates that the two types of cognitions (BW and BI) are distinct and relate differently to affective states. Those in a more negative mood state at the time of each data collection reported they were more willing to have unprotected sex (i.e., engage in a risky sexual behavior) and less likely to have sex in the next year (perhaps representing depressive realism). Those in happy moods, on the other hand, reported lower willingness to have unprotected sex (i.e, were more risk-averse) and a greater likelihood of having sex in the next year (perhaps being overly optimistic).

An experimental laboratory study was also conducted, in which happy and sad mood were induced and the BW and BI measures used were more similar (Pomery, 2004). The study found that those in the sad conditions reported higher BW to engage in unprotected sex with a casual partner and those in positive moods reported lower levels of BW. The study also found that emotional states had little effect on participants' levels of BI. These findings were expected, given that BI is more stable across time than BW (i.e., BW is more labile; Gerrard, Gibbons, & Gano, 2003). Also, BW is presumed to be more affect-laden than BI (Gibbons et al, 2003), and therefore more influenced by it. It should be noted that these effects were moderated by the order of the BW and BI measures, such that the effect was only significant on the cognition measure (BW or BI) answered first. Typically, BW is higher when it is answered before BI. Since BI activates a more reasoned, analytic processing style, it becomes harder to "switch over" to a more experiential, heuristic processing style. The findings were similar for both scaled and open-ended BW and BI measures.

This research has given support to the motivational approach to affect's influence on risky decision-making (i.e., those in happy moods are inclined to be more risk-averse in order to maintain their mood, whereas those in negative moods are more risk-seeking, in order to improve their current mood state). As the previous study (Pomery, 2004) did not include a neutral mood condition, the relative strengths of the happy and sad mood states on risk-taking are unclear. In addition, another study of Iowa State University undergraduates supports the idea that mood states can have a motivating influence on sexual behavior (Pomery, 2008b). As part of a more lengthy questionnaire, students ($N = 667$) were asked to what extent having unprotected sex with both steady and casual partners would improve their mood if they were "feeling bad." Self-reported virgins (30% of the sample) were excluded from the analyses. On 7-point scales (anchored at 1 *Not at all* to 7 *Definitely would*), more than half of the participants (59%) answered with a 5, 6, or 7 with respect to steady partners (for casual partners, the number was 27%). In addition, participants were asked if they had ever had sex with either a steady or casual partner to improve their mood. For steady partners, 48% of participants reported having had sex "a few times" or more to improve their mood (20% for casual partners). Males were significantly more likely to report that having unprotected sex with steady and casual partners would improve their mood, that they'd considered having unprotected sex to improve their mood, and that they'd engaged in sex with casual partners to improve their mood. There were no gender differences for having had sex with a steady partner to improve one's mood. These findings suggest that young adults engage in sexual behavior (including more risky practices) in order to cope with negative emotions, which is consistent with the findings of Cooper and colleagues' research discussed earlier.

Conclusions

Although the findings of research on the influence of affect on risky behavior and cognitions, especially those that are health-related, are mixed, there is an increasing number of studies, including my previous studies, that support the idea that people in negative affective states are more likely to be risk-seeking in order to repair their mood. Likewise, there is evidence that positive affective states, when they are perceived as being "real" or "high-stakes," are more likely to be associated with risk-averse behavior and cognitions. My own line of research has shown that willingness to engage in risky sexual behaviors is related to mood states, whereas, consistent with the dual-processing nature of the prototype model, intentions are less influenced by mood. However, the mechanism(s) behind the influence that mood states have on BW is not clear.

Current Study

The current study was designed to tackle some of the unanswered questions in the literature, as well as address many of the aforementioned shortcomings of previous research. The current study induced positive (happy), negative (sad), and neutral affective states, and measured risk cognitions. One possible explanation for the affect-BW relation is that affect is influencing how participants' perceive the situations and judge the potential consequences. Generally, when making decisions, people consider the potential consequences of the behavior, which are typically positively or negatively valenced. How these outcome expectancies (i.e., expected consequences of an action) are judged, in turn, influences their intentions and ultimately their behavior choice (Ajzen, 1998). The current study explored whether affect influences the time spent reading positive as opposed to negative outcome expectancies, as well as the extent to which participants endorsed each outcome expectancy.

In addition, the current study aimed to study the relation between affect and risk cognitions for groups that were at varying levels of risk to engage in the risky behavior, based on the tenets of the prototype model. Participants were recruited based on their previously reported levels of BI and BW. It was expected that the effects of the mood manipulation would be stronger for the "at-risk, non-intending" group (i.e., low BI/high BW) than for the "intending" group (i.e., high BI/high BW). The "intending" group already has a plan (intention) of engaging in the risk behavior, and this is unlikely to be affected by mood states. The "at-risk" group, however, does not have engaging in the risk behavior as a goal state, and has more elastic risk cognitions. The relatively rigid nature of the "intending" group is more indicative of reasoned, analytic information-processing styles, whereas the "at-risk" group's processing style is indicative of more reactive, heuristic information processing. The percentage of adolescents and young adults that fall in the "at-risk" category varies as a function of the risk behavior under investigation, but typically falls between 20-25%.

The current study used a 2-pronged mood induction procedure, involving music, and guided imagery vignettes. Past research has shown that imagination-based mood inductions are particularly effective in inducing negative mood states (Gerrards-Hesse, Spies, & Hesse, 1994). Also, the music for the negative affect (sad) condition was selected so as not to make death salient. The study was a 3 (affect: positive, negative, and neutral) x 2 (prior BI/BW level: low BI/high BW vs. high BI/high BW) between-participants design. After the mood induction, participants were presented with outcome expectances, both positive and negative (e.g., positive: it would bring me physical pleasure; negative: I could contract an STD), regarding unprotected sexual intercourse with a casual partner (a clear risky health behavior).

The participants were asked questions regarding their endorsement of these outcome expectancies. In addition, time spent reading and responding was measured. Following the outcome expectancies, participants' willingness, perceived vulnerability, and other cognitions related to the risk behavior were measured.

The following hypotheses were posited:

1) The mood manipulation would influence which type of outcome expectancy (positive vs. negative) participants attended to and endorsed.
    a) Participants in the negative mood state conditions would be motivated to improve their mood state, and should more strongly endorse the positive outcome expectancies. This reflects the fact that those in sad mood states have been shown to report increased levels of BW.
    b) Participants in the positive mood conditions would attend to the positively-valenced outcome expectancies (e.g., a mood-congruent effect), spending more time reading and responding to them; however, they would not endorse these expectancies more. This reflects the past findings that those in happy mood states are more risk-averse and report lower levels of BW.
2) The effects of mood on the outcome expectancies measures would be stronger for the "risky non-intenders" (i.e., the low BI/high BW group), than for the "intenders" (i.e., the high BI/high BW group). The latter group is likely more set in how they would act in such a risky scenario, therefore they would need less time reading the outcome expectancies, and their risk cognitions (e.g., BW) would be less influenced by the mood manipulation. This finding would be consistent with the notion that the "intending" group is engaging in more analytic information-processing. The former

group, however, would tend to be more inexperienced with the behavior and the situation, and their BW should be more labile; therefore it was expected that the mood manipulation would have a stronger influence on this group, consistent with the notion that they were engaging in more heuristic information-processing.

3) With respect to PV, it was expected to be inversely related to BW, but be independent of the effect of mood on BW (consistent with the findings in Pomery, 2004). That is to say that although increased levels of perceptions of vulnerability were expected to be associated with lower levels of willingness, this was not anticipated to mediate any of the effects of the mood manipulation on BW. The effects of mood on the risk cognitions assessed at the end of the study (i.e., willingness, perceived vulnerability, intentions, and prototype image), would depend, in part, on how long the induced mood would last and whether or not participants' mood states were affected by their exposure to the positive and negative expectancies and answering the BW measure. If the mood manipulation is successful for the remainder of the study, it was expected that mood would not influence BI, but would be inversely related to BW and prototype—those in the sad mood condition would report the highest levels of willingness (Pomery, 2004) and most favorable prototype images.

METHOD

Participants.

Participants were current or former undergraduates at Iowa State University, receiving either class credit or monetary compensation for their participation. Participants who had completed their class credit or were no longer enrolled in a psychology course were paid $10 during the spring 2008 semester, and $15 during the summer of 2008 (43

participants received credit, 29 received $10; 40 received $15). Measures of behavior, BW, and BI for sex with a casual partner were collected during departmental mass-testing sessions. Participants were recruited from the two Spring 2008 mass-testing sessions (the second commonly referred to as "scale validation"), Summer 2008 mass-testing, and Fall 2007 mass-testing. Originally, participants were selected if they met the following criteria: non-virgins who reported at least minimal willingness to engage in casual sex and were either high or low on intentions to have casual sex in the future. Due to slow recruitment, the non-virgin criterion was dropped and anyone who reported at least minimal willingness to engage in casual sex was invited to participate. Two participants from the summer 2008 mass-testing session did not meet the willingness criteria, as their mass-testing data were not available at the time of their recruitment.

The final sample consisted of 112 participants (79 males, 33 females; 77 from Spring 2008 mass-testing, 22 from Fall 2007 mass-testing, 11 from Spring 2008 scale validation, and two from Summer 2008 mass-testing). Two participants' data were excluded from all analyses—one participant experienced problems with the musical mood induction, and was not exposed to any of the music, and the second was believed to be on her cell phone throughout the study, as the experimenter heard the phone ring and the participant talking. The expectancy endorsement items of an additional participant were excluded as she reported misreading the scaling of the items. Thus, the analyses are based on samples of 109 or 110 (see Table 1 for cell *N*s). Based on the findings of Pomery (2004), it was estimated that the effect size for induced mood on BW was moderate. Predicting a Cohen's *d* of 0.50, and a two-tailed α of .05, then 50 participants would be needed per condition to result in a power

Table 1. N*s per cell*

	Happy	Sad	Neutral	Total
High BW/ Low BI	18 (14)	21 (12)	16 (10)	55 (36)
High BW/High BI	20 (14)	18 (15)	17 (13)	55 (42)
Total	38 (28)	39 (27)	33 (23)	110 (78)

Note: *N*s in parentheses are the number of males per cell.

of .70 (for power = .80, 64 participants per cell would be needed). The number of participants, however, was influenced by the distribution of BW and BI measures in mass-testing (used to select the two risk level groups). Every effort was made to recruit a sample large enough to have the power to detect any significant effects.

Measures

Behavioral willingness. Willingness was measured using hypothetical scenarios during mass-testing sessions and during the experiment (see Appendices A & B). For example, one risky sex scenario involved attending a party and meeting someone attractive that the participant did not know very well (i.e., a casual partner), and neither the participant nor the other person had a condom available. After each scenario, participants were asked to rate how willing they would be to engage in risky sexual behaviors (e.g., how willing to have sexual intercourse), using a 7-pt. scale (1 *Not at all* to 7 *Very willing*). The experimental BW index was created by averaging the four items from the two scenarios (α = .87). The BW scenarios varied across mass-testing sessions, however.[2] Spring and Summer 2008 mass-testing included measures from two scenarios (one that mentioned that a condom was not available, one that did not mention condoms); Spring 2008 scale validation participants only

had the version of the scenario that specifically mentioned no condoms being available; Fall 2007 mass-testing participants' BW was only assessed for the scenario that did not mention condoms. To address this issue of BW items varying across mass-testing sessions, each participant's scores were standardized *within* their mass-testing session for every BW measure they answered. Then these *z*-scores were averaged and used as the BW mass-testing index. The *M*s and *SD*s for the various BW measures at each mass-testing session are shown in Appendix C.

Behavioral intentions. Intentions (and expectations) to engage in unprotected, casual sex were assessed during both the mass-testing and experimental sessions (see Appendices A & B. Behavioral expectations (BE) are similar to intentions in that they assess the extent to which one thinks or expects to do a behavior in the future, as compared to their plans to do the behavior. Many researchers consider BI and BE to represent the same core construct (Ajzen & Fishbein, 2005). In the experimental session, there were three BI items and three parallel BE items: "In the next 6 months, do you intend to [how likely is that you will] have casual sex / have sex without a condom / have casual sex without a condom?" Each item was measured on a 7-pt. scale. These six items were averaged to form the experimental BI/BE index ($\alpha = .70$). As with BW, the BI and BE questions varied across mass-testing sessions. All four sessions included a measure of intention to have sex with a casual partner in the next 6 months, and all but one (Spring 2008 scale validation) included a measure of expectation of having sex with a casual partner. With the exception of Fall 2007 mass-testing, all answered an item assessing intention to have sex without a condom. Two sessions (Spring 2008 mass-testing and scale validation) assessed intentions to have sex with a casual partner without a condom. As done with BW, participants' BI and BE items were standardized within their

mass-testing session and then averaged to form their mass-testing BI/BE index. See Appendix C for *M*s and *SD*s of these measures for each mass-testing session.

