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Social comparison with risk images

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Social comparison with risk images

by

David John Lane

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:
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For the Major Program

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ABSTRACT

The Prototype/Willingness Model (Gibbons, Gerrard, & Lane, 2003) posits that there are two pathways to predicting health-related risk behavior, one that is sensitive to situational changes (willingness to engage in behavior), and one that is relatively stable (intention to engage in behavior). This model makes two assumptions: 1) that individuals compare themselves to mental representations (or prototypes) of the typical risk-taker, affecting willingness to engage in risk behavior; and 2) because it depends on social comparison, willingness is more easily changed than intention. These assumptions were tested in three studies that looked at perceptions of the prototypical drinker. In Study 1, participants with favorable drinker prototypes reported liking a partner who drank more than those with unfavorable images, whereas the opposite was true for participants who learned about non-drinking partners. Study 2 expanded on Study 1 and found that participants who were similar to a drinking partner reported a positive association between prototype favorability and willingness to drink, whereas those who were dissimilar reported a negative relationship. Similarity was interpreted as indicative of interest in social comparison, so in Study 3 participants were explicitly instructed to socially compare with a drinking partner. Relative to a control group, male participants reported a stronger positive association between prototype favorability and willingness to drink, supporting the contention that social comparison increases the effect of prototypes on willingness to drink. This comparison effect did not occur for participants whose intention to drink was measured, supporting the contention that willingness and intention are separate cognitions about risk behavior.

GENERAL INTRODUCTION

The idea that adolescents' risky behaviors have social causes is so well accepted as to be a truism. When asked, many lay people would point to factors such as peer pressure or the influence of "bad" friends as reasons why young adults drink. This reasoning is supported by research that perceived peer pressure is associated with risky behaviors (Brown, Clasen, & Eicher, 1986). Often, however, this social influence is indirect rather than direct. For example, young adults' perceptions of others' attitudes about risky behavior -- their subjective norms -- have been shown to affect attitudes about drinking. If young adults believe that most of their peers support heavy drinking, their own attitudes and behavior eventually shift to become more supportive of heavy drinking as well (Prentice & Miller, 1993; Marks, Graham, & Hansen, 1992), whereas if they learn that most peers do not support heavy drinking, they will actually report drinking less over time (Schroeder & Prentice, 1998). The importance of norm perceptions suggests that individuals' cognitions about others play as important a role as active social influence in determining risk behavior.

The present research takes a social-cognitive approach to health-related risk behaviors. It takes a cognitive perspective by examining the schemata or mental representations that people have about those who drink, and the role that these schemata play in affecting individuals' willingness to drink. It takes a social perspective by focusing on social comparison as the process whereby social schemata affect willingness to drink. Correlational, prospective research has demonstrated an association between social schemata of drinkers, also known as risk images or prototypes, and subsequent risk behavior (Gibbons & Gerrard, 1995; Gibbons, Gerrard, Blanton, & Russell, 1998; Gerrard, Gibbons, Reis-Bergan, Trudeau, & Vande Lune, 2002). There is only limited evidence, however,

supporting the hypothesized social comparison process through which prototypes influence attitudes about risk. The proposed study will examine the role of social comparison as both a mediator and moderator of the relation between risk images and behavior.

The theoretical framework upon which this research rests (the Prototype/Willingness Model, explained below) is believed to be applicable to a host of health-related risk behaviors. This study will focus exclusively on heavy drinking, however. Alcohol use remains the most common substance used by young adults, as evidenced by a recent finding that two-thirds of high school seniors report being drunk at least once in their lives (Johnston, O'Malley, & Bachman, 2003). Most of the public health problems associated with alcohol use (e.g., fights, sexual assaults) occur from having multiple drinks in a single setting (Valois, McKeown, Garrison, & Vincent, 1995; Abbey, 2002). These statistics highlight the importance of studying antecedents to heavy drinking, such as risk images. There are three areas of research that form the theoretical foundation necessary to understand risk images: research on social schemata, prototype matching, and social comparison. Each area will be briefly summarized here.

Social Schemata

People create mental schemata, or frameworks, to organize and process information about situations, roles, or other people (Niedenthal, Cantor, & Kihlstrom, 1985). Research on the organization of information in memory generally distinguishes between two basic cognitive processes that explain memory storage: exemplars and prototypes.

Exemplars are individual instances coded in memory. A popular example of an exemplar-based model is the multi-trace model by Hintzman (1986). In this model, each individual experience with an object is preserved as a separate memory trace. When people

need to make categorization judgments, they compare the stimulus with individual memory traces. If traces are similar to the stimulus, they are activated in memory. The combination of activated memory traces creates a category called an echo that, if sufficiently intense, allows people to classify the stimulus as a member of that category. Essentially, categorization is performed by comparing new items to a weighted average of all previously encountered similar items. For example, when thinking about the category of college students who drink, individuals would form the category by recalling all previous examples of drinkers they had known.

Prototype theorists, on the other hand, differ from exemplar theorists in that they assume that the category itself is stored in memory, and not just created as needed. Posner and Keele (1968) typify the classic prototype research paradigm. Participants were taught to classify patterns of dots into different groups. Dot patterns were either high or low variability distortions of an original dot pattern, called the prototype, which participants never actually observed. After an initial training, participants were able to classify new dot patterns that were based on the same prototypes. Participants had no direct experience with the prototypes on which dot patterns were based, suggesting they had created and stored in memory their own version of the prototype that was used to categorize these patterns. Posner and Keele argued that similar prototype development occurs when people need to classify more complicated objects, such as groups of people. When individuals think about the typical drinker, they are activating a social category that has certain key features (e.g., college-aged, gets drunk on weeknights, is male).

Although research on prototypes often begins with the assumption that individuals cognitively organize how they think about others into schemata (Fiske, 1995), an exemplar-

based model such as the one proposed by Hintzman has the same end-result as a prototype model: it produces a typical category member. Whether they do so through exemplar- or prototype-based processes, there is ample evidence that people structure information about other people into categories. For example, C.A. Anderson and Sedikides (1991) studied person perception, and concluded that people thought about others in terms of categories of traits that tended to cluster together. Anderson and Sedikides termed this the “typological” approach to person perception, arguing that people think about others as more than just the sum of a series of traits, but rather as a type of person. In the present research, the type or category is represented by the image of the typical person who engages in a certain behavior, such as the typical teen smoker or drinker. It should be noted that in calling a prototype a risk image, it is not meant to imply that the category is primarily visual in nature. Although the drinker prototype may have visual components, the characterological or personality-based components are as or more important (e.g., is the drinker popular? Immature? Smart?).

One early example of research on schemata is a study by Markus (1977), which examined self-schemata, people's mental representations about themselves. Markus presented participants with a series of adjectives and recorded their reaction time to label the adjectives as self-descriptive or not self-descriptive. Participants who had previously scored higher on a self-report survey of dependence identified more dependent words (e.g., impressionable) as self-descriptive, and were faster at categorizing dependent adjectives than independent ones (e.g., assertive). Opposite results were found for those who scored high on independence. More recently, Aron, Aron, Tudor, and Nelson (1991) used a similar reaction time methodology to show that married people's representations of the self overlap their representations of their spouses; people were slower at reporting adjectives as self-

descriptive when those adjectives were not descriptive of the spouse, suggesting what Aron et al. called "confusion" between self and spouse identities. Smith and Henry (1996) extended the research by Aron et al. to large social groups such as fraternities and sororities.

The underlying assumption of this research on cognitive representations is that traits are organized around and linked to different categories related to the self, other people, and groups. If a particular trait is linked to both the self and a group of people, reaction time for identifying the trait as descriptive of the group will be facilitated. In essence, reaction times can determine the amount of overlap between the self and social categories. The idea of matching was used frequently in research on health-related prototypes, such as the "typical smoker."

Risk Images and Prototype Matching

In a discussion of why children experiment with smoking, Leventhal and Cleary (1980) reported that grade school children view smokers and nonsmokers as having strikingly different personality characteristics. According to British researchers, children viewed smokers as tough, mature, easygoing, and rebellious, as well as foolish and lazy (Bland, Bewley, & Day, 1975). Although these characteristics are not completely complimentary, Leventhal and Cleary argued that smoking represented attainment of positive qualities for some children who found the image of the smoker exciting. Because the image associated with smoking was a goal state for these children, Leventhal and Cleary proposed that "these inviting aspects of the image may encourage experimentation with smoking, and we believe they may form one basis for becoming a smoker" (p. 384). In a survey of high school students, Chassin, Presson, Sherman, Corty, and Olshavsky (1981) found that smokers were perceived fairly negatively (e.g., nervous, foolish, "acting big"), but also tough.

Students who smoked tended to describe themselves similarly to the smoker stereotypes. Significantly, nonsmokers who were similar to the smoker stereotype reported intending to begin smoking in the near future; this self-smoker matching phenomena has also been found by others (Grube, Weir, Getzlaf, & Rokeach, 1984; Burton, Sussman, Hansen, Johnson, & Flay, 1989). In a later study, Chassin and colleagues found that smokeless tobacco conveyed a similar image (e.g. toughness, rebellion) but tended not to have the negative qualities associated with cigarettes, even among those who were non-tobacco users (Chassin, Presson, Sherman, & Margolis, 1988). Similarly, teens have reported that images of those who drink alcohol were ambivalent but admired, and congruence between self- image and drinker image was associated with being a drinker (Chassin, Tetzloff, & Hershey, 1985).

In general, this research on drinking and smoking suggests that young people engage in prototype matching, as in the social schema research. People compare their self-image to the image associated with the behavior in question, and overlap between the self and the image predicts initiation of smoking or drinking. There is also evidence that people use prototype matching for other types of social behaviors (Moss and Frieze, 1993; Setterlund and Niedenthal, 1993; Niedenthal et al., 1985). For example, when making decisions about living arrangements, college students compare themselves to the type of person in different living situations and choose housing based in part on similarity between the typical resident and themselves (Niedenthal et al., 1985).

Decisions about risk behaviors, however, are different from decisions about living arrangements. Given the amount of information children and teens now receive about health-related risks, it seems unlikely that risk images are goal states (Gibbons, Gerrard, & Lane, 2003). For example, in a recent survey of 8th, 10th, and 12th grade students, Johnston,

O'Malley, & Bachman (2003) reported that teens' views of smokers are becoming increasingly negative. Thus, it is not surprising that Gerrard et al. (2002) found that both drinking and nondrinking adolescents view the typical person who drinks frequently much less favorably than their own self-images. On the other hand, the image of the typical non-drinker was viewed more favorably than the self-image among adolescents who did not drink, suggesting that the non-drinker prototype was a type of goal state for these abstaining teens.

Social Comparison

The idea that people are examining risk images in order to make decisions about themselves suggests that they are performing some type of social comparison. Social comparison was originally conceived as a way for people to evaluate themselves in the absence of objective standards (Festinger, 1954). For example, people who want to evaluate whether their alcohol consumption was unhealthy might prefer some sort of test, such as a test that measures liver damage. However, in the absence of such a test, people would instead use those around them as comparison targets, and gauge their drinking and general health relative to these targets.

The original theory emphasized that people socially compare in order to evaluate themselves accurately. But many situations exist in which people will overlook accurate sources of information in favor of sources that portray them in the best possible light. Later refinements of the theory added this idea of self-enhancement as another motive for social comparison (Wheeler, 1991). Even if a liver-damage test existed, people might bypass it and compare their health with other drinkers, because using the objective test might uncover the unpleasant truth that their drinking was unhealthy. In essence, people might not want

accurate information because they would prefer to justify their current behavior.

One of the primary ways that people practice self-enhancement is through comparison with others who are worse off than the self, a process known as downward social comparison (Wills, 1981). In downward comparison, the comparison initiator always appears more favorable than the target, thus preserving the initiator's self-esteem. In their classic work on coping, Taylor, Wood, and Lichtman (1983) found that women with cancer frequently practiced various forms of downward comparison. One technique patients and their families used was to create new standards of adjustment that allowed them to compare themselves with hypothetical others who were coping poorly. For example, some husbands of cancer patients compared themselves with other husbands who had left their wives after the cancer diagnosis. In reality, very few men left their wives, suggesting these comparison targets were created by the husbands, and leading Taylor et al. to term these targets "mythical men."