Outcome expectancies. During the experimental session, participants were presented with both positive and negative outcome expectancies (see Appendix D). For each expectancy, they first read the statement and clicked "next" and then were asked two questions: (a) did this go through your mind (in this situation; 1 = *No*, 2 = *Maybe*, 3 = *Yes*) and (b) how important would this be to you (3-pt scale: *Not at all*, *Somewhat*, *Very*). The endorsements for "go through your mind" and importance were separately averaged for the eight positive and eight negative items (Positive "go through mind" α = .79; Positive "important to you" α = .78; Negative "go through mind" α = .60; Negative "important to you" α = .74). In addition, the time each participant spent reading and responding to each outcome expectancy was automatically recorded by the computer using MediaLab software. Due to a programming error, reaction time was not measured for one of the positive outcome expectancies. The reaction times were transformed using a natural log transformation prior to creating indices.

Behavior. Previous behavior was measured in mass-testing (see Appendix A). All participants reported their lifetime number of sexual partners in mass-testing. However, the other behavior items varied across the mass-testing sessions. All but Spring 2008 scale validation included a measure of prior sex with casual partners; all but the Fall 2007 mass-testing session included a measure of how many times participants' had engaged in casual sex while not using a condom. In addition, all but Fall 2007 included a measure of how often they had a condom accessible when they went out to a party or a bar (5-pt. scale).

Perceived vulnerability. Perceived risk was measured in the experimental session (see Appendix B). The participants were asked three questions about the likelihood that a negative outcome, specifically contracting an STD, would occur *if* they were to engage in the behavior (7-pt. scale). These three items were averaged to form the PV index ($\alpha = .78$).

Prototype. Participants were asked to think about the typical person their age who engages in casual sex without using a condom. Participants then rated how likely it was that the person was smart, confused, popular, immature, "cool" (sophisticated), self-confident, independent, careless, unattractive, dull (boring), considerate, and self-centered. The negative adjectives were reverse-scored and an index was made by averaging the 12 scores ($\alpha = .78$).

Baseline reading and response time. Four filler items were used to measure baseline reading and response times. These items went along with the cover story. The natural logs of the reaction times were averaged to form the baseline response time measure ($\alpha = .66$).

Mood questionnaire. A mood adjective scale was used in order to assess the effectiveness of the mood induction (see Appendix E). The scale was developed during earlier piloting sessions and has been used in previous laboratory studies (e.g., Pomery, 2004).

Experimental Procedure

Initial cover story. First, participants in the experimental session read and signed an informed consent form. After they had completed the form, they were told that they would be taking part in two separate studies. One study, they were told, involved how well they could imagine and recall certain scenarios, and how background music affected their performance. They were told that for this study, they would be asked to imagine various scenarios and think about them in-depth. The other study was then described as more of a filler task ("in

between the two imagery tasks…"). The purpose of the study, they were told, was to learn more about how college students reacted to complex decision-making situations. After the "filler" task (i.e., the outcome expectancies and risk cognitions measures), participants were be led to believe that they would repeat the imagery tasks and answer questions related to it.

Mood induction. After being led to individual cubicles, participants were told they were in the "habituation condition," which means that they would hear background music for the remainder of the experiment. Participants in the negative affect condition listened to selections from Barber's *Adagio for Strings*; Mahler's *Symphony No. 5 in C# minor*, participants in the positive affect condition listened to selections from Mozart's *Eine Kleine Nachtmusik*, Bach's *Brandenburg Concerto Nos. 2 and 3*, and Handel's *Water Music*; the neutral mood condition heard selections from Debussy's *La Mer* and *Prélude à l'après-midi d'un faune*. These selections have been used to induce affective states in other research (e.g., Balch, Myers, & Papotto, 1999; Hufford, 2001; Niedenthal et al., 2000).

Participants were instructed to complete the guided imagery task (see Appendix F). An audio tape was played over the intercom or on a tape player, depending on the laboratory in which the participant was being run, (see Appendix E for scenarios). There was approximately 40 seconds between scenarios. Music was playing in the background while participants completed the task. The scenarios were adapted from vignettes used in other research to induce happy and sad mood states (Mayer, Allen, & Beauregard, 1995). When the guided imagery task was completed, participants were instructed to complete the "Current Feelings" questionnaire (the mood manipulation check; see Appendix D).

Presentation of scenario. Next, the participants were asked some filler questions related to the cover story (e.g., where they typically get their news from); in addition, these

items were used to determine participants' baseline reading and response times. They were then told that they would be asked to read and answer questions regarding part of a survey that asked respondents to report how they would act in certain situations. In order to increase the perceived credibility, they were told the survey was recently conducted on a nation-wide sample of young adults. Then, the computer "randomly" selected a situation for them (i.e., implying that other participants were viewing different scenarios). All participants were then presented with the first BW scenario described in the Measures section and asked to imagine themselves in that scenario (see Appendix C).

Outcome expectancy measures. After being exposed to the scenario for 3 minutes, participants were randomly presented with the 16 outcome expectancies (see Appendix C for 8 positive and 8 negative outcome expectancies). They were told that these were some of the more common reasons the survey respondents gave as to why they would act a certain way in the scenario. First, they read the outcome expectancy and clicked "next." Then, they were asked two questions about their endorsement of each scenario: whether the outcome expectancy came to mind and how important it would be to them in that scenario (each on a separate screen and prefaced by the original expectancy, as they could not look back): Unbeknownst to participants, reaction times for each of the following were recorded: a) reading each outcome expectancy, b) answering whether it came to mind, and c) answering how important it was to them. Each reaction time was analyzed separately.

Additional measures and debriefing. Following the presentation of the expectancies, participants were asked questions regarding their BW, PV, BI, and prototype image, supposedly to better understand their reaction to the survey results (see Appendix B). These measures, in fact, were additional dependent variables in the experiment. When the

participants had completed these measures, they were debriefed using a spiral procedure. Participants were first asked about their suspicions regarding the experiment in general and then, more specifically, regarding the imagery task, the music, the survey task, and the questionnaires. They were told the purpose of the study and it was revealed that there would be no additional parts to the study (i.e., they wouldn't have to repeat the guided imagery task or answer any more questions). The most common suspicions were that there was not going to be a second study (n = 12) or that the selection of the situation was not random (n = 6). Around ten percent mentioned mood states prior to the debriefing (e.g., picked up on the fact that the music and scenarios went together and were depressing or uplifting). No participants were excluded from analyses based on their suspicion level, as none was able to specifically guess the studies' hypotheses (indeed, although some participants reported suspicions, they still appeared to believe the general cover story).

RESULTS

Randomization

One-way ANOVAs were conducted on the mass-testing measures to determine whether randomization was successful across the three mood conditions. These analyses showed that randomization was achieved in that none of the F-statistics was significant at the .05 level. The following were marginally significant, however: willingness to have oral sex with a casual partner (in both scenarios, ps < .10), intentions to have casual sex without a condom (p < .10), number of lifetime sexual partners (p = .07), and past behavior of casual sex without a condom (p = .08). In each case, the average for those in the sad mood conditions was higher than the other two conditions (though not significantly higher). Thus, there appears to be a slight tendency for those in the sad mood condition to have reported

riskier cognitions and behavior prior to the laboratory session. Consistent with this tendency, and also not significant, virgins were less likely to be in the sad condition ($n = 2$) than the other two conditions ($ns \geq 6$), χ^2 (2) = 4.43, $p = .11$. Chi-square analyses were conducted on the demographic variables taken during the mass-testing sessions. Gender, ethnicity, and marital/relationship status were all evenly distributed across the three conditions.

Mood Induction

The 10 mood adjectives were combined into a single index. The mean mood score for each condition was as follows (with higher values indicating a more positive mood state): sad $M = 2.86$ ($SD = 0.71$, 95% CI: 2.63-3.09), neutral $M = 3.82$ ($SD = 0.52$, 95% CI: 3.63-4.00), and happy $M = 4.24$ ($SD = 0.49$; 95% CI: 4.08-4.40); the one-way ANOVA was significant, $F(2, 107) = 55.11$, $p < .001$. The mean for each condition was significantly different from the other two conditions ($ps \leq .008$). The mood induction thus appeared to have been successful.

Descriptive Statistics

Outcome expectancies. The negative outcome expectancies were more highly endorsed than the positive expectancies ($ts \geq 7.58$, $ps < .001$). The most common negative outcomes that "came to mind" were pregnancy, contracting an STD, and difficulties in establishing a real relationship with the partner (see top half of Table 2). These negative outcomes were also rated the most important. The three most common positive outcomes that came to mind were physical pleasure, enjoyment of giving partner pleasure, and feeling sexy (see bottom half of Table 2). These were also the top three positive outcomes in terms of importance. Not surprisingly, the two endorsements ("did this go through your mind?" and "would this be important to you?") were highly correlated for both the negative and positive outcome expectancies (both $rs = .73$, $p < .001$). Endorsements of negative outcome

expectancies were significantly inversely related to endorsements of positive outcome expectancies ($rs \leq -.21$, $p < .03$), with one exception (Negative and Positive "come to mind" were unrelated, $r = -.06$, NS). The reaction times for the negative outcome endorsements and the two positive endorsements were positively correlated ($rs \geq .22$, $ps \leq .02$). Likewise, the reaction time for reading the expectancies was also associated with the endorsement reaction times **(***rs* ≥ .19, *ps* < .05).

Exploratory factor analysis was conducted on each endorsement index using principal components extraction and an oblique rotation (see Tables 3 & 4). For the negative "come to mind" items, three factors emerged. The following items loaded onto the first factor: not wanting to be seen as someone who sleeps around, would feel sinful, would feel bad (cheap, dirty) afterwards, and not liking spur of the moment activities; the second factor consisted of two items: not wanting to make a bad impression on the other person and difficulty in establishing a real relationship with the partner. Finally, the third factor had two items, worries regarding pregnancy and STDs. A review of these factors suggests that the third factor taps into the primary health-related negative consequences (pregnancy and STDs), whereas the second factor taps into consequences focusing around the partner (creating a bad impression, chance of future relationship). The first factor appears to be a "catch-all" for the remaining negative consequences, which primarily focus on non-health related individual reasons (e.g., feed bad afterwards, sinful). For the factor analysis on the importance of these items, two factors emerged. All the items loaded onto the first factor, with the exception of pregnancy and STDs, which loaded onto the second factor. Unexpectedly, the two types of endorsements revealed different factor structures.

Table 2. *Individual Negative and Positive Outcome Expectancy* Ms *and* SDs

	Did this go through your mind?		Would this be important to you?	
Negative Outcome Expectancies	*M*	*SD*	*M*	*SD*
I would NOT have sex because…				
I don't want to get (a girl) pregnant. I'm too young for that kind of responsibility.	2.62	0.70	2.85	0.47
I would be afraid of getting a sexually transmitted disease (STD) like herpes, or worse, HIV.	2.50	0.82	2.84	0.41
It would be hard to establish a "real" relationship with this person in the future. If I like him/her, I'd wait.	2.49	0.77	2.50	0.59
I don't want the other person to get the impression that I often have sex with someone I've just met.	2.19	0.92	2.30	0.73
I don't want to be seen as someone who sleeps around. I'm not that type of person.	2.03	0.95	2.17	0.86
I would feel bad afterwards. It would make me feel cheap or dirty.	1.73	0.87	1.86	0.75
I would feel sinful, as it goes against my personal morals and religious beliefs. I was not raised to act like this.	1.62	0.86	1.71	0.72
I don't like to do things on the spur of the moment. I prefer things to be more planned.	1.35	0.64	1.45	0.64
Positive Outcome Expectancies				
I would have sex because…				
I would greatly enjoy the physical pleasure (e.g., achieving an orgasm).	2.04	0.89	1.96	0.71
It would give me pleasure to give my partner an orgasm. I enjoy making my partner happy.	1.83	0.92	2.14	0.74
It would make me feel sexy (attractive) to be desired by someone I don't know well.	1.61	0.82	1.61	0.68
It would make me feel good about myself. I'd feel like a better person (boost my self-esteem).	1.52	0.75	1.52	0.62
It would be a great stress reliever. Having sex would help me to relax.	1.47	0.79	1.53	0.65
It would strengthen our relationship by increasing the attraction we feel toward each other and cementing the bond we have.	1.47	0.73	1.50	0.62
It would distract me from all the things I was currently worried about (for example, money, studying).	1.40	0.71	1.42	0.60
It would help my reputation, and improve my standing among my peers.	1.28	0.61	1.21	0.43

Table 3.*Negative Outcome Expectancy Endorsement Factors*

	Come to Mind			Important	
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2
I would NOT have sex because…					
I don't want to get (a girl) pregnant. I'm too young for that kind of responsibility.			.701		.777
I would be afraid of getting a sexually transmitted disease (STD) like herpes, or worse, HIV.			.799		.702
It would be hard to establish a "real" relationship with this person in the future. If I like him/her, I'd wait.		.878		.620	
I don't want the other person to get the impression that I often have sex with someone I've just met.		.772		.778	
I don't want to be seen as someone who sleeps around. I'm not that type of person.	.536			.823	
I would feel bad afterwards. It would make me feel cheap or dirty.	.624			.685	
I would feel sinful, as it goes against my personal morals and religious beliefs. I was not raised to act like this.	.587			.682	
I don't like to do things on the spur of the moment. I prefer things to be more planned.	.769			.494	

Table 4. *Positive Outcome Expectancy Endorsement Factors*

	Come to Mind		Important
	Factor 1	Factor 2	Factor 1
I would have sex because…			
I would greatly enjoy the physical pleasure (e.g., achieving an orgasm).	.509		.714
It would give me pleasure to give my partner an orgasm. I enjoy making my partner happy.	.706		.628
It would make me feel sexy (attractive) to be desired by someone I don't know well.	.565		.695
It would make me feel good about myself. I'd feel like a better person (boost my self-esteem).	.785		.688
It would be a great stress reliever. Having sex would help me to relax.		.511	.652
It would strengthen our relationship by increasing the attraction we feel toward each other and cementing the bond we have.		.819	.441
It would distract me from all the things I was currently worried about (for example, money, studying).		.742	.569
It would help my reputation, and improve my standing among my peers.	.852		.601

For the positive outcome expectancies, two factors emerged for the "come to mind" endorsements. It would make me feel sexy, raise self-esteem, improve reputation, physical pleasure, and pleasuring partner all loaded onto the first factor. The second factor consisted of strengthening the relationship, stress relief, and distraction from stressors. The first factor appears to a "catch-all" that taps into the most popular positive consequences. The second

factor has both a stress relief component (distraction from worries, stress reliever) as well as relationship component (strengthen relationship). A one-factor solution was found for the positive importance endorsements.

Additional experimental measures. For *M*s, *SD*s, and correlations for all of the experimental measures, see Table 5. Participants reported being at least somewhat willing to engage in sex with a casual partner without using a condom ($M = 4.55$, $SD = 1.28$ on a 7-pt. scale). As expected, average BI/BE was lower, with $M = 2.46$ ($SD = 1.19$). Participants' perceived prototype favorability was 3.76 ($SD = 0.75$) and their perceived vulnerability was 5.30 ($SD = 1.08$), both on 7-pt. scales. All of the items were correlated, with BW, BI/BE, and prototype being positively correlated with each other. PV was negatively correlated with BW, BI/BE, and prototype. The same pattern of associations was found with the outcome expectancy endorsements, as BW, BI/BE, and prototype were positively correlated with endorsement of positive outcome expectancies ($rs > .25$, $ps < .008$) and negatively correlated with endorsement of negative outcome expectancies ($rs < -.23$, $ps < .02$); PV was inversely related to the positive outcome endorsements ($rs < -.21$, $ps < .03$) and positively associated with negative outcome endorsements ($rs > .24$, $ps < .01$). The lone exception to this pattern was the correlation between BI/BE and negative "come to mind" endorsement, which was in the same direction but did not reach significance ($r = -.12$, NS).

Table 5. *Correlations, Ms, and SDs for Primary Measures*

		1	2	3	4	5	6	7	8	9	10	11
1	Neg exp. mind											
2	Factor 1	**.86**										
3	Factor 2	**.72**	**.43**									
4	Factor 3	**.31**	-.04	-.03								
5	Neg exp. import.	**.73**	**.77**	**.51**	-.06							
6	Factor 1	**.73**	**.81**	**.54**	-.14	**.98**						
7	Factor 2	.17^{+}	.07	.01	**.34**	**.37**	.16^{+}					
8	Pos exp. mind	-.06	-.14	-.11	.23*	-.21*	-.23**	.05				
9	Factor 1	-.08	-.17^{+}	-.11	.25**	-.26*	-.23*	.08	**.94**			
10	Factor 2	-.01	-.04	-.07	.11	-.16	-.16^{+}	-.02	**.79**	**.52**		
11	Pos exp. important	-.29**	**-.36**	-.21*	.12	**-.31**	**-.34**	.04	**.73**	**.73**	**.51**	
12	Neg exp. read RT	-.02	.01	-.10	.04	.06	.04	.13	.13	.12	.11	.05
13	Neg exp. mind RT	-.05	.05	-.09	-.13	.01	.06	-.19*	-.04	-.06	.03	-.03
14	Neg exp. import RT	-.07	.03	-.05	-.19*	.09	.10	-.01	-.05	-.03	-.08	-.01
15	Pos exp. read RT	-.05	-.05	-.09	.07	-.05	-.07	.08	.08	.07	.07	.07
16	Pos exp. mind RT	-.08	-.12	-.06	.09	-.19*	.16^{+}	-.15	.14	.14	.10	.16^{+}
17	Pos exp. import RT	-.05	-.01	-.06	-.06	-.02	-.01	-.07	-.01	.03	-.07	.03
18	BW	**-.36**	**-.47**	-.29**	.25**	**-.46**	**-.52**	.06	**.38**	**.42**	.17^{+}	**.53**
19	BI/BE	-.12	-.19*	.01	.03	-.28**	-.28**	-.05	.27**	.28**	.16^{+}	**.37**
20	PV	.24**	.21*	.12	.13	**.35**	**.33**	.19*	-.21*	-.19*	-.16^{+}	-.24**
21	Prototype	-.23**	-.24**	-.21*	.08	**-.34**	**-.35**	-.05	.25**	.29**	.12	**.38**
22	MT BW	**-.35**	**-.44**	-.27**	.20*	**-.45**	**-.50**	.06	**.37**	**.39**	.21*	**.51**
23	MT BI/BE	-.17^{+}	-.28**	-.01	.06	**-.35**	**-.36**	-.06	.22*	.21*	.16^{+}	**.31**
	M	2.07	1.68	2.34	2.56	2.21	2.00	2.85	1.58	1.66	1.45	1.62
	SD	0.42	0.57	0.73	0.58	0.39	0.50	0.34	0.50	0.58	0.55	0.40
	Scale Range	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3

Note: $N = 109$ or 110. All **bolded** correlations are sig. $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, $^{+}$ $p \leq .10$; Neg = Negative, Pos = Positive; exp. = expectancy, mind = would this come to mind, import = would this be important to you, RT = response time, BW = behavioral willingness, BI/BE = behavioral intentions and expectations, PV = perceptions of vulnerability.

Table 5. *Correlations, Ms, and SDs for Primary Measures (Continued)*

		12	13	14	15	16	17	18	19	20	21	22	23
1	Neg exp. mind												
2	Factor 1												
3	Factor 2												
4	Factor 3												
5	Neg exp. import.												
6	Factor 1												
7	Factor 2												
8	Pos exp. mind												
9	Factor 1												
10	Factor 2												
11	Pos exp. important												
12	Neg exp. read RT												
13	Neg exp. mind RT	**.25**											
14	Neg exp. import RT	**.35**	**.56**										
15	Pos exp. read RT	**.80**	.19*	.23*									
16	Pos exp. mind RT	**.30**	**.50**	.29**	**.41**								
17	Pos exp. import RT	**.35**	**.38**	**.60**	**.38**	**.64**							
18	BW	-.09	.03	-.05	.07	.19*	-.01						
19	BI/BE	.00	-.07	-.02	-.01	.04	.02	.27**					
20	PV	-.07	.00	.02	-.14	-.27**	-.14	-.26**	**-.47**				
21	Proto	.21*	.07	.01	.26**	**.31**	.16^{+}	**.33**	.15	**-.34**			
22	MT BW	.08	-.13	-.04	.12	.08	.03	**.66**	**.37**	-.25**	**.38**		
23	MT BI/BE	.00	-.05	-.01	.08	.16^{+}	.06	**.36**	**.50**	-.27**	.22*	**.48**	
	M	8.52	7.64	7.29	8.49	7.59	7.36	4.55	2.46	5.30	3.76	0.69	0.25
	SD	0.22	0.31	0.42	0.24	0.31	0.48	1.28	1.19	1.08	0.75	0.65	0.85
	Scale Range	7.99-9.07	6.90-8.63	6.32-8.33	7.99-9.13	6.98-8.37	6.01-8.50	1-7	1-7	1-7	1-7	-0.68-1.91	-0.72-2.84

Note: $N = 109$ or 110. For the reaction times, the ranges are reported instead of the scale range. All **bolded** correlations are sig. $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, $^{+}$ $p \leq .10$; Neg = Negative, Pos = Positive; exp. = expectancy, mind = would this come to mind, import = would this be important to you, RT = response time, BW = behavioral willingness, BI/BE = behavioral intentions and expectations, PV = perceptions of vulnerability.

Examining the correlations among the endorsement factors discussed earlier and the experimental cognition measures showed a similar pattern, with one notable exception. Having the outcomes of pregnancy and STDs come to mind (factor 3) was *positively* correlated with BW, $r = .25$, $p = .009$. The other two factors for negative "come to mind" were significantly inversely related to BW (rs < -.29, ps < .002), as would be expected. Interestingly, factor 3 was not associated with BI/BE, $r = .03$, NS. Finally, the reaction times for the outcome expectancies were generally unassociated with responses to the BW, BI/BE, prototype, and PV measures. Again, there were a few exceptions: reaction time for the positive "come to mind" endorsement was positively correlated with BW (r =.19, $p = .04$) and prototype ($r = .31$, $p > .001$), and negatively correlated with PV ($r = -.27$, $p = .004$). These findings suggest that people who were faster at responding whether or not positive outcomes came to mind (i.e., lower reaction times) later reported lower BW and prototype favorability, and higher levels of perceived risk.

It is interesting to note a general tendency for the correlations between the endorsement items and BW were stronger than the correlations between the endorsement items and BI/BE. In the case of negative outcome expectancy endorsements, many of the differences in correlations reached significance: (a) BW/Negative outcome expectancy "come to mind" $r = -.36$, BI/BE/Negative outcome expectancy "come to mind" $r = -.12$, $t = 2.22$, $p = .03$; (b) BW/Negative outcome expectancy "come to mind" factor 1 $r = -.47$, BI/BE/ Negative outcome expectancy "come to mind" factor 1 $r = -.19$, $t = 2.79$, $p < .01$; (c) BW/Negative outcome expectancy "come to mind" factor 2 $r = -.29$, BI/BE/Negative outcome expectancy "come to mind" factor 2 $r = .01$, $t = 2.66$, $p < .01$; and (d) BW/Negative outcome expectancy "important" factor 1 $r = -.52$, BI/BE/Negative outcome expectancy

"important" factor 1 r = -.28, t = 2.35, p = .02.Thus, higher levels of BW are associated with less consideration of negative consequences of engaging in the behavior. Although BI/BE was also negatively correlated with endorsement of negative outcome expectancies, the associations were significantly weaker. This pattern is consistent with the prototype model as, relative to intentions, willingness involves little precontemplation of the behavior or its consequences (Gerrard et al., 2002; Gerrard et al., 2008; Gibbons, Gerrard, Ouellette, & Burzette, 1998). These findings lend support to the idea that BW and BI are separate constructs.

Mass-testing items. The average (standardized) scores for both BW and BI/BE taken during the mass-testing sessions were positive (*M*s = 0.69 and 0.25, respectively). Thus, the sample had higher than average BW compared to their peers (in the mass-testing sessions) and slightly higher BI/BE. The modal response on the number of sexual partners' in one's lifetime was one partner, though the mean was close to three partners. BW and BI/BE were positively correlated (r = .48, p < .001). These measures were also positively associated with BW and BI/BE assessed during the experimental session (mass-testing BW/experimental BW: r = .68, p < .001; mass-testing BI/BE, experimental BI/BE, r = .50, p < .001). Those in the high BW/high BI group had significantly higher levels of both BI/BE and BW than the high BW/low BI group (BI: t = 12.51, p < .001; BW: t = 2.82, p = .006). Table 6 shows the *M*s and *SD*s for BW and BI/BE in each of the six cells. In addition, those in the high BW/high BI group had significantly more previous sexual partners than the high BW/low BI group (t = 3.13, p = .002). Of some concern, there was a significant difference in MT BW for those in the sad mood conditions, with those in the high BW/high BI group having higher scores than those in the high BW/low BI conditions (t = 2.01, p = .05). Ideally, these two

Table 6. *Means and SDs for Experimental and Mass-Testing BW and BI BE*

Item	Happy	Sad	Neutral
High BW / Low BI			
Experimental BW	4.35 (1.27)	4.46 (1.30)	4.14 (1.45)
Experimental BI/BE	1.53 (0.68)[a]	2.11 (0.65)[a]	2.18 (1.53)
Mass-Testing BW	0.39 (0.61)	0.67 (0.62)[b]	0.49 (0.63)
Mass-Testing BI/BE	-0.42 (0.27)[a]	-0.32 (0.28)[a]	-0.49 (0.23)[a]
High BW / High BI			
Experimental BW	4.93 (1.10)	5.11 (1.11)	4.21 (1.30)
Experimental BI/BE	2.92 (0.88)	3.34 (1.45)	2.66 (0.92)
Mass-Testing BW	0.77 (0.71)	1.08 (0.53)	0.75 (0.66)
Mass-Testing BI/BE	0.81 (0.78)	1.13 (0.69)	0.79 (0.68)

Note. Experimental BW and BI/BE were on 1-7 scales (BW: $M = 4.55$, $SD = 1.28$; BI/BE: $M = 2.46$, $SD = 1.19$), Mass-Testing BW and BI/BE were the means of *z*-scores (BW: $M = 0.69$, $SD = 0.65$; BI/BE: $M = 0.25$, $SD = 0.85$). Superscripts indicate significant differences between the High BW/Low BI and High BW/High BI groups: [a] $ts \geq 3.74$, $ps < .001$, [b] $t = 2.01$, $p = .05$

groups would differ only on their prior BI and not BW. The differences in MT BW were not significant, however, for the high vs. low MT BI groups in the other two mood conditions.