The Prototype/Willingness Model

Using the threads of social schemata, risk images, and social comparison with constructed targets as a foundation, Gibbons and Gerrard have created the Prototype/Willingness (P/W) model (Gibbons and Gerrard, 1995; Gibbons and Gerrard, 1997; Gibbons, Gerrard, Blanton, et al., 1998; Gibbons, Gerrard, Ouellette, & Burzette, 1998; Gerrard et al., 2002; Gibbons et al., 2003). This model is designed specifically to address health-related risk behaviors in young adults. It expands on the theory of reasoned action, which posits that attitudes and perceived social norms about behaviors combine to create intention, which mediates the actual performance of the behavior (Ajzen & Fishbein, 1980). The theory of reasoned action has been criticized for being more effective at

predicting simple behaviors than complex social behaviors, (Eagly & Chaiken, 1993), and its success in predicting risk behaviors such as heavy drinking has been mixed (Gibbons, Gerrard, Blanton et al., 1998; Schlegel, D'Avernas, Zanna, DeCourville, & Manske, 1992).

Behavioral willingness and intention. The P/W model assumes that there are two cognitive antecedents to risk behavior: a reasoned cognition that is mediated by behavioral intention (BI), and a social reaction to the environment that is mediated by behavioral willingness (BW; see Figure 1). Reasoned cognition reflects that many behaviors are deliberate or planned. BI is usually operationalized by asking whether people intend to do a particular behavior, or how likely it is that they will do it (in which case it is called behavioral expectations or BE). Although both BI and BE incorporate the premeditated nature of reasoned cognitions, BE includes the recognition that some behaviors may not be entirely under an individual's control; for example, people might intend to get drunk but realize they do not have the means to obtain alcohol.

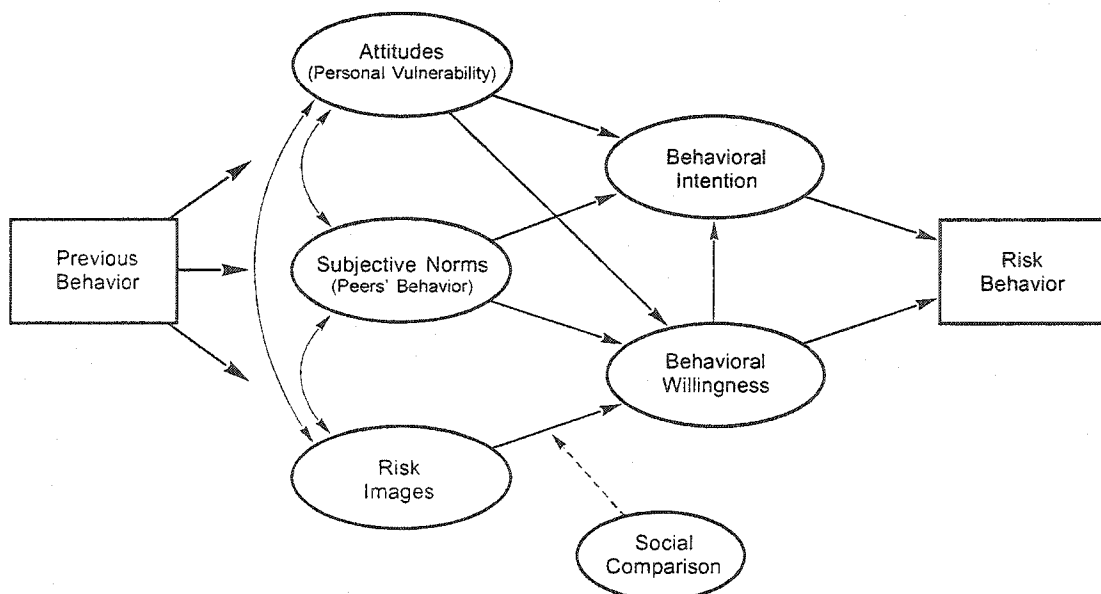


Figure 1. The Prototype/Willingness model

In many ways, the P/W model is similar to dual process models of information processing that have become prevalent in social cognition research (Gibbons et al., 2003). Most dual process models distinguish between an automatic, effortless, and heuristic -based form of decision making and a conscious, effortful, and systematic form (Chaiken & Trope, 1999). For example, in the Elaboration Likelihood Model, it is believed people process persuasive communications through a central, high effort scrutiny of the data or through a peripheral, low-effort reliance on cues and mental shortcuts (Petty & Cacioppo, 1986). When individuals are motivated and able to attend to a communication, they are more likely to process that communication centrally; but when they are unwilling or unable to pay attention, they rely on peripheral processing. Similarly, according to Cognitive-Experiential Self-Theory (Epstein, 1990; Epstein & Pacini, 1999), people use cognitive processing that relies on logic and reflection or the quicker experiential processing that relies on emotion and the use of heuristics to make decisions.

Relating to the P/W model, reasoned action is analogous to a central or cognitive route that relies on conscious processing, whereas social reaction is analogous to a peripheral or experiential route that relies on non-cognitive or “gut” responses. Epstein and Pacini (1999) explicitly refer to generalization and prototypes as the primary ways that people think abstractly when using the experiential system, suggesting that risk images would be influential in such a processing system.

Frequently, young adults report little intention or likelihood of engaging in risk behavior, even though such behavior is relatively common (Gibbons et al., 2003). The P/W model posits that the reason many young adults engage in risk behaviors, despite their expressed intentions not to do so, is that they are reacting to situational influences. Similar to

experiential, heuristic, or peripheral processing, social reaction is characterized by a lack of forethought or planning: if the right circumstances present themselves, some young adults respond by engaging in behaviors they had not originally intended. Social reaction is operationalized as willingness to engage in behavior when the right situation arises.

Individuals who are high in BW often have not considered the implications and consequences of risk behaviors, since they frequently were not planning on doing them. This lack of forethought leaves willing individuals particularly open to being influenced by social images, or prototypes, and thus more likely to engage in risk behavior. Prototypes are particularly effective at predicting adolescent health risk behaviors because of the social nature of these behaviors (Gibbons and Gerrard, 1997).

Risk images and willingness. A major assumption of the P/W model, therefore, is that people socially compare with their own images of the typical risk taker, and these comparisons influence both willingness to engage in risky behavior and actual behavior. Correlational studies have demonstrated this process, showing that prototypes are better predictors of willingness and subsequent behavior among individuals who frequently engage in social comparison than for individuals who do not (Gibbons & Gerrard, 1995). In these studies, participants are typically asked to think about the type of person who engages in a particular behavior (e.g., the typical drinker), then to rate a list of traits (e.g., smart, cool, self-centered) in terms of how well they describe that type of person. Unfavorable traits (e.g., self-centered) are reverse coded and combined with favorable ones (e.g., smart) to form an index of prototype favorability.

Because risk images are usually perceived fairly unfavorably, social comparisons with these images often lead to attempts to distance from these prototypes (Gibbons et al.,

2003). Just as people are motivated to contrast themselves with unfavorable or inappropriate social comparison targets (Collins, 2000; Buunk & Ybema, 1997), people are also motivated to contrast themselves with prototypes. Individuals with unfavorable prototypes, therefore, will attempt to contrast themselves with individuals who represent that prototype. This distancing may take the form of critical evaluations of partners, or decreased willingness to engage in risk behaviors (to behave the opposite as the prototype, in other words).

A second related assumption of the P/W model is that BW, because it represents individuals' reactions to situational influences, should be more malleable than BI. BW is formed through social comparison processes, most notably comparison with prototypes. BI, on the other hand, is relatively stable because it is based on past behavior and established attitudes about that behavior. Because it involves cognitive or "central processing," (in the vocabulary of dual process models) BI varies less due to the context; BW, involving experiential or "peripheral processing," is more likely to change based on the specific situation. Although this assumption has not yet been tested experimentally, the P/W model suggests that individuals' BW can be "moved" by environmental influences more easily than BI can.

Empirical evidence for the P/W Model

Correlational support for the model. Much of the research using the Prototype/Willingness model has been correlational, with longitudinal panels, and has shown repeatedly that risk images predict both BW and actual behavior (Gerrard et al., 2002; Gibbons, Gerrard, Blanton et al., 1998; Gibbons, Gerrard, Ouellete et al., 1998; Blanton, Gibbons, Gerrard, Conger, & Smith, 1997). In particular, BW has been found to predict behavior independently from and more strongly than BI (Gibbons, Gerrard, Blanton et al.,

1998), suggesting that, although BW is a more appropriate predictor than BI of risk behavior among young adults, both should be assessed (Gibbons et al., 2003).

Experimental support for the model. Experimental investigations of the effect of prototypes on BW are less common. Gibbons, Lane, Gerrard, Eggleston, and Reis-Bergan (2004, Study 2) asked participants to listen to a tape recording in which two acquaintances ostensibly described a third target person. In fact, the target was fictional, with participants learning about someone who varied on attractiveness and risk-taking. The target was described as very favorable (e.g., athletic, academically motivated, popular) or unfavorable (e.g., lazy, doing poorly in school, has few friends), and as either a virgin or someone who engaged in casual, unprotected sex. Participants' BW to engage in casual sex, assessed after learning about the target, was highest when they listened to a tape about the high-risk attractive target and lowest when they heard about the high-risk unattractive target. This drop in BW was interpreted as a form of distancing from the prototype. Similarly, Thornton, Gibbons, and Gerrard (2002, Study 2) had participants read about a target who engaged in high-risk sexual behaviors, and whose description was manipulated to appear either similar or dissimilar to the participants. Participants' reported favorability toward the target predicted BW to engage in unprotected sex, especially for those who read about a similar target. In both studies, the target was interpreted by the researchers as a representation of the prototype; this interpretation was supported in Gibbons et al. by the finding that targets in the different conditions led to changes in participants' prototype favorability, controlling for a pretest measure of prototypes.

In Blanton et al. (2001, Study 4), participants read a bogus newspaper article that described students who engaged in safe sex in very favorable terms or students who did not

engage in safe sex in unfavorable terms. Participants reported greater willingness to engage in safe sex when reading about an unfavorable prototype, suggesting that people's health decisions are based more on distancing from undesirable images than seeking desirable ones. Social comparison plays an implicit role in all these studies; it is assumed that participants are socially comparing with specific targets (as in Gibbons et al., 2004, and Thornton et al., 2002) or with a general group of people (as in Blanton et al.). But this important assumption, that social comparison with risk images affects risk willingness, has not been explicitly addressed in an experimental setting.

Untested assumptions of the model? The idea that prototypes are cognitions about others, and that comparison with these cognitions can lead to increased behaviors, has been inadequately tested. A critic could argue that people do not compare with prototypes, and that prototypes, BW, and BI all represent nothing more than a general attitude toward risk behaviors. In other words, they could be part of a general schema about drinking, and favorability toward the drinker prototype could predict BW to drink only because both share variance with this 'meta-schema' that represents overall favorability toward drinking. One of the unique aspects of the P/W model --that people's comparisons with internal schemas can lead to greater willingness to drink in certain situations -- could be argued to be a needlessly complex addition to a basic idea that people with generally favorable attitudes toward drinking will want to drink more. In a similar vein, BW is vulnerable to the criticism that it is simply a more detailed rewording of BI, rather than a theoretically distinct concept. In the absence of clear evidence for a social comparison process in which prototypes affect BW differently than BI, this more parsimonious view of risk cognitions cannot be effectively countered. On the other hand, this criticism could be discounted, and support for the P/W

model strengthened, if it could be shown that inducing people to socially compare with a prototype leads to increased BW but not BI.

Overview of Studies

This review of the research related to the P/W model highlights the necessity of an experimental examination of the effects of social comparison with risk images on BW and BI. To accomplish this, three studies were designed to examine an important but untested assumption of the P/W model, that prototypes affect BW (but not BI) through a social comparison process. Study 1 looked at social comparison by determining whether the link between participants' prototype favorability and their BW was affected by exposure to drinking or non-drinking comparison targets. The targets represented the prototypes, and differences in participants' BW when exposed to different targets were assumed to be a result of social comparison. This study also introduced a procedure, similar to that used by Markus (1977), which uses reaction time to measure the extent to which descriptors reflect participants' prototype of the typical binge drinker. One purpose of Study 1, therefore, was to establish a procedure for measuring prototype favorability and presenting participants with believable comparison targets. The ultimate goal was to determine whether prototype favorability and target drinking status would affect participants' reported willingness to binge drink. Study 2 added a measure of perceived similarity to the target as an indicator of social comparison interest. The purpose of this study was to replicate the findings of Study 1, and determine whether those results were moderated by perceived similarity to the target. Similarity has been used in the past as a measure of social comparison, so measuring it was an initial (non-experimental) way to assess whether prototype favorability affected willingness through social comparison with the comparison target. Study 3 expanded on

Study 2 by experimentally manipulating social comparison, to see whether participants who were explicitly instructed to compare with drinking partners had different patterns of results than those who were not instructed to engage in comparison. Thus, Study 1 established the experimental procedure, and Studies 2 and 3 assessed the extent to which social comparison affected the relationship between prototype favorability and BW.