Gender differences. Females tended to be less risk-taking in their responses compared to males (e.g., lower BW in both mass-testing session and in the laboratory, higher levels of endorsement of negative outcome expectancies). Therefore, gender was controlled for in all of the following analyses.[3]

Comparison of Responses to Positive vs. Negative Outcome Expectancies

To test the first two hypotheses, that endorsement and reading/response time for the positive vs. negative outcome expectancies would differ as a function of mood condition and prior BI/BE, repeated-measures ANOVAs were conducted on each of the five expectancy-related dependent measures (with the within-participant variable being valence of items: positive or negative; see Table 7). For these analyses, mass-testing BI/BE was dichotomized using a median split. It is important to keep in mind that all participants were selected based on their higher-than-average levels of willingness, and therefore the mass-testing BI/BE factor is comparing the high BW/low BI and high BW/high BI groups.

Endorsements. For the first Mood Condition x Mass-testing BI/BE x Measure Valence repeated-measures ANOVA on participants' endorsement of whether the outcome expectancies came to mind, none of the between-participants' effects reached significance (Fs $\leq$ 1.68). There was a main effect for valence, such that negative outcome expectancies were more likely to come to mind than positive expectancies (F = 57.41, p < .001); this effect was qualified by a Valence x Gender interaction (F = 15.44, p < .001), with this difference in endorsement of positive vs. negative endorsements being greater for females than for males.

The repeated-measures ANOVA for the importance ratings of the positive and negative outcome expectancies showed similar valence (F = 92.98, p < .001) and Valence x Gender effects (Fs $\geq$ 19.53, ps < .001). In addition, there was a significant main effect for prior BI/BE (F = 4.12, p = .045) qualified by an interaction with valence (F = 7.95, p = .006). Low BI/BE participants were more likely to endorse negative outcome expectancies as being important and less likely to endorse the importance of positive expectancies compared to

Table 7 *Adjusted* Ms *and Significant Effects for Repeated-Measures ANOVAS*

	Low BI/BE (in MT)			High BI/BE (in MT)			
	Happy	Sad	Neutral	Happy	Sad	Neutral	Sig. Effects
Come to mind?							ME Valence ($p < .001$)
Positive Outcome Expectancies	1.58	1.55	1.42	1.53	1.71	1.67	MT BI/BE x Valence ($p < .10$)
Negative Outcome Expectancies	2.19	2.10	2.04	1.97	2.01	2.08	
Important to you?							ME Valence ($p < .001$)
Positive Outcome Expectancies	1.55	1.66	1.53	1.63	1.83	1.48	ME MT BI/BE ($p < .05$)
Negative Outcome Expectancies	2.42	2.32	2.26	2.02	2.09	2.16	ME Mood ($p = .09$) MT BI/BE x Valence ($p = .006$)
RT Read expectancy							ME Mood ($p = .08$)
Positive Outcome Expectancies	5.59	5.57	5.60	5.60	5.47	5.60	
Negative Outcome Expectancies	5.48	5.43	5.42	5.40	5.31	5.48	
RT Come to mind?							MT Bi/BE x Valence ($p < .05$)
Positive Outcome Expectancies	4.67	4.80	4.62	4.91	4.78	4.83	
Negative Outcome Expectancies	4.73	4.78	4.51	4.63	4.70	4.65	
RT Important to you?							MT BI/BE x Valence ($p = .03$)
Positive Outcome Expectancies	4.55	4.75	4.44	4.68	4.58	4.72	MT BI/BE x Mood ($p = .07$)
Negative Outcome Expectancies	4.43	4.60	4.34	4.34	4.32	4.36	

those with higher BI/BE. There was also a marginally significant main effect for mood condition ($F = 2.43$, $p = .09$); collapsing across valence, the estimated marginal means were 1.97 for those in the sad condition, 1.90 for those in the happy condition, and 1.86 in the

neutral condition. Participants in the sad condition rated more outcome expectancies as being important than those in either the happy or neutral mood conditions.

Reaction times. There were three reaction time repeated-measures ANOVAs conducted. The first for the time it took to read the outcome expectancy and click next, the second measured the time to respond to whether it came to mind, and finally the third measured the time to report how important it was. All of these analyses controlled for baseline reading and response time and differences in average word length between the positive and negative outcome expectancies. Those who responded quickly at baseline or were female were faster at reading the outcome expectancy and clicking next, as shown by significant main effects for baseline reaction time and gender (Fs $\geq$ 8.23, ps $\leq$ .005). There was also a marginally significant main effect for mood condition (F = 2.54, p = .08); collapsing across outcome expectancy valence, the estimated marginal means were lower for those in the sad mood condition (M = 5.44) than for those in either the happy (M = 5.51) or neutral (M = 5.53) conditions.

With respect to the "come to mind" reaction time repeated-measures ANOVA, only two effects reached significance: baseline response time main effect (F = 28.41, p < .001) and a BI/BE x valence interaction (F = 3.98, p < .05). Those with low prior BI/BE spent roughly the same amount of time reading and responding to the positive and negative outcome expectancies (M = 4.70 for positive outcome expectancies, M = 4.67 for negative), whereas those with higher prior BI/BE spent more time on the positive outcome expectancies (M = 4.84) compared to the negative outcome expectancies (M = 4.66). The positive outcomes either appealed to the high BI/BE participants (they spent longer re-reading them) and/or they spent longer deciding whether these outcomes had come to mind. Reaction times

tended to be longer for participants who responded with "Maybe." Separate ANOVAs were run to determine whether participants differed in how often they answered "Maybe" (2 on a 3-pt scale) as a function of their mood and prior BI. No significant differences were found, as neither mood nor mass-testing BI/BE (or their interaction) were related to how often participants' responded with a "Maybe."

Finally, a repeated-measures ANOVA was conducted on the time it took participants to read the positive or negative outcome expectancy (for the third time) and respond to whether or not it was important to them. Again, the baseline reaction time had a significant main effect ($F = 22.38$, $p < .001$). As with the "come to mind" reaction time, there was a significant BI/BE x Valence interaction ($F = 4.98$, $p = .03$) and the estimated marginal means showed the same pattern. The difference in reaction times for the positive and negative outcome expectancies was smaller for those with low BI/BE (positive: $M = 4.58$, negative: $M = 4.46$), than for those with high BI/BE (positive $M = 4.66$; negative: $M = 4.34$). There was a marginally-significant interaction between mood condition and BI/BE ($F = 2.78$, $p = .07$). For those in the happy condition, the response time was similar for high and low BI/BE participants (Ms = 4.49 vs. 4.51); for those in the sad mood condition, those with lower BI/BE took longer to respond than those with high BI/BE (Ms = 4.68 vs. 4.45, respectively). Finally, for participants in the neutral mood condition, those with lower BI/BE responded more quickly than those with high BI/BE (Ms = 4.39 vs. 4.54, respectively).

Negative Outcome Expectancies

Endorsements. To further examine the repeated-measures ANOVAs, separate analyses were run for the positive and negative outcome expectancies. To improve statistical power, regression analyses were used and prior BI/BE was left as a continuous measure

rather than being dichotomized. Mood condition was dummy-coded such that D1 was coded as 1 = happy condition, 0 = sad and neutral mood conditions and D2 equaled 1 for the sad condition and 0 for the other conditions; thus, the neutral condition was used as the comparison group in all of the regressions. For each regression, the dependent variable was regressed on gender, prior BI/BE, D1, D2, D1 x BI/BE, and D2 x BI/BE (and also baseline response time for the reaction time regressions; see Table 8). For the negative "come to mind" endorsements, the only significant effect was for gender. For the full index, factor 1, and factor 2, females reported that the negative outcomes came more frequently to their mind than the males; the reverse was found for factor 3 (which consisted of the pregnancy and STDs items), with males reporting these items came to mind more frequently. The lack of any mood effects and any interactions with prior BI/BE is inconsistent with the expected findings (Hypotheses 1 and 2).

For the negative importance endorsement, there was again an effect for gender, but also a marginal mood (D1) by condition main effect ($\beta = -.22$, $t = -1.62$, $p = .108$). This effect suggests that those in the happy mood condition with high BI/BE were less likely to report negative outcomes as being important. To look more carefully into this interaction, regressions were run using the factors as the dependent variables. For the factor two (pregnancy and STDs) regression, only D1 was significant ($\beta = -.24$, $t = -2.01$, $p < .05$)—those in the happy mood were less likely to view pregnancy and STDs as being important to them than those in the neutral mood condition. However, both males and females rated these outcomes as being equally important. For the regression predicting factor 1 (everything except pregnancy and STDs), the gender effect was significant ($p < .001$) and there was a marginally significant D1 x BI/BE interaction ($\beta = -.25$, $t = -1.93$, $p = .057$). For these six

Table 8 *Regressing Negative Outcome Expectancy DVS on Predictors*

	Gender	Baseline RT	Mood D1	Mood D2	MT BI/BE	MT BI/BE x D1	MT BI/BE x D2
Come to Mind	-.29**						
Come to Mind Factor 1	-.37***						
Come to Mind Factor 2	-.27**						
Come to Mind Factor 3	.22*						
Important	-.30***					-.22^{+}	
Important Factor 1	-.35***					-.25^{+}	
Important Factor 2			-.24*				
RT Read Expectancy	.20*	.55***				-.23^{+}	
RT Come to Mind		.35***		.25*			
RT Important		.29**		.30**			-.26^{+}

Note: Table shows βs. * $p < .05$, ** $p < .01$, *** $p < .001$, $^{+}$ $p < .11$. Gender: 0 = Female, 1 = Male; D1: 1 = Happy, 0 = Sad, Neutral; D2: 1 = Sad, 0 = Happy, Neutral

negative outcome expectancies, females rated them as being more important than males and those in the happy mood condition with higher BI/BE rated them as being less important. These results are inconsistent with Hypothesis 1b, which predicted that there would be no difference in endorsement of the negative outcome expectancies based on mood. Also, it was predicted that any mood effects would be stronger for those with lower levels of prior BI/BE

(Hypotheses 2)—this was not the case. In contrast, it was those participants who already had high levels of BI/BE who were influenced by being in a happy mood.

Reaction times. Mood effects were found in every reaction time regression related to negative outcome expectancies. First, the time it took to initially read the outcome expectancy and click "next" was predicted. There were significant effects for baseline reaction time and gender (those with faster baseline times, or were female, were faster at reading the negative outcome expectancy). There was also an interaction between D1 x BI/BE, though it failed to reach significance (β= -.23, t = -1.92, p = .057). The pattern was that reading times were faster for those higher in BI/BE who were in the happy mood condition. Note that before it was found that this same group also reported six of the negative outcomes (factor 1) as being less important to them. This suggests that those in the happy mood, to some extent, were more dismissive of the negative outcomes. This is consistent with the idea that this group should be the most interested in maintaining their current (happy) mood state. A second regression was done predicting the time it took participants to read the outcome expectancy and respond to the "come to mind" question. Again, those with faster baseline times were quicker to respond to these items. In addition, there was a significant effect of D2 (β = 0.25, t = 2.28, p = .03). In this case, those in the sad mood condition spent more time responding than those in the other conditions. Finally, the time it took participants to read and respond to the importance question was examined. Baseline response time was again a significant predictor. In addition, there was a significant main effect for D2 (β = 0.30, t = 2.70, p = .008) and a marginal D2 x BI/BE interaction (β = -0.26, t = -1.74, p = .085). The main effect shows that, as with the "come to mind" question, those in the sad mood condition took longer to read and respond to the measure of importance for

the negative outcome expectancies. The marginal interaction suggests that this effect was slightly stronger for those higher in BI/BE. The slower time for those in the sad conditions, were not due to any differences in how often participants' responded with "Maybe."