This research reflects several developments that expand previous research. First, it incorporates a different method of measuring prototype perception, connecting this research to its roots in cognitive schema theories and providing a replication of previous prototype research. Secondly, it focuses on alcohol-related prototypes, to extend the findings from the aforementioned experimental studies to a different risk behavior. Because more young adults binge drink than smoke, engage in unsafe sex, or use illegal drugs (Wechsler & Wuethrich, 2002), it is important to further explore the antecedents of this most common of health-compromising behaviors. Most importantly, this research directly manipulates social comparison with drinkers in an experimental setting. Ultimately, the question this research attempts to answer is does prototype favorability affect BW and BI through a process of social comparison? This issue is a major -- although experimentally untested -- assumption in the P/W model, and this research is a logical extension of work on the P/W model that connects it with correlational research on drinker prototypes (e.g., Gibbons, Gerrard, Blanton et al., 1998, Gerrard et al., 2002).

STUDY I. REACTION TIME AND PROTOTYPE FAVORABILITY

INTRODUCTION

As an initial exploration, Study 1 attempted to replicate previous research (e.g., Gibbons, Lane, et al., 2004) that showed that participants' reactions to comparison targets who represent prototypes affected their willingness to engage in risk behavior. Manipulating the characteristics of targets is an indirect measure of social comparison with prototypes because the target represents the risk image or prototype. When target characteristics are manipulated in experimental settings, participants' reported willingness to engage in risk behaviors also changes, presumably because of social comparison (Gibbons et al., 2003). In Study 1, these findings were extended by a) creating a new procedure that assessed responses to drinking and non-drinking targets, b) comparing the traditional measure of prototypes with a computer-assisted method designed to better tap into schema strength of the risk image, and c) determining if these measures could predict willingness to drink heavily.

In addition to measuring self-report of agreement with prototype adjectives, the computer version also measured time to respond to each adjective (Markus, 1977). The assumption behind the use of reaction time (RT) is that when participants feel a specific adjective is very descriptive of the prototype, they will respond more quickly; RT, therefore, can be employed as a measure of the strength of association between individual adjectives and the prototype; i.e., a decision that is made quickly indicates that the particular adjective is clearly descriptive, while a decision made slowly indicates difficulty in deciding whether the adjective is descriptive. This method was employed in early research on social schemas to assess the overlap between different mental representations (e.g., Markus, 1977). Once a category (e.g., the typical drinker) is activated, traits that are central to that category will be accessed quickly. The present research, therefore, takes a connectionist perspective that is

believed to more accurately measure how social categories are cognitively represented (Smith, 1996). One advantage over the traditional “pencil-and-paper” measure is that less self-presentation bias is involved. More specifically, both prototype measures assess level of agreement that a particular adjective describes the prototype, but participants completing the RT measure do not realize that the length of time to make the decision is also a measure of their attitude toward the prototype.

It was hypothesized that participants' prototypes of heavy drinkers and the drinking status of a comparison target would predict participants' impressions of that target and BW to drink. Participants learned about fictional partners, supposedly in nearby rooms, who described themselves as either drinkers or non-drinkers. Participants then evaluated the partners and reported their BW to drink heavily. Evaluation of the partner was included because favorable partner impressions were expected to affect BW, and may reflect interest in social comparison. In other words, liking a drinking comparison target might lead to increased BW. It was predicted that prototype favorability and partners' drinking status would be associated with partner evaluations and BW; i.e., those with more favorable drinker prototypes and those exposed to drinking partners would report higher evaluations and BW.

METHOD

Participants and procedure

A total of 32 males and 26 females participated in this study. The study was described as research on how small groups evaluate campus activities. Participants completed the experiment in private rooms; 1-3 other participants of the same gender were in adjacent private rooms at the same time, completing the same measures. Participants first completed traditional paper-and-pencil measures of prototypes. Next, participants were shown the RT measure on computer (see below). After completing the prototype description tasks, participants were told that the main portion of the study involved their evaluation of a campuswide event that was being planned for next semester. "What's on Wednesdays" was described as a weekly social event designed to keep people on campus Wednesday evenings; it involved free or low-cost food and entertainment. Participants read a one-page description of the event, then answered several open-ended questions assessing their opinions about it (e.g., "what do you like about this event," "what is your evaluation of the likelihood of success of this event"). After participants completed the evaluation form, the experimenters told the participants that they were going to read another participant's completed evaluation as a prelude to meeting this other participant and making a final recommendation about the campus program. The "partner" was in fact not real. All participants received one of two evaluation forms. Both forms were identical (mildly positive, pointing out both pros and cons of the event) until the last question, which concerned the perceived likelihood of success. For the drinking partner condition, the written response was "I'm not sure how successful it will be. I know for me personally I like to go out drinking with my friends, and I think a lot of other people do too. So I wonder if people will want to come to the Union

when you can't drink there." For the non-drinking partner condition, the response was "I'm not sure how successful it will be; I know for me personally, I don't drink when I go out with my friends, but I think a lot of other people do. So I wonder if people will want to come to the Union when they can't drink there." Thus, partners in both conditions provided the same evaluation of the event and the same information about the prevalence of alcohol use, but in one condition they indicated they did not drink while in the other condition they did. In the final stage of the study, participants completed a questionnaire that first assessed their impression of their partner, then their willingness to perform different behaviors in specific situations. Some of the willingness questions were camouflage (e.g., willingness to go see a comedian on campus), but the key question assessed willingness to drink heavily.

Measures

All participants completed prototype measures of "the typical ISU student" and "the typical person your age who frequently gets drunk (for example, at parties)." The student prototype was included as a practice RT measure for participants. The traditional prototype measure was a paper-pencil scale that began with the instructions "Please think about the typical We are not suggesting that they are all alike. Rather, we are interested in what traits you think this type of person is likely to have (in other words, what most people in this group are like)." A list of 22 characteristics (e.g., popular, immature) followed, with instructions that participants were to select a number from an accompanying scale to indicate how descriptive each characteristic was; the scale ranged from 1 (*not at all*) to 7 (*extremely*). Of the 22 adjectives, 9 responses were favorable adjectives (popular, fun loving, considerate, optimistic, self-confident, independent, smart, "cool," and outgoing), 9 were unfavorable (lazy, depressed, careless, dull (boring), confused, self-centered, immature, loses temper,

unattractive), and 4 were ambiguous (conservative, rebellious, takes risks, likes adventure).

Data for the RT prototype measure were collected on computer using E-Prime software. The RT measure began by describing the prototype in a near-identical fashion as the traditional measure, and used the same 22 adjectives. Instead of a 7-point response scale, participants' task was to decide whether the adjective did or did not apply to the typical drinker by pressing one key if the adjective was descriptive and another key if it was not descriptive. Experimenters explained that both speed and accuracy were important, and to respond with their "gut" reaction. For example, participants read the statement "is the typical person your age who frequently gets drunk ... " followed by the word "popular;" participants pressed a key to indicate either "yes" or "no," and a new adjective immediately replaced the word "popular." The software recorded both participants' responses and their reaction times to make those responses. Thus, both measures used the same prototype description and adjectives, but participants completed the traditional measure using a 7-point scale, while they completed the RT measure by making a yes/no judgments that also recorded the length of time to make that judgment.

Partner impressions were assessed by asking participants "do you think you will like your partner?" Responses were on a 7-point response scale, from 1 (*not at all*) to 7 (*extremely*). Finally, BW was assessed by describing a situation: "Suppose that you are at a party with some friends. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a very attractive man/woman you had been wanting to meet asks you to stay and offers to get you another drink." Participants indicated how willing they would be in that situation to have one additional drink, have more than one drink, stay at the party but not drink, and ask for the person's phone number and

leave the party. Each response used a 7-point response scale, from 1(*not at all willing*) to 7(*very willing*).

RESULTS

Descriptive statistics

Because of strong suspicion over the existence of the fictional partner, 2 participants (1 male, 1 female) were dropped from analyses. For the traditional prototype measure, unfavorable adjectives were reverse coded and responses to adjectives (excluding neutral ones) were averaged to form an index in which high scores indicated a favorable attitude toward the typical heavy drinker ($\alpha = .78$).

The RT prototype measure involved more complicated calculations. First, RT responses for adjectives were subtracted from the maximum response so that quick responses, indicating strong agreement, would have larger values (just as for the traditional measure, greater agreement on adjectives' descriptiveness was represented by larger values). Because response times are frequently skewed and their variances are not stable (Greenwald, McGhee, & Schwartz, 1998), log transformations were next used on the values. To combine individual adjectives into an index, RTs for favorable adjectives that were judged as descriptive and RTs for unfavorable adjectives that were judged as not descriptive were given positive values, while RTs for favorable adjectives that were not judged as descriptive and unfavorable adjectives that were judged as descriptive were given negative values. In other words, adjectives that reflected favorably on the prototype (e.g., favorable adjectives that were judged as descriptive) were given a positive value and adjectives that reflected unfavorably on the prototype (e.g., favorable adjectives that were judged as not descriptive) were given a negative value. For example, a participant with a favorable image might respond quickly that the typical drinker is popular (favorable/descriptive) and quickly that the drinker is not boring (unfavorable/not descriptive). After subtracting these values from the

maximum value, then, the RT for these adjectives would have a large positive number. This same participant might also respond slowly that the typical drinker is not smart (favorable/not descriptive) and slowly that the drinker is immature (unfavorable/descriptive). The RT for these adjectives would be a small negative number (because a slow response becomes a small value), and when all values were averaged this participant would have a positive value, indicating a favorable prototype. This computation created an index that was similar to that of the traditional measure, but used a different metric in which positive values indicated a favorable prototype, negative values indicated an unfavorable prototype, and zero indicated a neutral prototype ($\alpha = .75$).

The two BW responses that involved drinking were highly correlated ($\alpha = .94$), and including either or both of the non-drinking responses substantially lowered reliability (all α 's $< .73$). By themselves, the non-drinking BW responses were only weakly related to each other ($\alpha = .57$). In retrospect, willingness to *not* drink is difficult to interpret, and may have been confusing to participants. Therefore, only the drinking responses -- *stay and have one more drink*, and *stay and continue to drink more than one drink* -- were used to calculate BW. This two-item measure is frequently used for BW (e.g., Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004; Gibbons et al., in press).

As Table 1 shows, the RT prototype index was highly correlated with the traditional prototype. Both prototype measures were also positively correlated with BW, although values were marginal for the RT measure and non-significant for the traditional measure. In general, participants were neutral about their images of the typical drinker, $M = 4.06$ on a 7-point scale for traditional prototypes and $M = .19$ with a range of -2.60 to 2.67 for RT prototypes. They reported a favorable impression of their partners, however, $M = 5.29$ on a

Table 1. Means, correlations, and standard deviations (Study 1)

	1.	2.	3.	4.	M	SD
1. RT Prototype	--	.78***	.37*	.35+	.14	1.47
2. Traditional Prototype	.82***	--	.32+	.23	4.08	.48
3. Target Liking	-.44*	-.27	--	.06	5.50	.95
4. BW	.39+	.33	.06	--	2.92	1.91
<i>M</i>	.24	4.05	5.10	3.93		
<i>SD</i>	1.21	.56	.93	2.12		

Note. Values above the diagonal are for participants in the Drinking Target condition ($N = 30$), values below the diagonal are for participants in the Non-drinking Target condition ($N = 26$). Traditional prototype, partner liking, and BW are on 7 point response scales. RT prototype responses range from -2.60 to 2.67.
+ $p < .10$, * $p < .05$, *** $p < .001$

7-point scale. Finally, their BW to drink heavily was fairly low, $M = 3.46$ on a 7-point scale.

Partner evaluation

To determine the effect of prototype favorability on partner evaluation, the partner liking question was regressed onto partner condition (coded as 1=drinking partner and -1 as non-drinking partner), RT prototype (standardized), and the product of these two variables. For the reaction time prototype measure, there were no main effects for either partner condition or prototype on partner liking ($\beta = -.21$, $t[52] = -1.66$, $p = .10$, and $\beta = -.00$, $t[52] = -.01$, $p = .99$ for condition and prototype, respectively). But the interaction of the two terms was significant, $\beta = .40$, $t(52) = 3.19$, $p = .002$ (see Table 2). Computation of the simple slopes revealed that, among participants with non-drinking partners, partner liking was negatively associated with prototype favorability ($\beta = -.44$, $t(28) = -2.42$, $p = .02$); as prototype favorability decreased, evaluation of the non-drinking partner became more favorable.

Table 2. Regression of partner evaluation on drinker prototype favorability and partner drinking (Study 1)

Predictor	RT Measure		Traditional Measure	
	β	t	β	t
Prototype	-.00	-.01	-.18	-1.35
Partner	-.21	-1.66	.01	.06
Prototype X Partner	.40	3.19**	.29	2.16*

Note. $N = 55$. For the RT measure, total $R^2 = .20$; for the traditional measure, total $R^2 = .12$. Prototype favorability is standardized. For partner drinking, -1 = non-drinking, 1 = drinking.

* $p < .05$, ** $p < .01$

Among participants with drinking partners, the relation was opposite ($\beta = .37$, $t(24) = 2.11$, $p = .04$). Figure 2 depicts these results. For the traditional prototype measure, the pattern of results was similar: neither main effect was significant, $\beta = -.18$, $t(51) = -1.35$ and $\beta = .01$, $t(51) = .06$ for condition and prototype respectively, p 's $> .18$. The interaction was significant ($\beta = .29$, $t[51] = 2.16$, $p = .04$), but the simple slopes were not significantly different from zero (p 's $> .08$).

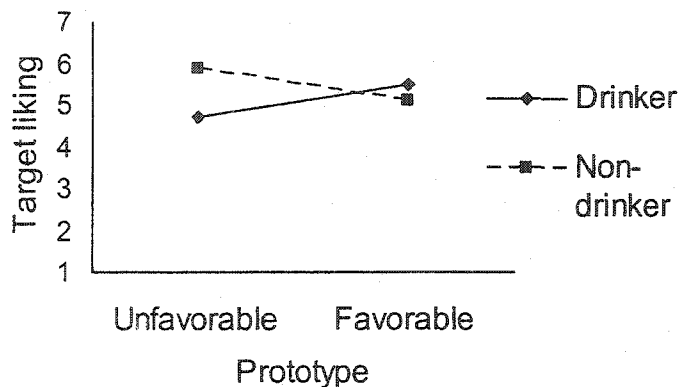


Figure 2. Participants' prototype favorability by partner drinking status predicts liking of partner (Study 1)

Willingness to drink heavily

When BW was regressed onto the RT measure of prototype, partner condition, and the product of these two variables, the RT measure significantly predicted willingness to drink heavily, $\beta = .36$, $t(52) = 2.83$, $p = .007$; the more favorable the prototype, the greater the BW. Partner drinking status was marginally significant, $\beta = .23$, $t(52) = 1.85$, $p = .07$, as participants with drinking partners reported greater BW than those with non-drinking partners. The interaction term was not significant, $\beta = .04$, $t(52) = .29$, $p = .77$. As a follow-up analysis, partner liking was added to the regression equation as a possible mediator of the relationship between prototype favorability and BW, but liking did not predict BW ($\beta = .07$, $t[51] = .50$, $p = .62$). When the same analyses were repeated using the traditional measure, results were similar: prototype again predicted BW, $\beta = .27$, $t(51) = 2.03$, $p = .05$, partner condition marginally predicted BW, $\beta = .23$, $t(51) = 1.77$, $p = .08$, and the interaction was not significant, $\beta = -.06$, $t(51) = .44$, $p = .66$. Similarly, partner liking did not predict BW when entered in a follow-up analysis ($\beta = .09$, $t[50] = .65$, $p = .52$).

DISCUSSION

Those with unfavorable drinker images reported liking non-drinking partners more than drinking partners. Although this interaction did not predict BW, those with more favorable prototypes and those who were exposed to a drinking target reported greater willingness to drink heavily. The RT prototype measure performed similarly to the traditional measure, suggesting that they were measuring the same construct. Although the results were promising, this study raised several issues.

First, the typical person who frequently gets drunk is a very high-risk and presumably negative prototype. It may be an overly extreme risk image, calling to students' mind a negative type of person, such as an alcoholic. Although this interpretation is belied by the means of the prototype indices (e.g., 4.06 on a 7 point scale for the traditional measure), it is possible that the "frequently gets drunk" prototype is too distinctive, an image that most college students would not envision as comparable to themselves, and thus an image that was only weakly predictive. On the other hand, prototypes have greater predictive utility when they represent a distinct group that is a minority of the population (Gibbons et al., 2003). To examine the possibility that a less extreme risk image would be a better predictor of attitudes, Study 2 looked at a more general drinker prototype.

Second, the presentation of information about the partner may have been too heavy handed. One participant who was suspicious of the existence of his drinking partner opined that people tend not to announce that they drink, making that particular statement sound unnatural. No one in the non-drinker partner condition expressed any such reservations; in fact, the two suspicious participants were both in the drinker partner condition. Given that the drinker image is not a goal state, whereas the non-drinker image appears to be (Gerrard et

al., 2002), the criticism is reasonable and the way in which the partner's drinking behavior was conveyed to participants may have been flawed. Therefore, in the second study, the procedure was changed slightly to convey information about the partner's alcohol use in a more believable manner.

Third, the two prototype measures were presented concurrently, with participants first completing the traditional measure and then the RT measure. Responses to one measure may have influenced responses to the other, suggesting that a between-subjects design is more appropriate. For example, completing the traditional measure first may have served as a warm-up for the identical items on RT measure, leading participants to respond more quickly to the RT measures than they would normally respond (thus throwing off the purpose of the RT measure, to gauge schema strength).

Fourth, BI was not assessed in Study 1, so the study did not address the effect of prototype perception on BI. This is an important area of research because the research showing that BW is independent of and more malleable than BI has been primarily correlational, not experimental.

Finally, this study did not examine the assumption that prototypes are hypothesized to affect BW through a social comparison process, while BI should not be strongly influenced by social comparison (Gibbons & Gerrard, 1997; Gibbons et al., 2003). Although exposure to a drinking partner appeared to change BW, suggesting a form of social influence, the comparison process was not explicitly examined in this study. Because BW is a form of social reaction, there is reason to believe that social comparison would affect BW and BI differently. Gibbons et al. (in press) studied children's and adolescents' risk cognitions, and found that the link between BW and risk behavior was moderated by the type of

neighborhood the youth lived in; for those in impoverished neighborhoods, the path from BW to behavior was much stronger than for those in less distressed areas. Gibbons et al. argued that some neighborhoods provide more examples of risk-takers, encouraging the onset of substance use through a social influence process. Supporting this interpretation, BI was not affected by type of neighborhood. Gibbons et al. also found that having friends who use substances was more strongly related to BW than to BI, further suggesting a social comparison process.

The general partner evaluation question, “how much do you think you will like your partner?” was unrelated to BW, so new questions that better tapped into social comparison were added: participants were asked how similar they were to the partners. Similarity to a comparison target is a way to measure interest in comparison with those targets; Festinger (1954), in his original conceptualization of social comparison, argued that people prefer to socially compare with someone similar in abilities or opinions. Empirical evidence suggests that people often do compare themselves with others who are similar (e.g., Hakmiller, 1966; Helgeson & Mickelson, 1995; Gibbons, Gerrard, & Boney-McCoy, 1995; Gibbons et al., 2002). Notably, Thornton et al. (2002) led participants to believe that a comparison target was either highly similar or dissimilar on several attitudes. Thornton et al. found that target similarity predicted BW to engage in risk behaviors; the effect of similarity on BW was interpreted as a social comparison effect.

**STUDY II. SOCIAL COMPARISON
AND THE DRINKER PROTOTYPE**

INTRODUCTION

To summarize, the goals of Study 2 were for participants to a) report their perceptions of a prototype that was less extreme in behavior than in Study 1; b) respond to either a traditional prototype measure, or an RT measure, c) learn about their partners' drinking behavior in a more subtle way; d) report both their BW and their BI, and e) report their perceived similarity to their partners as an indicator of social comparison interest. The "typical person who drinks regularly" was chosen as a more conservative, less extreme drinker prototype. This prototype is similar to previously used drinker prototypes, such as those in Blanton et al. (1997) and Gerrard et al. (2002); these researchers assessed participants' perceptions in longitudinal surveys of the typical person who drank "frequently" and found that this prototype predicted subsequent drinking. This time, likelihood of having too much to drink (BE) was used as the measure of reasoned action. Like BI, BE is a measure of reasoned action. It comes from the Theory of Planned Behavior (Ajzen, 1991), a modification of the Theory of Reasoned Action. By using asking about likelihood instead of intention, BE incorporates the idea of control over behavior. Individuals may desire and intend to engage in risk behavior, for example, but may not be able to because of factors beyond their control (e.g., lack of access to alcohol). BE is a more conservative reasoned action measure, but is predicted to operate similarly to BI.

One concern with having participants report both their BW and their BE was that the act of responding to one variable would affect the other. For example, Lindsay and Anderson (2000) report that in aggression research it is difficult to measure all desired variables because getting participants to report aggressive thoughts affects later variables of interest in the study (such as aggressive behaviors). Lindsay and Anderson call this difficulty

in measuring related variables the psychological uncertainty principle, because “measurement of one variable may well change the psychological processes at work, thereby changing the value of downstream variables” (p. 534). Similarly, reporting BW and BE concurrently may lead to one variable affecting the other; for example, participants who report a high willingness to engage in a certain behavior have effectively anchored their response, and may be unlikely to report anything but high intention when next asked. It would be very difficult to compare the effects of BW and BE under these circumstances, because response to one variable could “contaminate” responses to the other variable. To determine whether the psychological uncertainty principle is affecting data, Lindsay and Anderson recommend experimentally varying the order of the variables of interest. Because responses to the BW and BE questions might contaminate each other, participants in the sample therefore were randomly assigned to report either their BW first or their BE first, effectively dividing the sample into participants who reported BW versus those who reported BE. To summarize, the study had a 2 (type of prototype measure) by 2 (partner drinking status) by 2 (BW or BE questions) design.

It was predicted that prototype favorability would predict BW, and that this relationship would be moderated by social comparison interest. In Study 2, comparison interest was operationalized as perceived similarity to the partner. People are more likely to socially compare with those they perceive as similar (Thornton et al., 2002; Hakmiller, 1966), so it was predicted that the prototype-BW association would be strongest for those who perceived the greatest similarity with their drinking partners.

METHOD

All participants initially completed a large survey as part of a psychology department extra credit opportunity. Frequency of past heavy drinking, operationalized as consuming more than 4 drinks in a single setting during the last 3 months, was assessed in this survey. Students who participated in this “mass testing” session were eligible to be contacted for further participation in experimental studies. A total of 86 college students, randomly selected from the testing session list, were contacted by phone and agreed to participate; of those, one was dropped from analysis for failure to follow instructions, and two because of suspicion about the existence of the partner. This left a sample of 27 males and 56 females, who were approximately evenly distributed in the partner conditions, whether they reported their BW or their BE first, and whether they completed the RT or traditional prototype measure.

Study 2 followed a similar procedure to that of Study 1. Once again, participants were recruited for a study on attitudes toward people and events. At the start of the session (after introductory remarks and informed consent), participants were randomly assigned to complete either the traditional or RT prototype measure. Prototype measures were similar to Study 1, except that participants either completed one or the other (not both). Participants first evaluated “the typical ISU student” as a practice measure, then evaluated the “typical person your age who drinks regularly.”

Next, participants were again told that the main purpose of the study was for them to evaluate a planned campus event to be held at the Union. After reading the description of the event, which was similar to that in Study 1 except that the event was held on a Thursday (because pilot data suggested drinking was more normative on that day), participants

completed several open-ended evaluation questions. This time, participants also were asked to complete a short questionnaire describing themselves, allowing them to indicate their age, gender, and involvement in student groups or athletics. Finally, they were asked to describe what they did last Thursday night, "In order for us to get a better understanding of the types of things ISU students like to do on weeknights." Participants were also asked to rate how typical the described Thursday night activities were for them, from 1(*never done this before*) to 7 (*frequently do this*).