Positive Outcome Expectancies

Endorsements. Parallel regression analyses were done on the positive outcome expectancy measures (see Table 9). Gender was the only significant predictor of whether a positive outcome came to mind, such that males were more likely to have had these positive outcomes come to mind. Overall, the positive expectancies came to mind just as often for the different mood conditions and different BI/BE levels. As an aside, when only factor 2 of "come to mind" (stress relief, distraction, strengthen relationship) was entered as the dependent variable, there was significant effect of prior BI/BE ($\beta = 0.43$, $t = 2.36$, $p = .02$) and a marginal interaction between D1 and BI/BE ($\beta = -.26$, $t = -1.79$, $p = .076$). These positive factors came to mind more often for those with higher BI/BE, though among those high in BI in the happy mood condition there was a tendency for them to be *less* likely to come to mind. With respect to whether or not the positive outcomes were important to them, the two significant predictors were gender and D2 ($\beta = 0.23$, $t = 2.07$, $p = .04$). Thus, males and those in the sad mood conditions were more likely to say that the positive outcomes were important to them. This finding is consistent with Hypothesis 1a, though it is not consistent with Hypothesis 2 (that the effect would be moderated by prior BI/BE). Recall, that a one-factor solution was found for the negative outcome importance measures, so this suggests that the mood effect was similar across the various positive outcome expectancies.

Table 9 *Regressing Positive Outcome Expectancy DVS on Predictors*

	Gender	Baseline RT	Mood D1	Mood D2	MT BI/BE	MT BI/BE x D1	MT BI/BE x D2
Come to Mind	.21*				.31^{+}		
Come to Mind Factor 1	.26**						
Come to Mind Factor 2					.43*	-.26^{+}	
Important	.22*			.23*			
RT Read Expectancy	.23**	.57***					
RT Come to Mind		.43***					
RT Important		.36***					-.25^{+}

Note: Table shows βs. * $p < .05$, ** $p < .01$, *** $p < .001$, $^{+}$ $p < .10$. Gender: 0 = Female, 1 = Male; D1: 1 = Happy, 0 = Sad, Neutral; D2: 1 = Sad, 0 = Happy, Neutral

Reaction times. Baseline response time and gender significantly predicted the amount of time it took for participants to read the positive expectancies and click "next." Males and those with slower baseline response times were slower to read the positive outcome expectancies. There were no significant effects for either mood or BI/BE. Likewise, the only significant predictor of the reaction time for "come to mind" was baseline reaction time. Finally, baseline reaction time was also a significant predictor of the time it took to respond to the importance measure. In addition, though, there was a marginally significant interaction, D2 x BI/BE (β = -.25, t = -1.70, p = .09). The pattern suggests that those in the sad mood condition and high in BI/BE were faster in responding. In general, however, the

findings with respect to reaction times related to positive outcome expectancies were inconsistent with Hypotheses 1 and 2.

Effects on Other Experimental Measures

Although it was not clear how long the mood manipulation would last (or how mood would be influenced by the outcome expectancies), the experimental BW, BI/BE, PV, and prototype measures, that followed the outcome expectancy measures, were regressed on gender, mood, BI/BE, and the Mood x BI/BE interaction terms. The willingness items came immediately after the expectancy items and were therefore expected to be more likely to show an effect of mood. When controlling for mass-testing BW, there was a significant effect of D1 ($\beta = .18$, $t = 2.09$, $p = .04$). In addition, gender and mass-testing BW were significant predictors. The mood effect showed that those in the happy mood condition reported higher BW, which is opposite to what was expected. It is interesting to note that when mass-testing BW was not controlled for in the model, D2 became marginally significant such that those in the *sad* mood condition reported higher BW (which would be consistent with the expected findings).

The experimental BI/BE measure also showed significant mood effects. In this case, the two interactions were significant, D1 x BI/BE ($\beta = 0.25$, $t = 1.98$, $p = .05$); D2 x BI/BE $\beta = 0.30$, $t = 2.24$, $p < .03$). The first interaction shows that the experimental BI/BE was higher for those in the happy condition who had higher prior levels of BI/BE; the latter interaction shows that those with higher levels of prior BI/BE in the sad condition also had higher experimental BI/BE. Thus, it appears that higher levels of prior BI/BE were related to more experimental BI/BE, except for those in the neutral mood condition. As BI/BE is typically positively correlated with BW, it was expected that sad mood may predict higher BI/BE; in

addition, previous correlational research (Pomery, 2008a) has shown that happy moods are related to higher sex BE. Therefore, the current findings are not completely unexpected. A Mood Condition x Prior BI/BE x Measure repeated-measures ANOVA was run on experimental BW and BI/BE to see how similar the effects were for the two measures. With respect to within-participant effects, the following were significant: measure, Measure x Gender, and Measure x Prior BI/BE (all *p*s < .008). Experimental BW was higher than experimental BI/BE, and this difference was stronger for males than for females (as females tended to be low on both). Not surprisingly, the difference in experimental BI/BE (low prior BI/BE *M* = 1.94, high prior BI/BE *M* = 2.98) between the two groups was larger than the difference in the experimental BW measure (*M*s = 4.38 and 4.68, respectively). In addition, gender, condition, and prior BI/BE all showed significant main effects (*p*s $\leq$ .05). Males, those in the sad condition, and/or those with higher prior levels of BI/BE reported higher scores on the combined experimental measures (BW and BI/BE). This significant mood effect is consistent with predictions, in that it was those in the sad mood condition that reported the riskier health cognitions. In addition, the Condition x Prior BI/BE was marginally significant (*p* = .108): for those in the happy and sad condition, those with higher prior BI/BE reported higher experimental BW and BI/BE (happy *M* = 3.93, sad *M* = 4.17) compared to those in the neutral condition (*M* = 3.40); for those with lower levels of prior BI/BE, those in the sad condition reported the lowest scores (*M* = 2.89) followed by those in the neutral condition (*M* = 3.21) and those in the happy condition reported the highest experimental cognitions (*M* = 3.38).

With respect to the other experimental cognition measures, PV and prototype favorability, regression analyses found that gender was the only predictor (significantly so

for prototype, marginally so for PV). Males were likely to report higher prototype favorability ratings and lower PV than females. These gender effects were expected. There were no mood effects, possibly suggesting that the mood manipulation had worn off by the time participants reached these measures. As PV and prototype were not measured in each mass-testing session, it was not possible to control for prior levels of these two cognitions. It is possible that after controlling for prior levels, mood may have explained a significant part of the unexplained variance that was left over.

DISCUSSION

Overview of Hypotheses and Primary Findings

Hypotheses. The goal of the study was to examine the influence of a positive, negative, and neutral affective state on endorsement of and response time to positive and negative outcome expectancies. In addition, the influence of these affective states on willingness, intentions, perceived vulnerability, and prototype favorability was also investigated. It was hypothesized that those in the negative mood condition would more strongly endorse the positive outcome expectancies, as they would be motivated to improve their current mood state. In contrast, participants in the happy mood condition were expected to have lower levels of endorsement for the positive outcome expectancies, although they may be attracted to the like-valenced items and spend longer time reading them (Bower, 1981; Dalgliesh, 2003). In addition, it was hypothesized that the effects of the induced mood states would be moderated by prior level of BW and BI, with those "at risk" (high BW/low BI) showing stronger mood effects than those more committed to the risky behavior (high BW/high BI).

Mood effects. Contrary to expectations, no effects of mood were found on the endorsement of outcome expectancies in any of the repeated-measures analyses. As the mood induction was successful, it is unlikely that a problem with the induction was an issue. When examining only the negative outcome expectancies, there were significant effects of mood on the "Would this be important to you?" item, though not as predicted. The negative outcome expectancies received the highest importance ratings from those who were in the happy mood condition and were higher in mass-testing BI/BE (a potential explanation for this finding is described later). There were few effects of mood on the positive outcome expectancy items.

With respect to the response time measures, some interesting findings emerged, as there were either significant or marginal effects found for the three negative reaction time measures and one for the positive outcome expectancy reaction time measures (importance). Those in the happy mood condition with higher levels of prior BI/BE were quicker at reading the negative outcome expectancies; those in the sad condition took longer to report whether these expectancies either came to mind or were important to them. Those with higher prior BI/BE in the sad mood condition were quicker in responding whether the positive outcome expectancies were important to them. It is interesting to note that mood effects were found more consistently for the importance measure, as this question always followed the "Did this come to mind?" item which was less likely to show any effects of mood.

Comparing groups. Not surprisingly, those in the high BW/high BI group (the "intenders") showed greater endorsement of the positive outcome expectancies and lower endorsement of the negative outcome expectancies. Since they have likely engaged in the behavior in the past, and plan to do so in the future, focusing on the positive consequences

(and less on the negative consequences) facilitates the reduction in any dissonance that may be experienced. Contrary to predictions, however, when interactions were found, it was the high BW/high BI group that showed the stronger mood effects ("the intenders").

Reconciling Findings with the Mood Literature

The hypotheses were based on previous findings that people in negative mood states tend to act in a more risk-taking manner than those in happy mood states, as explained by the motivation mood theories. However, as noted in the introduction, the literature has also consistently found that those in sad moods tend to think more systematically and more in-depth than those in happier mood states who have been found to use shallower levels of processing and be more likely to use simple heuristics in their decision-making. It is risky to make conclusions about level of processing from the reaction time findings, however there is at least some evidence from the current study to support these findings. For example, those in the sad mood condition took longer to report on whether the negative outcome expectancies either came to mind or were important to them. This suggests that those in the sad mood condition may have been thinking more in-depth than those in the happy condition. It did not appear that those in the sad mood condition were just more indecisive, in that they were no more likely to respond with a "Maybe" than the other mood conditions. The faster times of those in the happy mood condition lends support for the idea that the negative outcome expectancies were being processed in a shallower manner by this group (at least for those with higher levels of mass-testing BI/BW).

The influence of mood states on risky sexual cognitions and outcome expectancies are also likely influenced by the type of behavior. The scenario and measures in the study were specific to casual partners. It is likely that the effects of mood on sexual cognitions and

behavior differ when considering sex with a steady partner. Gender differences and the role of past behavior also come into play when comparing sexual behavior with casual vs. steady partners. Future research should examine these issues in more detail.

Reconciling Findings with PWM

As before (e.g., Pomery, 2004), mood was shown to influence risk cognitions (specifically, BW and to a slightly lesser extent, BI/BE). It is the case that these cognitions, especially BW, are more labile for the "at-risk non-intenders," however, this is not necessarily inconsistent with our findings with respect to outcome expectancy endorsements. These individuals, in theory, are more influenced by elements of the social reaction path and contextual factors. Outcome expectancies, on the other hand, are often considered part of the reasoned pathway that is common in expectancy-value theories; in making a rational decision, it is logical that one would consider the potential consequences of one's actions. It may be the case that mood does not have a strong effect on more reasoned or logical decision-making, but rather on the more experiential, heuristic, and less analytic processing style described in dual-process theories (e.g., Chaiken & Trope, 1999). That is to say, rather than influencing any of the factors that are influential in more rational decision-making, mood states may affect people's gut reactions to decisions.

In addition to being "at-risk," it is also possible to conceive that those in the high BW/low BI group were ambivalent toward the behavior. They likely held both favorable and unfavorable attitudes regarding casual sex. The high BW/high BI group can be conceptualized as those who hold stronger, and more favorable, opinions of the behavior. Research has shown that those with stronger attitudes are more likely to prefer attitude-

consistent information (Brannon, Tagler, & Eagly, 2007). The role of attitude ambivalence and selective exposure among these groups should be further explored in future research.

The Role of Dissonance

It was found that, in general, those in the high BW/high BI group more strongly endorsed the positive outcome expectancies and less strongly endorsed the negative outcome expectancies than those in the high BW/low BI group. In retrospect, this is not surprising given the potential cognitive dissonance that may have been experienced by this group. The high BW/high BI group is, in theory, more committed to engaging in the behavior; however, they realize the negative implications of doing so (as shown by the fact that the negative outcome expectancies were equally likely to come to mind for this group as the high BW/low BI group). The circumstances are such that this group is particularly likely to experience dissonance: they are committed to the behavior, they are aware of the potential negative consequences, and they were not forced into any of their prior actions or decisions (Petty & Cacioppo, 1996). As a result, the high BW/high BI group needs a way to reduce this cognitive tension. One of the classic ways of doing so is through changing cognitions (Festinger & Carlsmith, 1959). By increasing the importance of positive outcomes, they are adding consonant cognitions, adding support for why they are committed to the risky behavior. By minimizing the importance of the negative outcomes, they are also able to decrease dissonance. All participants were exposed to both positive and negative outcome expectancies. They were not able to select which ones they read or responded to. However, the amount of time they spent doing this was not set by the experimenter. Although by no means was it a consistent pattern, there were occasions when the times were quicker for the

negative outcome expectancies for those higher in mass-testing BI. This group may have been answering more quickly in an attempt to dismiss the potential risks.