Participants were again told they would be working with partners to make a final evaluation of the planned event. It was emphasized this time that they would not actually meet other participants to avoid being swayed by appearance or behavioral characteristics, but would first read their partners' comments and then talk to them over the intercom system. Actually, participants were again randomly assigned to either the drinking or non-drinking partner condition. After completing their evaluation of the campus event, participants were given what was ostensibly their partners' evaluation sheets. All sheets were the same (e.g., all partners were age 19, went to the Union occasionally), except for the description of the previous Thursday night. In the drinking partner condition, this section described going to a party, having a few beers, and enjoying the evening, along with the notation that this event was typical (rated as a 6 on the 7-point scale). In the non-drinking partner condition, the partner also described going to a party with some friends, but not drinking because they were not drinkers.

Participants received a final questionnaire that began by asking how carefully they had read their partner's information, and continued with several questions about their evaluation of the partner: how much did they agree with their partner about the campus

event, how easy would it be to work with their partner, how generally similar they were to their partner, how similar on attitudes about school, how similar on attitudes about socializing, and how much did they think they would like their partner. Of these evaluative items, general similarity, similarity in school attitudes, and similarity in social attitudes were included as indicators of interest in social comparison. Finally, participants answered questions assessing first willingness to do various activities, including drink heavily, followed by likelihood of doing the same activities, or the reverse (likelihood followed by willingness). The willingness items were identical to those in Study 1; the expectation measure was “how likely is it that you will have too much to drink (get drunk) in the next year?” followed by a 7 point scale (from 1 *not at all likely* to 7 *very likely*). Experimenters concluded the sessions by probing for suspicion, explaining the purpose of the study, and thanking participants for their involvement.

RESULTS

Descriptive statistics

Prototype indices were computed for the traditional and RT measures using the same methods as in Study 1. Both measures had similar alphas (traditional $\alpha = .83$, RT $\alpha = .82$). Likewise, BW was identical to Study 1 in computation (using the two drinking responses, $r = .83$).

Table 3 shows the correlations, means, and standard deviations for the relevant variables, separated by prototype measure and type of partner. In general, it can be seen that there are stronger intercorrelations with the RT prototype measures than with the traditional measure, and within the drinking partner group than within the non-drinking partner group. Because participants only completed either the RT or traditional prototype measure, the correlations between different measures had to be compared using the Fisher r -to- Z transformation and then making a pairwise comparison of the correlations (Hays, 1988). For those in the drinking partner conditions, the correlation between prototype favorability and BW was significantly larger for the RT prototype than for the traditional prototype ($r = .76$ vs. $r = .27$, $p = .03$). Although the correlation between the RT prototype and BW was larger than the correlation between the traditional prototype and BW for those in the non-drinking partner conditions, this difference was not statistically significant ($r = .78$ vs. $r = .55$, $p = .23$).

Willingness to drink heavily

The three social comparison items (similarity, social similarity, school similarity) were correlated ($\alpha = .81$) so they were combined to form a similarity index. This index was used to test the assumption that social comparison interest moderated the relation between

Table 3. Means, correlations, and standard deviations (Study 2)

	RT Prototype							Traditional Prototype						
	1.	2.	3.	4.	5.	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	<i>M</i>	<i>SD</i>
1. Past drinking	--	.47*	.41+	.50*	.51*	3.14	2.01	--	.21	.43*	.22	.20	4.17	1.93
2. Prototype	.18	--	.71***	.76***	.67**	.43	1.35	-.29	--	.37+	.27	.58**	4.33	.53
3. Similarity	.17	.21	--	.65**	.82***	4.60	1.05	-.20	.34	--	.58**	.70***	4.69	.87
4. BW	.06	.78***	.28	--	.66**	4.19	1.67	-.05	.55*	.16	--	.91***	4.61	2.14
5. BE	.14	.67**	.19	.80***	--	4.86	2.59	.16	.33	.13	.80***	--	5.08	2.61
<i>M</i>	3.55	.06	5.16	4.15	4.75			3.61	4.19	4.72	3.58	3.72		
<i>SD</i>	1.73	1.78	1.00	1.73	2.43			2.30	.59	.55	1.77	2.42		

Note. Values above the diagonal are for participants in the Drinking Target condition ($N = 21$ for RT, $N = 24$ for traditional), values below the diagonal are for participants in the Non-drinking Target condition ($N = 20$ for RT, $N = 18$ for traditional). Past behavior, traditional prototype, similarity, BE, and BW are on 7 point response scales. For past behavior, the scale ranges from 1 (no episodes involving more than 4 drinks) to 7 (16 or more episodes). RT prototype responses range from -2.60 to 3.53.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

prototype favorability and BW. BW was regressed onto RT prototype favorability, partner drinking status, similarity, prototype X partner, prototype X similarity, partner X similarity, and prototype X partner X similarity. Recall that the order of BW and BE questions was counterbalanced; because of concerns that responses to one type of question could contaminate responses to the other type, only participants who responded to the BW items first (and the RT prototype measure) were included in this analysis ($N = 18$). Similarity interacted with partner drinking status to predict BW, $\beta = -.73$, $t(10) = -2.27$, $p < .05$ (see Table 4). Among those with non-drinking partners, there was no association between partner similarity and BW, but among those with drinking partners, greater similarity to the partner predicted greater BW to binge drink (see Figure 3). Similarity also marginally interacted with prototype favorability, $\beta = .77$, $t(10) = 1.88$, $p = .09$; as expected, participants who reported high similarity had a positive association between prototype favorability and BW, while those who reported low similarity had no association. Finally, similarity, partner drinking status, and prototype favorability interacted together, $\beta = -1.18$, $t(10) = -2.76$, $p = .02$. Among those with drinking partners, differences in perceived similarity led to differences in BW. As Figure 4 shows, participants who perceived high similarity to their drinking partners reported a positive association between prototype favorability and BW, while participants who perceived low similarity reported a negative association. Due to the small sample, however, the simple slopes were not statistically different from zero, $\beta = 1.08$, $t(4) = 2.16$, $p = .12$, and $\beta = -1.51$, $t(3) = -1.67$, $p = .19$. This effect occurred only among those exposed to a drinking partner; participants with non-drinking partners reported positive associations between prototype favorability and BW, regardless of perceived similarity, $\beta = .83$, $t(7) = 5.50$, $p = .001$, and $\beta = 1.58$, $t(7) = 2.24$, $p = .06$.

Table 4. Regression of BW and BE on RT drinker prototype favorability and target similarity (Study 2)

Predictor	BW		BE	
	β	t	β	t
Prototype favorability	.39	1.21	.33	1.42
Social similarity	.64	2.05+	.35	1.24
Partner drinking	.39	1.70	-.16	-.79
Prototype X Partner	.63	2.11+	.17	.73
Similarity X Partner	-.73	-2.27*	-.23	-.84
Prototype X Similarity	.77	1.88+	.01	.03
Prototype X Similarity X Partner	-1.18	-2.76*	.15	.59

Note. $N = 18$ for participants reporting BW, $N = 22$ for participants reporting BE. For BW, total $R^2 = .88$; for BE, total $R^2 = .58$. Prototype favorability and similarity are standardized. For partner drinking, 1 = non-drinking, -1 = drinking.
 + $p < .10$, * $p < .05$

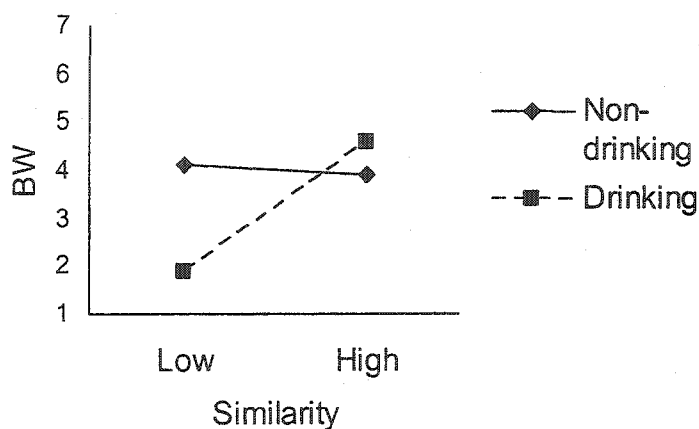


Figure 3. Partner drinking status by perceived similarity to comparison target predicts willingness to drink heavily (Study 2)

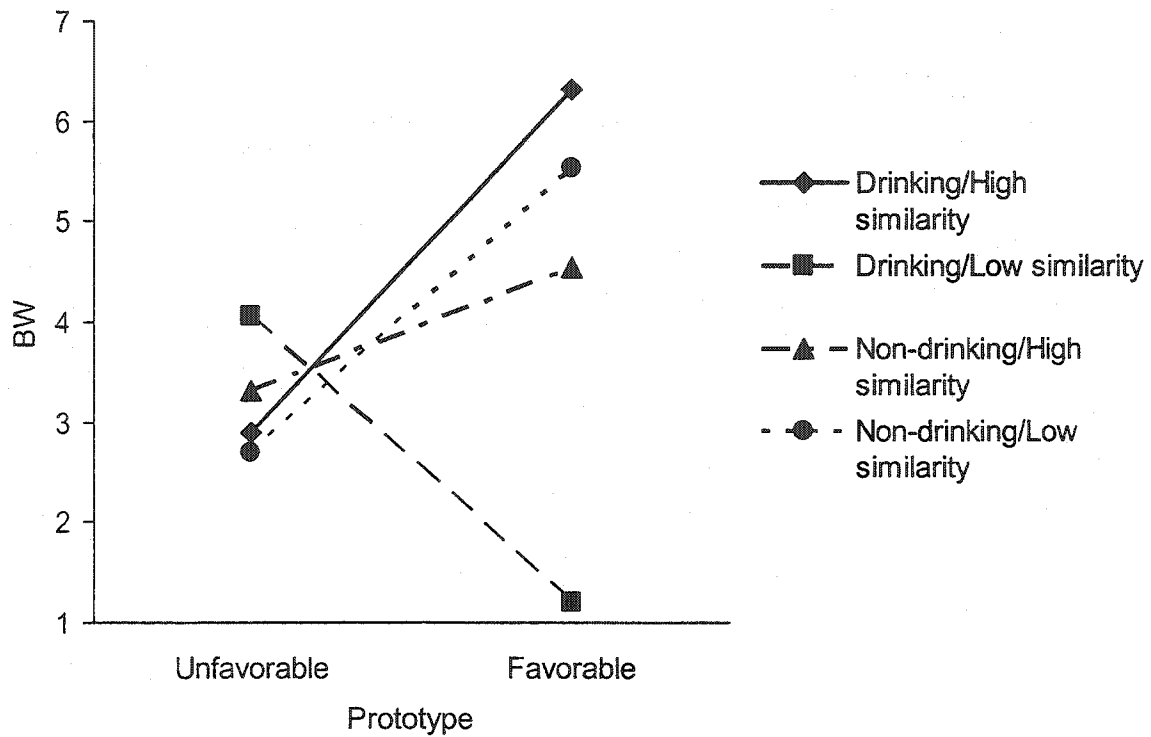


Figure 4. Partner drinking status by prototype favorability by perceived similarity to comparison target predicts willingness to drink heavily (Study 2)

For the traditional prototype measure ($N = 18$), no variables were significant predictors when all were entered. Likewise, when BE was substituted for BW ($Ns = 23$ for RT and 24 for traditional prototypes), there were no significant results. To sum up, favorable prototypes predicted more BW to binge drink if similarity to a drinking target was high, but less BW if similarity was low. There was no association between BW and either the traditional prototype or BE.

DISCUSSION

Due to the small sample sizes, care must be taken in interpreting these results. Nevertheless, the analyses involving similarity provided evidence that BW and BE are distinct concepts. As predicted, interest in social comparison, operationalized as perceived similarity, influenced the association between prototype favorability and BW, but not BE.

The lack of significant effects when using the traditional prototype measure supports the interpretation that the RT measure is a more sensitive measure of prototype favorability. Recall that in Study 1, all participants completed the traditional measure followed by the RT measure, making it a less-than-ideal comparison of the two measures. With its between-subjects design, Study 2 provides a better comparison. Not only did the RT measure produce significant effects when the traditional measure did not, but a comparison of the magnitude of the correlations between the samples shows that the RT measure was more highly correlated with BW when participants compared with drinking partners. Because drinker prototypes are usually viewed fairly ambivalently despite the prevalence of drinking (Gibbons et al., 2003), one explanation for the failure of the traditional prototype to predict BW as theorized is that participants are trying to portray their attitudes in a socially desirable rather than accurate manner. As Greenwald et al. (1998) have pointed out, however, it is more difficult to control responses involving reaction times. The RT measure therefore may be more accurate because participants' responses are less affected by social desirability.

Learning about drinking partners led participants to report greater BW, but only if they perceived themselves as similar to those partners. This result clearly suggests social comparison. Those with drinking partners who felt little similarity to those partners reported the lowest BW, indicating a form of distancing from that partner similar to that found in

Gibbons, Lane, et al. (2004). In the three-way interaction including prototype favorability, participants who felt dissimilar to their drinking partner reported a negative relationship between prototype favorability and BW; this also suggests a form of distancing. Collins (2000), Gibbons and Gerrard (1997), and Buunk and Ybema (1997) all noted that sometimes people socially compare in order to highlight the differences between themselves and others. That appears to be what is going on in the present study: when faced with drinking partners to whom they felt similar, participants with favorable images of drinkers reported greater willingness to drink. On the other hand, when faced with dissimilar drinking partners, greater prototype favorability led to less willingness to drink. This distancing effect indicates social comparison is at work.

Measurement issues

There were potential problems with the BW and BI/BE measures used in Studies 1 and 2. Recall that the heavy drinking BW questions are set up so that participants are imagining they are at a party, had several drinks, and are then offered another drink by someone they find attractive. Willingness to drink heavily is confounded with sexual attraction in this situation, creating potential confusion in interpretation of the results. For example, participants in committed relationships may report low willingness, not because they are uninterested in drinking, but because they are uninterested in flirting with a potential romantic partner. If the question had been worded so that a friend with whom participants wanted to talk offered the drinks, the situation would be more broadly applicable and representative of a typical drinking situation. Revising heavy drinking BW also makes it more similar to the drinking BW questions used in previous correlational research. The measurement of BE was also problematic. Asking likelihood of a behavior incorporates a

realization on the part of the participant that behaviors may occur even though they are not planned (e.g., "I don't always intend to get drunk, but I admit that it is somewhat likely to happen"). To clearly distinguish between social reaction and reasoned action, participants should be asked whether they intend or plan to engage in heavy drinking (i.e., BI).

Furthermore, BE was only assessed by a single item in Study 2, whereas BW had multiple indicators. Using multiple questions to assess BI would improve its reliability and allow more confident comparisons with BW.

Social comparison and BW

As discussed earlier, research on the P/W model has not focused explicitly on the role of social comparison in explaining the association between prototype and BW. Correlational studies have shown that individual differences in comparison orientation moderate the relation between prototypes and behavior (Gibbons & Gerrard, 1995). Thornton et al. (2002) experimentally manipulated attitude similarity as a proxy for social comparison interest, and found that participants who learned about a similar target who had engaged in high-risk sex were more likely to perceive themselves to be also at risk, and therefore less likely to report BW to engage in risky sex. Thornton et al. argued that this was evidence of BW being affected by social comparison. Likewise, the finding in Study 2 that similarity to a drinking partner led to a positive association between prototypes and BW is suggestive of a social comparison process. Although Thornton et al. manipulated perceived similarity to demonstrate the social comparison process, the current study reiterates that social comparison may be taking place even when there is little similarity – comparison in order to distance oneself from the target (Gibbons & Gerrard, 1997; Buunk & Ybema, 1997). By itself, therefore, high perceived similarity may not indicate whether social comparison is taking

place. Instead, an explicit manipulation of social comparison is needed. Because this is one of the major assumptions underlying the P/W model (Gibbons et al., 2003), an experimental manipulation of this social comparison process would be an important addition to our understanding of risk cognitions and behavior. Studying how social comparison affects BW would also provide further insight into how BW and BI differ. BI, because it represents planned behavior, should be less influenced by either individual differences in or experimental manipulations of social comparison.

STUDY III. SOCIAL COMPARISON WITH A HIGH-RISK TARGET

INTRODUCTION

Study overview

The goal of Study 3 was to test directly the assumptions in the P/W model that prototype favorability affects BW, but not BI, through a form of social comparison. The basic procedure was modeled after Studies 1 and 2, with participants completing the RT prototype measure, then evaluating a campus event and a fictional comparison target who was portrayed as being a heavy drinker. Because the focus was on social comparison with risk images, rather than reactions to partners, participants were only exposed to a risky comparison target (a heavy drinker). Furthermore, the RT measure was the only prototype used, rather than making a comparison between the two measures as in Studies 1 and 2.

Study 3 examined social comparison by asking participants to compare themselves with the target (SC salient condition), and consider how they are similar and dissimilar to that target. In addition, there was a control condition in which participants were not given any comparison instructions (SC non-salient). Thus the salience of social comparison was manipulated. Additionally, individual differences in comparison tendencies were assessed through a measure of comparison orientation. Finally, interest in social comparison with the target was measured by using the amount of time participants spent reading about the target (Gibbons et al., 2002, Study 1) and by again assessing perceived similarity to the target. Participants reported their BW (using a measure modified to eliminate confounding with attraction) and BI at the end of the study. BW and BI again were counterbalanced so half the participants reported their BW first, and half their BI first. The design, therefore, had an experimental manipulation, with prototype favorability, interest in target, and comparison orientation as continuous independent variables. Social comparison was examined both as a

moderator (comparison salience condition and comparison orientation) and a mediator (interest in learning about the target).

Predictions

Prototype favorability was expected to predict BW, with those who had more favorable drinker images reporting more BW than those who had unfavorable images. This would replicate longitudinal survey research (e.g., Gibbons, Gerrard, Blanton, et al., 1998). Because BI is frequently correlated with BW, it was also expected to show some association with drinker images; but this would be a function of shared variance between BI and BW.

Comparison salience was expected to moderate the effect of prototype on BW. As prototype favorability increased, those in the SC salient condition were expected to report more willingness than those in the non SC-salient condition. Because social comparison appears to be an automatic process (Olson, Buhrmann, & Roese, 2000; Gilbert, Giesler, & Morris, 1995), it is likely to occur even when it is not made salient. So a positive relation between prototype and BW was expected even in the control condition, but the correlation between prototype and BW was expected to be stronger for those in the SC salient condition. BI, because it operates along the reasoned pathway, was expected to be less affected by the comparison salience manipulation.

Interest in target was expected to mediate the association between prototype favorability and BW. The more favorably participants viewed the drinker prototype, the more interest they were expected to show in socially comparing with a drinker target. Comparison interest would in turn be positively related to BW. This mediation effect was expected to be primarily driven by participants in the SC salient condition, making this moderated mediation. BI was not hypothesized to be influenced by social comparison, so

there was expected to be little effect of interest in target on BI.

Social comparison orientation was also examined. Although the primary focus was on manipulation of SC salience, individual differences in the tendency to compare were included for exploratory purposes. The primary prediction was that, among those for whom comparison was not made salient, people high in comparison orientation would have higher BW than people low in comparison orientation. In other words, high comparers in the SC non-salient condition would report more BW than low comparers. Because everyone engages in social comparison, the manipulation of the comparison situation was expected to supercede individual differences in comparison orientation. The experimental manipulation was predicted to lead to a ceiling effect, so that the moderating influence of comparison orientation was not expected to be as strong in the SC salient condition (where participants are already engaging in substantial comparison).

METHOD

Participants

A total of 120 males and 140 females participated in the study. Participants were enrolled in introductory psychology courses and received extra credit. Students who reported in a mass-testing session that they had drunk alcohol in the past 3 months were contacted by telephone and asked to participate. A total of 27 participants (10.4%) were excluded from analysis because they reported suspicion that their partners were fictional. To determine whether there were any systematic differences between those who were included and excluded from analysis, the two groups were compared using a series of t-tests. There were no differences between groups on past drinking behavior, time spent reading about target, target similarity, comparison orientation, BW, or BI. There was a just significant difference on prototype favorability ($p = .05$), with those who were excluded due to suspicion reporting less favorable prototypes than those who were included ($M_s = -.04$ and $.63$, respectively).

Procedure

As in the previous studies, 2-4 same-gender participants were run simultaneously. They were told that their task was to evaluate a planned campus social program, and that they would be communicating with another participant. Participants first completed RT prototype measures similar to those in Study 2, deciding whether a list of traits described their image of the typical colleges student (as a practice warm-up) and the typical heavy drinker, with computer software recording reaction times. The traditional prototype measure was not used in this study.

After completing the prototype measures, participants read on computer a description similar to those in the previous studies, about a new program of social events being held on a

weeknight at the student union. They evaluated this event using a paper questionnaire that also asked for demographic information. In particular, one question asked them to describe what they did on a recent weeknight, ostensibly so that researchers could “get a better idea of how students spend their time.” Then participants supposedly swapped their responses with a partner. As in Study 2, the partner was fictional, and all participants learned about a target who described going to a party on a recent weeknight and having several drinks. Before learning about targets, some participants were told to think carefully about what the target was like relative to themselves (SC salient condition). Others were not given these instructions (SC non-salient condition).

Participants were next asked to complete a computer-based questionnaire in which they provided an open-ended response describing a) ways they were similar to and different from the target (SC salient condition) or b) what they had done that day (SC non-salient condition). Finally, still on computer, participants evaluated their similarity to their partners and reported their willingness and intentions to drink heavily. BW and BI were counterbalanced so each appeared before the other for half the participants. At the end of the study, the experimenters probed for suspicion, explained that there would be no interaction with partners, and provided a full debriefing.

Measures

During a pretesting session similar to the one in Study 2, participants reported the number of times in the past 3 months they had any drinks and 4 or more drinks in a single setting (binge drinking). They also completed the Iowa-Netherlands Comparison Orientation Measure (INCOM, Gibbons & Buunk, 1999). The INCOM measures general tendencies to engage in social comparison and includes 11 questions such as “I always like to know what

others in a similar situation would do" ($\alpha = .82$).

The heavy drinker prototype ("the typical person your age who frequently gets drunk") was assessed at the beginning of the lab session. A 12-item set of adjective descriptors was used, because reliabilities were not substantially higher using the 18-item set in Study 2 (e.g., $\alpha = .87$ for 18 items vs. $\alpha = .84$ for 12 items in Study 2). The 12 items consisted of adjective descriptors frequently used by Gibbons and Gerrard (e.g., Gerrard et al., 2002; Gibbons & Gerrard, 1995): smart, confused, popular, immature, "cool" (sophisticated), self-confident, independent, careless, unattractive, dull (boring), considerate, and self-centered. As in the other studies, participants responded "yes" if they thought an adjective described the prototype and "no" if it did not, using the keyboard. The index was computed identically as in previous studies, and had a similar reliability ($\alpha = .72$).

Interest in the target was assessed by measuring the amount of time spent reading the targets' evaluation sheets. Reading time was measured indirectly, using the amount of time participants had the target information before they started completing the open-ended response question (about the target or their day, depending on condition). When experimenters presented participants with the target information, they pressed a key on the computer keyboard, and told participants to read the target information and press another key on the keyboard when they were ready to begin answering the next questionnaire. The software recorded the amount of time elapsed between keystrokes. To create the measure of social comparison interest, participants' time spent on the partner screen was divided by the time spent on an earlier instruction screen (one describing prototypes). This created a proportion that accounted for individual differences in reading time; participants who were slow readers would not be counted as engaging in greater amounts of social comparison than

their peers, because the time they spent on the partner screen would be proportional to the time they spent on the instruction screen. In addition, social comparison interest was also assessed by asking participants how similar in general they perceived themselves to be with the target (on a scale ranging from 1 *not at all* to 7 *extremely*).

Because of the concerns discussed earlier, BW was modified so that instead of being offered a drink by an attractive person of the opposite sex, participants imagined being offered additional drinks by friends. This made willingness to drink heavily similar in form to questions assessing willingness to drink any alcohol, used successfully in other studies (Blanton et al., 1997; Gerrard et al., 2002). Participants imagined having had several drinks already, and then indicated their willingness to take one drink and nurse it, drink multiple drinks offered, refuse all drinks, and leave the party. BI was assessed with three items: "do you intend to drink a lot in the next three months," "do you intend to get drunk in the next 3 months," and "are you planning to drink a lot in the next 3 months?" As in the previous studies, the two BW to drink items were combined ($\alpha = .90$), as were the two BW to not drink items ($\alpha = .54$). Because of unacceptably low reliability, non-drinking items were dropped and the drinking items were once again used for BW. The three BI items were reliable ($\alpha = .90$); to make it comparable to BW in number of items, the item "do you intend to drink a lot" was randomly excluded, resulting in no decrease in reliability.