Alternatively, there is also a non-dissonance explanation for these findings: specifically, those in the high BW/high BI group may have been acting in accordance with their past attitudes and beliefs. For example, rather than increasing the importance rating of positive outcome expectancies because of dissonance caused by the awareness of their past behavior, they may have simply held these beliefs prior to engaging in any risky behavior. It should be noted that these two explanations (behavior influencing changes in attitude and attitudes influencing future behavior) are not mutually exclusive, however. Future studies should investigate these effects further.

Implications

Although not a focus of the study, there were interesting findings with respect to the factor structures of the outcome expectancy endorsement items. For example, the structures differed for the "come to mind" and "importance" items. In addition, worries about contracting STDs or of a possible pregnancy were related (and both were commonly endorsed, both in terms of frequency of coming to mind and in importance to the participants). In one case, the factor containing these two items was positively correlated with the experimental BW index—opposite to both expectations and the pattern shown by the other negative outcome expectancy factors, which were inversely related to BW. STDs and pregnancies are the more common negative outcomes that are stressed by public health officials and sex educators, and in advertisements for condoms and other types of birth control. It may be that participants thought this was what they were expected to think about when given the scenario. In any case, these items were highly endorsed, even by those who

reported higher levels of BW. This is disconcerting in the fact that even though these young adults thought about and realized the importance of these negative outcomes, it did not lower their willingness to engage in risky sexual behavior. This adds support for the consistent finding that education alone is not an effective prevention tool.

Advantages and Limitations of Study

This study was unique in that all affective states were experimentally induced (including neutral mood). In addition, it is the first study to examine potential mediators of the affective states → BW relation (in this case, positive and negative expectations). To avoid having participants bias their own results by self-correcting for their perceived influence of mood, as explained by the Flexible Correction Model, Wegener & Petty, 2001), the general purpose of the study was disguised. Finally, the pre-testing during mass-testing sessions allowed for participants to be selected based on their prior levels of BW and BI/BE. Therefore, it was possible to compare different groups, namely the high BW/low BI group and the high BW/high BI group.

Although the study had many advantageous aspects, there are also some limitations that are worthy of discussion. First, the small sample size did not allow for much statistical power in testing for the hypothesized effects. Combined with the fact that the effect sizes were smaller than anticipated, it made it harder to detect hypothesized effects, especially interactions. Due to the lower rate of accrual during Spring 2008, participants who had taken part in other mass-testing sessions (Fall 2007 mass-testing, Spring 2008 scale validation, and Summer 2008 mass-testing) eventually were also recruited. This was not ideal in that there was a large discrepancy in the amount of time that had passed since participants had completed the mass-testing measures. In addition, the mass-testing sessions from which their

prior BW, BI/BE and behavior were assessed, did not include all of the items assessed during the Spring 2008 mass-testing session. For example, during the Fall 2007 mass-testing session, there were only two BI/BE items—both related to casual sex, but neither mentioned that a condom was not available. There were also differences in the BW measures assessed. For Fall 2007, there was only one BW scenario and it made no mention of whether or not a condom was available. In addition, the question assessing how often participants typically had a condom with them when they attend parties or go to a bar was not assessed and could not be controlled for. In an effort to deal with this issue, BW and BI/BE items were standardized within their specific mass-testing cohort and then averaged to form the mass-testing indices for both BW and BI/BE.

The lack of identical pre-testing measures for each participant makes it more difficult to assess their BW and BI/BE and determine whether they should be classified as either high BW/low BI or high BW/high BI. Thus, there is likely a larger amount of variation among the two groups than would be desired, and as a result some participants may have been misclassified. Ideally, the criteria for recruitment would have been identical for each participant, which would lessen the likelihood of any classification issues. When pre-selecting groups based on high or low BI/BE scores in mass-testing, regression to the mean is a concern during the experimental session. It may be that participants' true BI/BE scores are closer to the group mean, and thus those selected with higher BI/BE scores in mass-testing may report lower scores during the mass-testing session (and those with lower BI/BE scores in mass-testing may report higher scores during the experiment). This narrowing of the difference in BI/BE between the two groups can limit the effect size of group differences, leading to less power in the analyses.

There were also some limitations with the experimental procedure that may have influenced the findings. For example, participants were asked to think about the casual sex BW scenario for 3 minutes before being exposed to the outcome expectancy statements and questions. Some participants reported that this was too long, as they knew immediately what they would do, based on previous experience in similar situation. It is hard to know what the ideal time is, as participants should have enough time to think carefully about the scenario, but not to the extent where they become distracted or bored. It is likely that the ideal amount of time varies from participant to participant, based on factors such as need for cognition. A small number of participants reported that they were confused by what was meant by "casual sex" (one reported that at first he thought it meant having intercourse with one's serious partner, but in a casual manner). Thus, the phrase should have been repeatedly defined throughout the experiment.

An additional issue with the experiment was that mood was only assessed once (following the guided imagery mood induction). Although assessing mood at different times during the experimental session would have allowed for change in mood to be examined, inclusion of additional mood measures would have created additional problems. For example, if mood was measured following the expectancy items, it may have influenced participants' BW and it also would not be clear if any change of mood is a result of the positive or negative outcome expectancies (or both). If mood was measured following the BW scenario, it would be unclear whether mood changed as a result of either exposure to the positive or negative outcome expectancies or to the BW measures. Therefore, the decision was made to only include one mood assessment.

As with other laboratory studies, the external validity of the findings may be questioned. In daily life, when faced with a tempting situation such as the casual sex scenario described, it is unlikely that young adults take 3 minutes to think about what they are going to do. Also, as noted earlier, the participants may not represent the ideal "intenders" or "at-risk non-intenders' (high BW/high BI or high BW/low BI), due to issues with the mass-testing measures. This also limits the ability to generalize the findings.

Future Directions

Many of the limitations addressed earlier should be able to be addressed with future research. For example, larger samples can be used where identical selection criteria are applied. One way to potentially limit the issues surrounding multiple mood measurements would be to use implicit mood measures (Philippot, 1993). Although these tend to be less reliable than self-report items, it would avoid having participants' awareness of their current affective state influencing their responses to later measures.

In order to better examine the role of outcome expectancies, and more generally type of processing, in the mood – BW association, it would be useful to experimentally manipulate these items and examine the impact these manipulations have on the effects of mood on BW. For example, participants could be instructed beforehand to focus on either the positive or negative outcome expectancies; alternatively, participants could be instructed to think about it carefully (inducing a more reasoned processing style) or to go with their gut reaction (inducing a more experiential processing style). The influence that happy and sad mood states have on BW could then be examined across conditions. It has been suggested that the best way to investigate mediational constructs is to treat them as moderators in an experimental design (Frazier, Tix, & Barron, 2004).

With a larger sample, the additional power would allow for testing of moderating variables, such as need for cognition and gender. It may be that the hypothesized effects are true for only a portion of the sample. Also, additional mediators of the affect → BW relation should be examined. It may be the case that mood influences individuals' BW in a less intuitive manner. As previous PWM studies have shown, the social reaction pathway in the model is known for its lack of rational thinking. It may be that mood does not influence the components of logical decision-making (e.g., perceived consequences). In any case, replication of the current study should lead to more definitive conclusions and better identify avenues for future research that can be used to inform prevention programs aimed at adolescents and young adults.

FOOTNOTES

[1] Behavioral expectations assesses how *likely* one is to engage in a behavior (i.e., do you expect to engage in a behavior in a certain time frame; Warshaw & Davis, 1985). Although related, one may expect to engage in a behavior but not plan or intend to do it (e.g., exceed the speed limit, prevaricate; Pomery et al., 2008).

[2] Originally, it was planned that only one mass-testing session would be sufficient to recruit the sample for the current study. In order to increase the sample size, participants were recruited from other sessions. As a result some of the measures varied slightly across mass-testing sessions.

[3] The primary analyses were repeated using only male participants ($N = 78$), and the general pattern of findings remained consistent. For example, with the "come to mind" measure, valence remained significant ($p < .000$) and the Valence x MT BI/BE interaction became significant (from $p = .097$ to $p = .03$). Again, negative outcome expectancies were more likely to come to mind than positive outcome expectancies; participants with higher Mt BI/BE were more likely than those with low MT BI/BE to have positive outcome expectancies come to mind (and slightly less likely to have negative outcome expectancies come to mind). A similar pattern was found with the "important" measure, as there were significant valence and Valence x MT BI/BE effects ($ps \leq .005$); the effect of mood condition remained marginal ($p = .07$), and Valence x Mood condition became marginal ($p = .08$; those in the sad mood were more likely to rate the positive outcome expectancies as being important compared to the other two mood conditions; there was no difference across conditions for the negative outcome expectancies). Thus, there is some suggestion that the effects of the mood induction on endorsements strengthens a little when excluding females

from analyses. Excluding females from the analyses of the reading and response times resulted in fewer and less clear-cut changes.

In addition, the repeated-measures ANOVAS were also conducted using gender as a factor and not as a control variable. The pattern of findings was similar for the two endorsement measures. For the reaction time measures, some new interaction effects emerged. For example, there was a significant Gender x Mood condition x MT BI/BE interaction for the time it took to read each outcome expectancy (p = .04), and a Gender x Condition (p = .05) interaction for time to respond to the "come to mind" measure. The 3-way interaction is difficult to interpret; the Gender x Condition effect is such that males took longer to respond in the sad mood condition compared to the other two mood conditions, whereas females took longer to respond in the happy mood condition compared to the other two mood conditions. However, with as few as 3 participants per cell, drawing conclusions from these analyses is not advisable.

REFERENCES

Ajzen, I. (1988). *Attitudes, personality, and behavior*. Chicago: Dorsey Press

Arkes, H. R., Herren, L. T., Isen, A. M. (1988). The role of potential loss in the influence of affect on risk-taking behavior. *Organizational Behavior and Human Decision Processes, 42*, 181-193.

Armitage, C. J., Conner, M., & Norman, P. (1999). Differential effects of mood on information processing: Evidence from the theories of reasoned action and planned behaviour. *European Journal of Social Psychology, 29*, 419-433.

Auerbach, R. P., Abela, J. R. Z., & Ho, M-H R. (2007). Responding to symptoms of depression and anxiety: Emotion regulation, neuroticism, and engagement in risky behaviors. *Behaviour Research and Therapy, 45*, 2182-2191.

Balch, W. R., Myers, D. M., & Papotto, C. (1999). Dimensions of mood in modd-dependent memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 25*, 70-83.

Baumeister, R. F, & Scher, S. J. (1988). Self-defeating behavior patterns among normal individuals: Review and analysis of common self-destructive tendencies. *Psychological Bulletin, 104*, 3-22.

Bechara, A., Damasio, A. R., Damasio, H., & Anderson, S. W. (1994). Insensitivity to future consequences following damage to human prefrontal cortex. *Cognition, 50*, 7-15.

Bless, H. (2001). Mood and the use of general knowledge structures. In L. L. Martin & G. L. Clore (Eds.), *Theories of mood and cognition: A user's guidebook* (pp. 9-26). Mahwah, NJ: Erlbaum.

Bower, G. H. (1981). Mood and memory. *American Psychologist, 36*, 129-148.

Brannon, L. A., Tagler, M. J., & Eagly, A. H. (2007). The moderating role of attitude strength in selective exposure to information. *Journal of Experimental Social Psychology, 43*, 611-617.

Brown, L. K., Tolou-Shams, M., Lescano, C., Houck, C., Zeldman, J., Pugatch, D., Lourie, K. J., & Project SHIELD Study Group. (2006). Depressive symptoms as a predictor of sexual risk among African American adolescents and young adults. *Journal of Adolescent Health, 39*, 444.e1-444.e8.

Chaiken, S., & Trope, Y. (1999). *Dual-process theories in social psychology*. New York: Guilford Press.

Chou, K-L., Lee, T. M. C., & Ho, A. H. Y. (2007). Does mood state change risk taking tendency in older adults? *Personality and Aging, 22*, 310-318.

Chuang, S-C., & Chang, C-L. (2007). The effects of mood and openness-to-feeling trait on choice. *Social Behavior and Personality, 35*, 351-358.

Cialdini, R. B., Darby, B. L., & Vincent, J. E. (1973). Transgression and altruism: A case for hedonism. *Journal of Experimental Social Psychology, 9*, 502-516.

Clark, L., Iversen, S. D., & Goodwin, G. M. (2001). The influence of positive and negative mood states on risk taking, verbal fluency, and salivary cortisol. *Journal of Affective Disorders, 63*, 197-187.

Cooper, M. L., Agocha, V. B., & Sheldon, M. S. (2000). A motivational perspective on risky behaviors: The role of personality and affect regulatory processes. *Journal of Personality, 68*, 1059-1088.

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology, 69*, 990-1005.

Cooper, M. L., Shapiro, C. M., & Powers, A. M. (1998). Motivations for sex and risky sexual behavior among adolescents and young adults: A functional perspective. *Journal of Personality and Social Psychology, 75*, 1528-1558.