RESULTS

Analytic design

The analytic procedure followed that of Study 2, using only participants who reported BW first and only those who reported BI first. Tables 5-8 show correlations and means for participants' responses on past binge drinking, prototype favorability, amount of time spent reading about the partner, and perceived similarity to the partner, separated by gender and BW/BI measure.

The descriptive statistics in Tables 5-8 raised the suspicion that there may have been unhypothesized gender effects. For example, among men, the correlation between prototype favorability and BW was higher in the SC salient condition than the non-salient condition, as expected; the opposite was true for women. Furthermore, men appeared to report higher mean levels than women for all variables measured. Binge drinking rates are typically higher among young adult males than among females (Wechsler & Wuethrich, 2002; Johnston, O'Malley, Bachman, & Schulenberg, 2004), making gender differences possible. To follow-up, males and females were compared on past drinking behavior, comparison orientation, prototype favorability, reactions to comparison targets, and BW/BI. Men reported significantly higher past alcohol use ($p = .02$), marginally higher past binge drinking ($p = .07$), and non-significantly higher BW and BI ($p = .11$ and $p = .10$, respectively). Men and women, therefore, reported slightly different attitudes and behaviors related to alcohol. Women reported significantly higher comparison orientation than men ($p = .01$), a finding supported by previous research on comparison orientation (Gibbons & Buunk, 1999).

More troubling was a survey on the gender of risk images completed by a different sample. In this separate, cross-sectional survey of 455 college students completed one year

Table 5. Correlations, means, and standard deviations for men who reported BW to drink heavily (Study 3)

	1.	2.	3.	4.	5.	<i>M</i>	<i>SD</i>
1. Past behavior	--	.23	.25	.53**	.69***	4.21	2.31
2. Prototype Favorability	.16	--	.04	.39*	.38*	1.11	1.56
3. Reading time	-.19	-.17	--	-.04	.24	84.90	74.99
4. Similarity	.45*	.41*	-.10	--	.33+	4.86	1.27
5. BW	.56**	.47*	.17	.55**	--	4.73	1.69
<i>M</i>	4.31	.52	76.54	5.28	4.69		
<i>SD</i>	1.87	1.52	28.12	1.03	2.03		

Note. Values for participants in the experimental condition ($N = 29$) are below the diagonal; values for those in the control condition ($N = 29$) are above the diagonal. Values for past behavior, partner similarity, and BW use 7 point scales. Values for prototype favorability range from -2.50 to 3.73. Values for reading time range from 5.47 to 150.75 seconds.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6. Correlations, means, and standard deviations for men who reported their BI to drink heavily (Study 3)

	1.	2.	3.	4.	5.	<i>M</i>	<i>SD</i>
1. Past behavior	--	.35+	.16	.33	.64***	4.46	1.79
2. Prototype Favorability	.34+	--	-.00	.65***	.42*	1.00	1.67
3. Reading time	.02	.19	--	-.05	-.06	99.04	145.86
4. Similarity	.08	.36+	-.34+	--	.46*	4.96	1.46
5. BI	.74***	.22	-.06	.17	--	5.73	1.87
<i>M</i>	4.20	.56	73.50	5.04	5.80		
<i>SD</i>	1.78	2.02	22.27	1.17	1.86		

Note. Values for participants in the experimental condition ($N = 25$) are below the diagonal; values for those in the control condition ($N = 26$) are above the diagonal. Values for past behavior, partner similarity, and BW use 7 point scales. Values for prototype favorability range from -3.08 to 3.75. Values for reading time range from 4.86 to 124.72 seconds.

+ $p < .10$, * $p < .05$, *** $p < .001$

Table 7. Correlations, means, and standard deviations for women who reported their BW to drink heavily (Study 3)

	1.	2.	3.	4.	5.	<i>M</i>	<i>SD</i>
1. Past behavior	--	.51**	-.18	.73***	.60**	3.44	1.85
2. Prototype Favorability	.26+	--	-.08	.39*	.60**	.57	1.56
3. Reading time	-.12	.03	--	-.07	-.05	69.19	16.03
4. Similarity	.56***	.01	-.09	--	.60**	4.74	1.38
5. BW	.71***	.05	-.07	.51**	--	3.91	1.37
<i>M</i>	3.73	.55	63.35	4.93	4.20		
<i>SD</i>	1.96	1.71	13.86	1.17	1.57		

Note. Values for participants in the experimental condition ($N = 41$) are below the diagonal; values for those in the control condition ($N = 27$) are above the diagonal. Values for past behavior, partner similarity, and BW use 7 point scales. Values for prototype favorability range from -3.74 to 3.75. Values for reading time range from 41.62 to 93.84 seconds.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 8. Correlations, means, and standard deviations for women who reported their BI to drink heavily (Study 3)

	1.	2.	3.	4.	5.	<i>M</i>	<i>SD</i>
1. Past behavior	--	.40	-.13	.59***	.62**	4.30	2.02
2. Prototype Favorability	.33+	--	-.09	.57**	.48**	.72	1.87
3. Reading time	.04	.06	--	-.42*	-.15	58.81	24.16
4. Similarity	.43*	.27	-.55**	--	.70***	5.19	1.42
5. BI	.76***	.48**	.01	.38*	--	5.61	1.96
<i>M</i>	3.97	.16	89.97	4.83	5.17		
<i>SD</i>	2.16	1.51	125.82	1.34	2.02		

Note. Values for participants in the experimental condition ($N = 29$) are below the diagonal; values for those in the control condition ($N = 27$) are above the diagonal. Values for past behavior, partner similarity, and BW use 7 point scales. Values for prototype favorability range from -3.72 to 3.15. Values for reading time range from 11.83 to 738.19 seconds.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

after the current study, only 5.5% of women who drank reported that their image of the typical binge drinker was female, while 45% reported their image was male (49.6% reported the image was equally either gender). In contrast, 51.1% of males reported that the typical drinker was male, 3.4% that it was female, and 45.5% that it was equally either gender. Half of all men and women perceive the typical drinker as male, while only 5% or less view the typical drinker as female. The prototype of the typical drinker, therefore, is male for many people. Because alcohol use, prototypes, and social comparison are the variables of interest in this study, these findings suggest gender should also be an additional between-subjects factor. Therefore, gender was added to the analyses. Although exploratory, the preliminary hypothesis was that prototype effects would be stronger for men.

Based on these considerations, the effects of gender, SC salience, and prototype favorability on BW and BI were analyzed, separately for each DV.¹ Although structural equation modeling was initially considered, this analysis would have required multiple groups with small sample sizes that might have affected statistical stability (Kline, 1998). Instead, multiple regression was used. BW and BI were separately regressed onto past behavior (included as a covariate to make the analysis more similar to the P/W model depicted in Figure 1), prototype favorability, SC salient condition, gender, and the interaction terms of these variables (prototype X SC salient, prototype X gender, SC salient X gender, prototype X SC salient X gender).

Prototype by SC salience by gender interaction

Table 9 shows the results of regressing BW on the aforementioned variables. Past

¹The regression was also analyzed using type of question – BW or BI – as a between-subjects variable. The resulting four-way interaction was significant, and the results were similar to the analyses presented separately. For ease of reading and interpretation, therefore, analyses for BW and BI are presented separately.

Table 9. Regression of BW and BI on prototype favorability, SC salience, and gender (Study 3)

Variable	BW						BI					
	B	SE	β	<i>t</i>	LB B	UB B	B	SE	β	<i>t</i>	LB B	UB B
Past behavior	.47	.06	.56	8.17***	.36	.59	.61	.07	.63	8.55***	.47	.76
Prototype favorability	.45	.13	.26	3.60***	.20	.70	.32	.14	.18	2.31*	.05	.60
SC salient	.07	.11	.05	.67	-.15	.29	.03	.13	.02	.21	-.24	.29
Gender	-.19	.11	-.11	-1.69+	-.41	.03	-.03	.13	-.02	-.22	-.29	.23
Prototype X SC salient	.01	.12	.01	.07	-.23	.25	-.00	.13	-.00	-.02	-.26	.26
Prototype X Gender	-.33	.12	-.19	-2.74**	-.57	-.09	.10	.13	.06	.77	-.16	.36
SC salient X Gender	.00	.11	.00	.01	-.22	.22	-.14	.13	-.07	-1.05	-.40	.12
SC salient X Gender X Prototype	-.29	.12	-.16	-2.41*	-.53	-.05	.19	.13	.10	1.45	-.07	.45

Note. $N = 124$ for BW, $N = 107$ for BI. For BW, total $R^2 = .52$; for BI, total $R^2 = .53$. Values for prototype favorability are standardized. Past behavior responses ranged from 1 (*never*) to 7 (*16 or more*) drinking episodes in last 3 months. For condition, SC salient = 1, non-salient = -1. For gender, male = -1, female = 1. LB = lower bound, UB = upper bound of 95% confidence intervals for B.
 + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

binge drinking behavior and prototype favorability were both significant predictors of drinking attitudes ($\beta = .56$, $t[115] = 8.17$, and $\beta = .26$, $t[115] = 3.60$, respectively, both p 's < .001). There was one two-way interaction between prototype favorability and gender, $\beta = -.19$, $t(115) = -2.74$, $p = .007$. As depicted in Figure 5, males' prototype favorability positively predicted BW (simple slope $\beta = .40$, $t[51] = 3.90$, $p < .001$) but, females' did not (simple slope $\beta = .06$, $t[63] = .63$, $p = .53$). For men only, more favorable drinker images were associated with greater BW to binge drink.

More importantly, the three-way interaction was statistically significant, $\beta = -.16$, $t(115) = -2.41$, $p = .02$. As Figure 6a shows, men in the SC salient condition reported a positive association between prototype favorability and BW (simple slope $\beta = .51$, $t[25] = 3.46$, $p = .002$); this relationship was only marginal for those in the SC non-salient condition (simple slope $\beta = .26$, $t[25] = 1.88$, $p = .07$). As predicted, when social comparison was

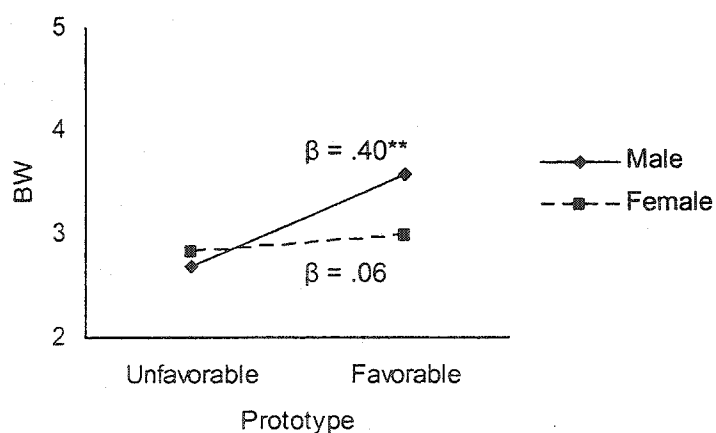
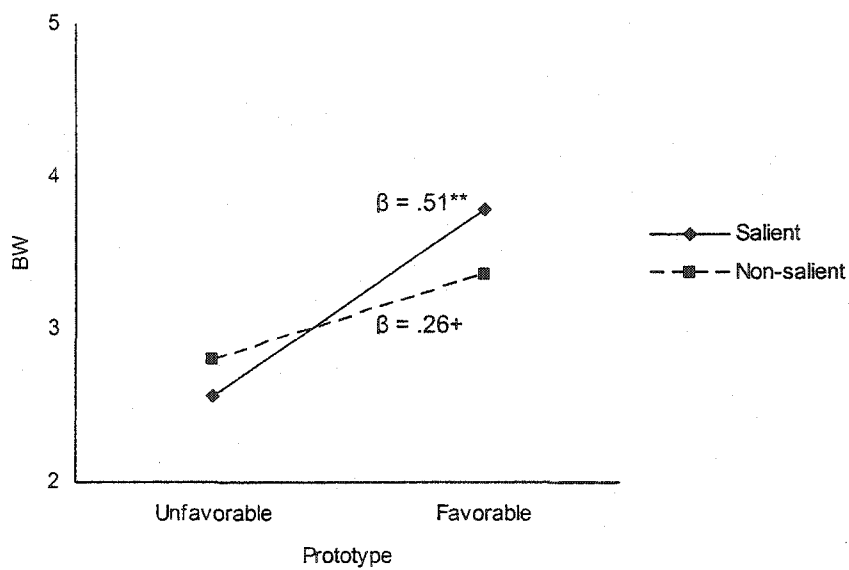