Crepaz, N., & Marks, G. (2001). Are negative affective states associated with HIV sexual risk behaviors? A meta-analytic review. *Health Psychology, 20*, 291-299.

Dalgliesh, T. (2003). Information processing approaches to emotion. In R. J. Davidson, K. R. Scherer, H. H. Goldsmith (Eds.), *Handbook of Affective Sciences* (pp. 661-673). London: Oxford University Press.

DeSteno, D. A., & Salovey, P. (1997). The effects of mood on the structure of the self-concept. *Cognition and Emotion, 11*, 351-372.

Eich, E., & Forgas, J. P. (2003). Mood, cognition, and memory. In A. F. Healy & R. W. Proctor (Eds.), *Handbook of psychology: Experimental psychology, vol. 4* (pp. 61-83). New York, NY: John Wiley & Sons, Inc.

Ethier, K. A., Kershaw, T. S., Lewis, J. B., Milan, S., Niccolai, L. M., & Ickovics, J. R. (2006). Self-esteem, emotional distress and sexual behavior among adolescent females: Inter-relationships and temporal effects. *Journal of Adolescent Health, 38*, 268-274.

Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology, 58*, 203-211.

Frazier, P., Tix, A., & Barron, K. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51*, 115-134.

Gasper, K. (2003). When necessity is the mother of invention: Mood and problem solving. *Journal of Experimental Social Psychology, 39*, 248-262.

Gerrard, M., Gibbons, F.X., & Gano, M. (2003). Adolescents' risk perceptions and behavioral willingness: Implications for intervention. In D. Romer (Ed.), *Reducing Adolescent Risk: Toward an Integrated Approach* (pp. 75-81). Newbury, CA: Sage Publications.

Gerrard, M., Gibbons, F.X., Houlihan, A.E., Wills, T.A., Stoolmiller, M., Yeh, H-C., Brody, G., & Weng. C-Y. (2008). *Temperament, self-control, and dual processing: A test of two pathways to adolescent risk-taking*. Manuscript under review

Gerrard, M., Gibbons, F.X., Reis-Bergan, M., Trudeau, L., Vande Lune, L.S., & Buunk, B. (2002). Inhibitory effects of drinker and nondrinker prototypes on adolescent alcohol consumption. *Health Psychology, 21*, 601-609.

Gerrards-Hesse, A., Spies, K., & Hesse, F. W. (1994). Experimental inductions of emotional states and their effectiveness: A review. *British Journal of Psychology, 85*, 55-78.

Gibbons, F. X., Etcheverry, P. E., Stock, M. L., & Gerrard, M. (2008). *What mediates the effects of discrimination on substance use?* Manuscript in preparation.

Gibbons, F. X., & Gerrard, M. (1995). Predicting young adults' health-risk behavior. *Journal of Personality and Social Psychology, 69*, 505-517.

Gibbons, F. X., & Gerrard, M. (1997). Health images and their effects on health behavior. In B. P. Buunk & F. X. Gibbons (Eds.), *Health, coping, and well-being: Perspectives*

from social comparison theory (pp.63-94). Mahwah, NJ: Lawrence Erlbaum Associates.

Gibbons, F. X., Gerrard, M., & Lane, D. J. (2003). A social reaction model of adolescent health risk. In J. M. Suls & K. Wallston (Eds.), *Social psychological foundations of health and illness* (pp. 107-136). Oxford, U.K.: Blackwell.

Gibbons, F. X., Gerrard, M., Ouellette, J. A., & Burzette, R. (1998). Cognitive antecedents to adolescent health risk: Discriminating between behavioral intention and behavioral willingness. *Psychology and Health, 13*, 319-339.

Gibbons, F. X., Gerrard, M., Reimer, R. A., & Pomery, E. A. (2006). Unintentional behavior: A subrational approach to health risk. In D. de Ridder & J. de Wit (Eds.), *Self-regulation in Health Behavior* (pp. 45-70). Chichester, UK: John Wiley & Sons, Ltd.

Gibbons, F. X., Gerrard, M., Vande Lune, L.S., Wills, T.A., Brody, G., & Conger, R.D. (2004). Context and cognition: Environmental risk, social influence, and adolescent substance use. *Personality and Social Psychology Bulletin, 31,* 1048-1061.

Goldberg, M. E., & Gorn, G. J. (1987). Happy and sad TV programs—How they affect reactions to commercials. *Journal of Consumer Research, 14*, 387-403.

Handley, I. M., & Lassiter, G. D. (2002). Mood and information processing: When happy and sad look the same. *Motivation and Emotion, 26*, 223-255.

Hirschberger, C., Florian,V., Mikulincer, M, Goldenberg, J.L., & Pyszczynski, T. (2002). Gender differences in the willingness to engage in risky behavior: A terror management perspective. *Death Studies, 26*, 117-141.

Hockey, G. R. J., Maule, A. J., Clough, P. J., & Bdzola, L. (2000). Effects of negative mood states on risk in everyday decision making. *Cognition and Emotion, 14*, 823-855.

Hufford, M. R. (2001). An examination of mood effects on positive alcohol expectancies among undergraduate drinkers. *Cognition and Emotion, 15*, 593-613.

Hussong, A. M. (2007). Predictors of drinking immediacy following daily sadness: An application of survival analysis to experience sampling data. *Addictive Behaviors, 32*, 1054-1065.

Isen, A. M., & Geva, N. (1987). The influence of positive affect on acceptable level of risk: The person with a large canoe has a large worry. *Organizational Behavior and Human Decision Processes, 39*, 145-154.

Isen, A. M., Nygren, T. E., & Ashby, F. G. (1988). Influence of positive affect on the subjective utility of gains and losses: It is just not worth the risk. *Journal of Personality and Social Psychology, 55*, 710-717.

Isen, A. M. & Patrick, R. (1983). The effect of positive feelings on risk taking: When the chips are down. *Organizational Behavior and Human Performance, 31*, 194-202.

Johnson, E. J. & Tversky, A. (1983). Afect, generalization, and the perception of risk. *Journal of Personality and Social Psychology, 45*, 20-31.

Leith, K. P. & Baumeister, R. F. (1996). Why do bad moods increase self-defeating behavior? Emotion, risk taking, and self-regulation. *Journal of Personality and Social Psychology, 71*, 1250-1267.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*, 267-286.

MacDonald, T. K., & Martineau, A. M. (2002). Self-esteem, mood, and intentions to use condoms: When does low self-esteem lead to risky health behaviors? *Journal of Experimental Social Psychology, 38*, 299-306.

Mackie, D. M., & Worth, L. T. (1991). Feeling good, but not thinking straight: The impact of positive mood on persuasion. In J. P. Forgas (Ed.), *Emotion and Social Judgments* (pp.201-219). Elmsford, NY: Pergamon Press.

Martin, L. L. & Clore, G. L. (Eds.). (2001). *Theories of mood and cognition: A user's guidebook*. Mahwah, NJ: Erlbaum.

Martin, L. L., Ward, D. W., Achee, J. W., & Wyer, R. S. (1993). Mood as input: People have to interpret the motivational implications of their moods. *Journal of Personality and Social Psychology, 64*, 317-326.

Mayer, J. D., Allen, J. P., & Beauregard, K. (1995). Mood inductions for four specific moods: A procedure employing guided imagery vignettes with music. *Journal of Mental Imagery, 19*, 133-150.

Measelle, J. R., Stice, E., & Springer, D. W. (2006). A prospective test of the negative affect model of substance abuse: Moderating effects of social support. *Psychology of Addictive Behaviors, 20*, 225-233.

Mittal, V., & Ross, W. T., Jr. (1998). The impact of positive and negative affect and issue framing on issue interpretation and risk taking. *Organizational Behavior and Human Decision Processes, 76*, 298-324.

Niedenthal, P. M., Halberstadt, J. B., Margolin, J., & Innes-Ker, A. H. (2000). Emotional state and the detection of change in facial expression of emotion. *European Journal of Social Psychology, 30*, 211-222.

Nygren, T. E., Isen, A. M., Taylor,, P. J., & Dulin, J. (1996). The influence of positive affect on the decision rule in risk situations: Focus on outcome (and especially avoidance of loss) rather than probability. *Organizational Behavior and Human Decision Processes, 66*, 59-72.

Pacini, R., Muir, F., & Epstein, S. (1998). Depressive realism from the perspective of cognitive-experiential self-theory. *Journal of Personality and Social Psychology, 74*, 1056-1068.

Paxton, R. J., Valois, R. F., Watkins, K. W., Huebner, S., & Drane, J. W. (2007). Associations between depressed mood and clusters of health risk behaviors. *American Journal of Health Behavior, 31*, 272-283.

Petty, R. E., & Cacioppo, J. T. (1996). *Attitudes and persuasion: Classic and contemporary approaches*. Boulder, CO: Westview Press.

Pham, M. T. (2007). Emotion and rationality: A critical review and interpretation of empirical evidence. *Review of General Psychology, 11*, 155-178.

Philippot, P. (1993). Inducing and assessing differentiated emotion-feeling states in the laboratory. *Cognition and Emotion, 7*, 171-193.

Pomery, E. A. (2004). *The influence of positive and negative affect on willingness and intentions to engage in risky health behaviors*. Unpublished M. S. thesis, Iowa State University, Ames, Iowa, U.S.

Pomery, E. A. (2008a). *Correlational study of affective states and sex BW and BI*. Unpublished data.

Pomery, E. A. (2008b). *Influence of mood on sex behavior*. Unpublished data.

Pomery, E. A., Gibbons, F. X., Reis-Bergan , M., & Gerrard, M. (2008). *From willingness to intention: Experience moderates the shift from reactive to reasoned behavior*. Manuscript in preparation.

Salovey, P., & Birnbaum, D. (1989). Influence of mood on health-relevant cognitions. *Journal of Personality and Social Psychology, 57*, 539-551.

Salovey, P., Detweiler, J. B., Steward, W. T., & Bedell, B. T. (2001). Affect and health-relevant cognition. In J. P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 344-368). Mahwah, NJ: Lawrence Erlbaum Associates.

Shiffman, S., Balabanis, M. H., Gwaltney, C. J., Paty, J. A., Guys, M., Kassel, J. D., Hickcox, M., & Paton, S. M. (2007). Prediction of lapse from associations between smoking and situational antecedents assess by ecological momentary assessment. *Drug and Alcohol Dependence, 91*, 159-168.

Schwarz, N., Bless, H., & Bohner, G. (1991). Mood and persuasion: Affective states influence the processing of persuasive communications. *Advances in Experimental Social Psychology, 24*, 161-199.

Schwartz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology, 45*, 513-523.

Slovic, P., Finucane, M., Peters, E., & McGregor, D. G. (2002). The affect heuristic. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 397-420). New York: Cambridge University Press.

Sterk, C. E., Theall, K. P., & Elifson, K. W. (2006). The impact of emotional distress on HIV risk reduction among women. *Substance Use & Misuse, 41*, 157-173.

Suhr, J. A., & Tsanadis, J. (2007). Affect and personality correlates of the Iowa Gambling Task. *Personality and Individual Differences, 43*, 27-36.

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional distress regulation takes precedence over impulse control: If you feel bad, do it! *Journal of Personality and Social Psychology, 80*, 53-67.

Verdejo-Garcia, A., Bechara, A., Recknor, E. C., & Perez-Garcia, M. (2007). Negative emotion-driven impulsivity predicts substance dependence problems. *Drug and Alcohol Dependence, 91*, 213-219.

Walch, S. E., & Rudolph, S. M. (2006). Negative affect and risk for human immunodeficiency virus: One size may not fit all. *American Journal of Health Promotion, 20*, 324-333.

Wang, X. T. (2006). Emotions within reason: Resolving conflicts in risk preference. *Cognition and Emotion, 20*, 1132-1152.

Warshaw, P.R. & Davis, F.D. (1985). Disentangling behavioral intention and behavioral expectation. *Journal of Experimental Social Psychology, 21*, 213-228.

Wegener, D. T. & Petty, R. E. (1994). Mood management across affective states: The hedonic contingency hypothesis. *Journal of Personality and Social Psychology, 66*, 1034-1048.

Wegener, D. T., & Petty, R. E. (2001). Understanding effects of mood through the elaboration likelihood and flexible correction models. In L. L. Martin & G. L. Clore (Eds.), *Theories of mood and cognition: A user's guidebook* (pp. 177-210). Mahwah, NJ: Erlbaum.

Wegener, D. T., Petty, R. E., & Smith, S. M. (1995). Positive mood can increase or decrease message scrutiny: The hedonic contingency view of mood and message processing. *Journal of Personality and Social Psychology, 69*, 5-15.

Westermann, R., Spies, K., Stahl, G., & Hesse, F. W. (1996). Relative effectiveness and validity of mood induction procedures: A meta-analysis. *European Journal of Social Psychology, 26*, 537-580.

Williams, S., Zainuba, M., & Jackson, R. (2003). Affective influences on risk perceptions and risk intention. *Journal of Managerial Psychology, 18*, 126-137.

Yuen, K. S. L., & Lee, T. M. C. (2003). Could mood state affect risk-taking decisions? *Journal of Affective Disorders, 75*, 11-18.

APPENDIX A

Mass-Testing Items

For all questions, casual sex defined as sex with someone you don't know very well

Note: MT = Mass-testing, SV = Scale Validation

Behavioral Willingness

Spring 2008 MT, Spring 2008 SV, Summer 2008 MT

Suppose you were at a party and met a man/woman for the first time. You think that he/she is attractive, and the two of you get along very well. At the end of the evening, you go to his/her apartment with him/her. You're feeling as if you might like to have sex with him/her and he/she obviously feels the same way. Neither of you has a condom. How willing would you be to do each of the following: (1 = *not at all willing*, 4 = *maybe*, 7 = *very willing*)

1. Stay at his/her apartment and have oral sex.
2. Stay at his/her apartment and have sex.
3. Stay at his apartment, but don't have sex. (*throwaway item*)

Fall 2007 MT, Spring 2008 MT, Summer 2008 MT

Suppose you were at a party and met a man/woman for the first time. You think that he/she is attractive, and the two of you get along very well. At the end of the evening, you go to his/her apartment with him/her. You're feeling as if you might like to have sex with him/her and he/she obviously feels the same way. How willing would you be to do each of the following: (1 = *not at all willing*, 4 = *maybe*, 7 = *very willing*)

4. Stay at his/her apartment and have oral sex.
5. Stay at his/her apartment and have sex.
6. Stay at his apartment, but don't have sex. (*throwaway item*)

Behavioral Intentions/Expectations

1. In the next 6 months, do you intend to have casual sex? (1 = *definitely not*, 4 = *maybe*, 7 = *definitely*)—Fall 2007 MT, Spring 2008 MT, Spring 2008 SV, Summer 2008 SV
2. In the next 6 months how likely is it that you will have casual sex? (1 = *not at all likely*, 4 = *maybe*, 7 = *very likely*).—Fall 2007 MT, Spring 2008 MT, Summer MT
3. In the next 6 months, do you intend to have sex without a condom? (1 = *definitely not*, 4 = *maybe*, 7 = *definitely*)—Spring 2008 MT, Spring 2008 SV, Summer 2008 MT
4. In the next 6 months, do you intend to have casual sex without a condom? (1 = *definitely not*, 4 = *maybe*, 7 = *definitely*)—Spring 2008 MT, Spring 2008 SV

Past Behavior

1. How many people have you had sexual intercourse with in your lifetime? (1 = *none*, 2 = *1*, 3 = *2*, 4 = *3*, 5 = *4*, 6 = *5*, 7 = *6-7*, 8 = *8-9*, 9 = *10-11*, 10 =*12 or more*)—Fall 2007 MT, Spring 2008 MT, Spring 2008 SV, Summer 2008 MT

APPENDIX B

Experimental Risk Cognition Measures

Behavioral Willingness

Suppose you were single and not seriously dating anyone. You've had your eye on someone in one of your classes. He/she invites you to a party at his/her apartment, and you accept. During the party you quickly become engrossed in conversation, and immediately feel a connection with this person. It is obvious that you are both attracted to each other. The party is winding down, and eventually everyone leaves. You continue to talk with this person. Neither of you has a condom. How willing would you be to do each of the following: (1 = *not at all willing*, 4 = *maybe*, 7 = *very willing*)

1. Stay at his/her apartment and have oral sex.
2. Stay at his/her apartment and have sex.
3. Stay at his apartment, but don't have sex. (throwaway item)

Suppose you were single and not seriously dating anyone. Your roommate is going out with his/her girl/boyfriend, and asks you to come along, as his/her roommate is tagging along. You don't know this person very well, but decide to join them anyway. During the group outing, you and the other roommate hit if off and have an immediate connection. Your roommate and his/her date eventually leave for a party, and you end up alone at your place with this person. You continue to talk, and the topics become more personal. Neither of you has a condom. How willing would you be to do each of the following: (1 = *not at all willing*, 4 = *maybe*, 7 = *very willing*)

1. Have oral sex.
2. Have sex.
3. Continue talking, but don't have sex. (throwaway item)

Perceived Vulnerability

1. If you were to have casual sex, without a condom, how vulnerable do you think you would be to the negative consequences of casual sex (e.g., sexually transmitted disease)? (1 = *Not at all*, 4 = *somewhat*, 7 = *very much*)
2. How risky (or dangerous) do you think it is to have casual sex without a condom? (1 = *Not at all*, 4 = *somewhat*, 7 = *very much*)

Behavioral Intentions/Expectations

1. In the next 6 months, do you intend to have casual sex? (1 = *definitely not*, 4 = *maybe*, 7 = *definitely*)
2. In the next 6 months how likely is it that you will have casual sex? (1 = *not at all likely*, 4 = *maybe*, 7 = *very likely*).

3. In the next 6 months, do you intend to have sex without a condom? (1 = *definitely not*, 4 = *maybe*, 7 = *definitely*)
4. In the next 6 months, how likely is it that you will have sex without a condom? (1 = *not at all likely*, 4 = *maybe*, 7 = *very likely*).
5. In the next 6 months, do you intend to have casual sex without a condom? (1 = *definitely not*, 4 = *maybe*, 7 = *definitely*)
6. In the next 6 months, how likely is it that you will have sex without a condom? (1 = *not at all likely*, 4 = *maybe*, 7 = *very likely*).

Prototype Image

Now we'd like you to think about the type of person your age who has sex with a "casual" partner, (someone they don't know very well or who they just met), without using a condom. We are not suggesting that these people are always alike. Rather, we are interested in what traits you think this type of person is likely to have (that is, what most people in this group are like).

1. How likely is this type of person to be Smart
2. How likely is this type of person to be Confused
3. How likely is this type of person to be Popular
4. How likely is this type of person to be Immature
5. How likely is this type of person to be "Cool" (sophisticated)
6. How likely is this type of person to be Self-confident
7. How likely is this type of person to be Independent
8. How likely is this type of person to be Careless
9. How likely is this type of person to be Unattractive
10. How likely is this type of person to be Dull (boring)
11. How likely is this type of person to be Considerate
12. How likely is this type of person to be Self-centered

APPENDIX C

Mass-Testing Willingness and Intention/Expectation Items by Session

	Spring 2008 MT (n = 77)	Spring 2008 SV (n = 11)	Summer 2008 MT (n = 2)	Fall 2007 MT (n = 22)
BW items				
Scenario 1 (specifically mentions neither person has a condom)				
BW oral sex	5.25 (1.53)	5.27 (1.49)	2.00 (1.41)	N/A
	0.93 (0.70)	0.78 (0.67)	-0.05 (0.95)	
BW have sex	3.30 (1.78)	2.45 (1.81)	1.00 (0.00)	N/A
	0.52 (0.98)	0.09 (1.11)	-0.47 (0.00)	
Scenario 2 (no mention of condom availability)				
BW oral sex	5.53 (1.29)	N/A	2.00 (1.41)	4.77 (1.60)
	0.90 (0.58)		-0.32 (0.70)	0.51 (0.70)
BW have sex	4.99 (1.69)	N/A	1.50 (0.71)	4.36 (1.68)
	0.82 (0.76)		-0.47 (0.36)	0.50 (0.75)
BI/BE items				
Intend casual sex	3.09 (1.78)	3.27 (2.65)	1.00 (0.00)	2.45 (2.06)
	0.39 (0.97)	0.47 (1.42)	-0.63 (0.00)	0.02 (1.05)
Likely casual sex	2.87 (1.89)	N/A	1.00 (0.00)	2.05 (1.66)
	0.30 (1.03)		-0.56 (0.00)	-0.16 (0.90)
Intend sex without a condom	3.12 (2.29)	3.00 (2.41)	4.00 (4.24)	N/A
	0.33 (1.10)	0.27 (1.20)	0.82 (1.94)	
Intend casual sex without a condom	1.84 (1.55)	1.82 (1.83)	N/A	N/A
	0.29 (1.30)	0.24 (1.56)		

Note. For each pair of rows, the top line refers to the raw *M*s and *SD*s, the bottom rows are the *M*s and *SD*s for the z-scores calculated within their mass-testing group; MT = mass-testing, SV = scale validation; N/A = not applicable (item not measured)

APPENDIX D

Outcome Expectancy Instructions and Items

Prior to Expectancies

Imagine the following situation for the next few minutes…Suppose you were single and not seriously dating anyone. You've had your eye on someone in one of your classes. He/she invites you to a party at his/her apartment, and you accept. During the party you quickly become engrossed in conversation, and immediately feel a connection with this person. It is obvious that you are both attracted to each other. The party is winding down, and eventually everyone leaves. You continue to talk with this person. Neither of you has a condom. Please think about this scenario, and try to imagine yourself in this situation. Think about how you might react. [Screen advances after 3 min.]

Presentation of Expectancies

People give a number of reasons why they would or wouldn't have sex with a casual partner (i.e., someone they don't know very well). Here are some responses that were given in a national poll of sexual behavior given to approximately 6500 young adults ages 20-25. We're interested in your reaction to the reasons they gave. Please read each statement and answer the two questions that follow.

[Note expectancies presented in random order.]

Negative Expectancies

1. I would NOT have sex because…I would feel bad afterwards. It would make me feel cheap or dirty.
2. I would NOT have sex because…It would be hard to establish a "real" relationship with this person in the future. If I like him/her, I'd wait.
3. I would NOT have sex because… I would be afraid of getting a sexually transmitted disease (STD) like herpes, or worse, HIV.
4. I would NOT have sex because…I would feel sinful, as it goes against my personal morals and religious beliefs. I was not raised to act like this.
5. I would NOT have sex because…I don't want the other person to get the impression that I often have sex with someone I've just met.
6. I would NOT have sex because…I don't want to be seen as someone who sleeps around. I'm not that type of person.
7. I would NOT have sex because…I don't like to do things on the spur of the moment. I prefer things to be more planned.
8. I would NOT have sex because…I don't want to get (a girl) pregnant. I'm too young for that kind of responsibility.

Positive expectancies

1. I would have sex because…It would be a great stress reliever. Having sex would help me to relax.
2. I would have sex because…It would help my reputation, and improve my standing among my peers.
3. I would have sex because…It would make me feel good about myself. I'd feel like a better person (boost my self-esteem).
4. I would have sex because…It would make me feel sexy (attractive) to be desired by someone I don't know well.
5. I would have sex because…It would give me pleasure to give my partner an orgasm. I enjoy making my partner happy.
6. I would have sex because…It would strengthen our relationship by increasing the attraction we feel toward each other and cementing the bond we have.
7. I would have sex because…I would greatly enjoy the physical pleasure (e.g., achieving an orgasm).
8. I would have sex because…It would distract me from all the things I was currently worried about (for example, money, studying).

For each outcome expectancy:

a) Did this go through your mind? (*no, maybe, yes*)
b) Would this be important to you? (*not at all*, *somewhat*, *very*)

APPENDIX E

Current Feelings

Think for a minute about how you are feeling right now. Then quickly respond to each item.

Currently, I feel ….

1	2	3	4	5
not at all	a little	moderately	quite a bit	extremely

1. _____ Calm
2. _____ Discouraged
3. _____ Cheerful
4. _____ Discontent
5. _____ Energetic
6. _____ Unhappy
7. _____ Optimistic
8. _____ Secure
9. _____ Unenthusiastic
10. _____ Alert

APPENDIX F

Guided Imagery Scenarios

Happy
Practice: You watch your favorite sports team come from behind to win a big game.
1. You just got a new job, and it's even better than you expected.
2. You spend a day in the mountains: the air is clean and sharp, the day sunny, and you take a swim in a beautiful lake.
3. It's your birthday and friends throw you a terrific surprise party.
4. You get out of class or work early. It's a beautiful day and you and some friends go out for ice cream.
5. You wake up on a Saturday after a number of wintry-cold rainy days, and the temperature is well above average.

Sad
Practice: You watch your favorite sports team blow a big lead and lose a big game.
1. A pet you were really fond of has died.
2. Your best friend just graduated or got married and is moving far away from you.
3. No one remembers your birthday.
4. You get out of class or work late and don't have time to hang out with your friends.
5. You wake up on a Saturday morning and it's a wintry-cold snowy day and you have to cancel events planned with friends.

Neutral
Practice: You listen to the news on the radio in the car.
1. You meet with other students to work on a group project for class.
2. Your cell phone rings between classes.
3. You arrive to an appointment a few minutes early and read a magazine in the waiting room.
4. You quickly skim through your e-mails before heading off to class in the morning.
5. You check the weather report and decide whether or not you will need a coat today.