Figure 5. Interaction of prototype favorability and gender for BW (Study 3)

A) Males



B) Females

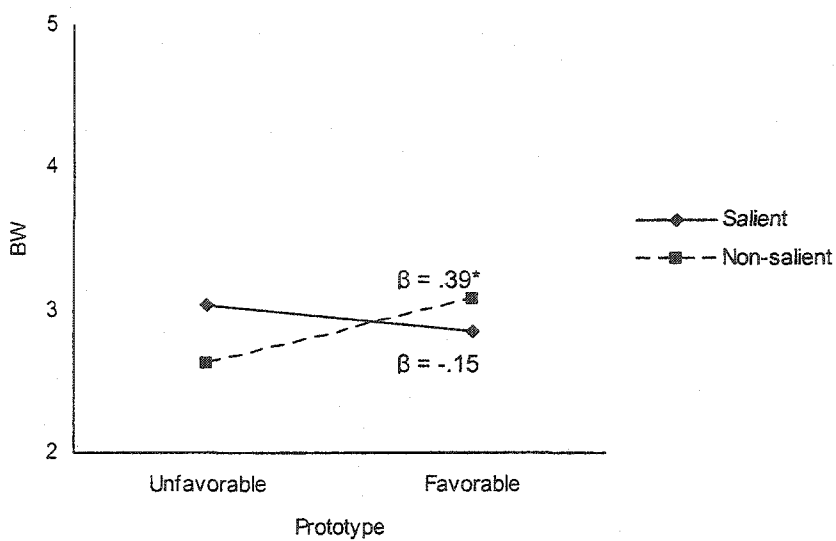


Figure 6. Interaction of prototype favorability, gender, and condition for BW (Study 3), males (A) and females (B)

salient, males' prototype favorability had a stronger effect on BW than when social comparison was not salient. Among women, however, the results were unexpectedly the opposite (Figure 6b). Prototype favorability was unrelated to BW in the SC salient condition, $\beta = -.15$, $t(38) = -1.25$, $p = .22$, but positively related to BW in the control condition, $\beta = .39$, $t(24) = 2.29$, $p = .03$. In other words, men and women had opposite reactions.

The analysis was repeated using BI as the dependent variable. Although prototype favorability and past drinking behavior continued to be significant predictors ($\beta = .18$, $t[98] = 2.31$, $p = .02$ for prototype, and $\beta = .63$, $t[98] = 8.46$, $p < .001$ for past behavior), no other predictors were significant. Thus, among men who had been instructed to socially compare with their partners, the more favorable their prototypes of heavy drinkers the greater their BW to binge drink; but there were no associations between prototype favorability and BI to drink.²

Social comparison mediation

To determine if the relationship between participants' prototype favorability and BW or BI was mediated by amount of social comparison, time spent reading about partners was included in the simple slope analyses. Unfortunately, reading time did not significantly predict BW for either gender in either condition (all p 's $> .29$)

²All analyses for BW were repeated using the participants who answered BW after BI. Likewise, analyses for BI were repeated using participants who answered it after BW. In both cases, only past behavior was a significant predictor. As an additional exploratory analysis, all participants were included, regardless of whether they reported BW before or after BI. When this was done, the only variables that were significant predictors of both BW and BI were prototype favorability and past behavior. Finally, order of questions (BW or BI first) was included as a predictor variable in a regression equation including prototype favorability, SC salience, and gender. For BW (but not for BI), there was a prototype by SC salience by gender by question order interaction, $\beta = .13$, $t(214) = 2.34$, $p = .02$; as expected, previously significant slopes (such as males' prototype favorability in the SC salient condition and females' prototype favorability in the SC non-salient condition) became non-significant when BW was second. These exploratory analyses provide support for the idea that responses to one set of questions affects responses to the other (psychological uncertainty principle; Lindsay & Anderson, 2000), and indicates that participants should not be asked to report BW and BI concurrently.

As an exploratory analysis, perceived similarity to the partner was entered into the regressions as a possible mediator. The only analysis in which similarity significantly predicted BW was for the simple slope of BW regressed on prototype favorability for male participants in the experimental condition. Similarity predicted BW, $\beta = .38$, $t(24) = 2.31$, $p = .03$. Prototype favorability still predicted BW, $\beta = .41$, $t(24) = 2.86$, $p = .009$ (although it was down from $\beta = .51$, $t[25] = 3.46$, $p = .002$ when similarity was not included). Lastly, prototype favorability predicted similarity $\beta = .39$, $t[25] = 2.15$, $p = .04$. Thus, for men in the SC salient condition, increasing prototype favorability was associated with increased similarity to the target, which was associated with increased BW to binge drink. This mediated relationship was marginally significant using the computation recommended by Kenny, Kashy, & Bolger (1998), $z = 1.66$, $p < .10$.

Comparison orientation moderation

BW and BI were regressed separately in a gender by prototype by condition by comparison orientation regression. Only the analysis involving BW had any significant interactions, and none involved comparison orientation (see Tables 10 and 11); there were prototype by gender and prototype by SC salient by gender interactions that matched the results presented previously.

Table 10. Interaction of gender, prototype favorability, condition, and comparison orientation for BW to drink heavily

Variable	B	SE	β	<i>t</i>	LB B	UB B
Past Behavior	.42	.07	.51	6.41***	.29	.55
Prototype Favorability	.48	.14	.28	3.52**	.21	.76
SC Salient	.08	.12	.05	.65	-.16	.31
Comparison Orientation	.00	.13	.00	.02	-.26	.27
Gender	-.30	.12	-.18	-2.48*	-.54	.06
Prototype X SC Salient	-.02	.13	-.01	-.13	-.28	.24
Prototype X Comparison Orientation	.18	.15	.09	1.18	-.12	.49
SC salient X Comparison Orientation	-.09	.13	-.05	-.67	-.35	.18
Gender X Comparison Orientation	.05	.13	.03	.37	-.22	.31
Prototype X Gender	-.34	.13	-.20	-2.64**	-.60	-.09
SC Salient X Gender	-.03	.12	-.02	-.27	-.26	.20
Prototype X SC Salient X Comparison Orientation	.14	.15	.07	.92	-.16	.44
Prototype X SC Salient X Gender	-.28	.13	-.16	-2.17*	-.54	-.02
Prototype X Comparison X Gender	-.18	.15	-.09	-1.21	-.49	.12
SC Salient X Comparison X Gender	.23	.14	.13	1.60	-.05	.51
Prototype X SC Salient X Comparison X Gender	-.15	.15	-.07	-.98	-.45	.15

Note. $N = 120$. Total $R^2 = .55$. Values for prototype favorability, and comparison orientation are standardized. Past behavior responses ranged from 1 (*never*) to 7 (*16 or more*) drinking episodes in last 3 months. For condition, SC salient = 1, non-salient = -1. For gender, male = -1, female = 1. LB = lower bound, UB = upper bound of 95% confidence intervals for B.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 11. Interaction of gender, prototype favorability, condition, and comparison orientation for BI to drink heavily

Variable	B	SE	β	<i>t</i>	LB B	UB B
Past Behavior	.60	.08	.63	7.84***	.45	.75
Prototype Favorability	.30	.14	.17	2.09*	.02	.59
SC Salient	.07	.14	.04	.55	-.20	.34
Comparison Orientation	.21	.14	.11	1.51	-.07	.48
Gender	-.08	.14	-.05	-.61	-.35	.19
Prototype X SC Salient	-.05	.14	-.03	-.35	-.32	.22
Prototype X Comparison Orientation	-.15	.16	-.09	-.98	-.46	.16
SC salient X Comparison Orientation	.06	.14	.04	.47	-.21	.33
Gender X Comparison Orientation	.08	.14	.04	.59	-.19	.35
Prototype X Gender	.12	.14	.07	.86	-.15	.39
SC Salient X Gender	-.16	.14	-.09	-1.20	-.43	.11
Prototype X SC Salient X Comparison	-.15	.16	-.09	-.99	-.46	.16
Prototype X SC Salient X Gender	.17	.14	.10	1.29	-.09	.44
Prototype X Comparison X Gender	.20	.16	.11	1.28	-.11	.51
SC Salient X Comparison X Gender	-.04	.14	-.02	-.28	-.31	.24
Prototype X SC Salient X Comparison X Gender	.04	.16	.02	.25	-.27	.35

Note. $N = 105$. Total $R^2 = .54$. Values for prototype favorability, and comparison orientation are standardized. Past behavior responses ranged from 1 (*never*) to 7 (*16 or more*) drinking episodes in last 3 months. For condition, SC salient = 1, non-salient = -1. For gender, male = -1, female = 1. LB = lower bound, UB = upper bound of 95% confidence intervals for B.

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

DISCUSSION

The results of Study 3 provide partial support for the predictions: among men, the relation between prototype favorability and BW was strongest when social comparison was induced. There was no relation, however between prototype favorability and BI for those in either the SC salient or non-salient conditions. This suggests that only willingness to engage in risk taking is affected by social comparison with risk images, as predicted by the P/W model. The mediation evidence suggests that making comparison with the target salient led participants with favorable drinker images to realize that their partner was very similar to themselves. This perceived similarity in turn led to high levels of BW to binge drink. In essence, what may be happening is that men realize that a) their partners are representative of the typical drinker, and b) they are similar to their partners. This dual realization leads to increased comparison and willingness to drink.

Gender differences in risk images

In retrospect, the gender effect in Study 3 might have been anticipated. Gibbons and Gerrard (1995) found a prototype by gender by comparison orientation interaction in analyses of their longitudinal panel of adolescents, such that high comparison males' prototype favorability predicted BW; this finding closely matches the findings in Study 3.

Less intuitive is the finding that men and women responded oppositely in the experimental conditions. Men in the experimental conditions responded as predicted by reporting the strongest relation between prototype and BW, while women responded in the opposite fashion by reporting the strongest relation between prototype and BI and no relation between prototype and BW. Women's responses lack any theoretical coherence: those in the control condition reported a positive relation between prototype and BW, and those in the

experimental condition reported a similar positive relation between prototype and BI. These results are difficult to interpret, but may reflect that women do not view the prototypical drinker as female, so that social comparison with such a prototype may not play much of a role in affecting willingness to drink.

Alcohol use is more normative for men than for women: men are more likely to report binge drinking and being drunk in both high school and college (Johnston et al., 2004; Wechsler & Wuethrich, 2002). But drinking behavior alone cannot account for the gender differences, since the analyses reported above controlled for past binge drinking behavior. Recent evidence shows that, in the past decade, women's drinking styles have changed: among women who consume alcohol, the prevalence of binge drinking behaviors has shown a linear upward trend (Wechsler & Wuethrich, 2002). This is supported by data using the research participation pool from which the present sample was taken; men and women reported little difference in binge drinking rates, with about two-thirds of both men and women reporting binge drinking. This behavior belies the traditional perceptions of binge drinking among young adults as a predominantly male activity. Research in the past has suggested that the social image of adolescent drinkers is stereotypically male (toughness and rebelliousness), and that such an image is less desirable for girls than for boys (Chassin et al., 1985). It is possible, therefore, that perceptions of typical drinkers have not yet caught up to the reality that many more women are now binge drinking. Perhaps, as Gibbons and Gerrard (1995) speculated, the prototypical drinker is perceived as a male, in which case comparison with such an image would be less likely to affect attitudes among women. This may explain the prototype by gender interaction, in which prototypes predicted BW for men only. Such an interpretation is also supported by the cross-sectional survey data presented earlier, in

which roughly half of women reported the typical drinker was males (but only 5% that the typical drinker was female). Gender specificity of the drinker prototype may also account for the finding that similarity only mediated males' prototype favorability and BW. It is less clear why encouraging participants to socially compare would lead to prototype favorability being associated with BI but not BW among women. A first step in understanding these inconsistencies would be to repeat the study including questions to determine if the prototypical drinker is considered to be male, and how similar women perceive themselves to the prototype.

Validity of results

Approximately 10% of the initial sample was excluded due to suspicion that the partner was fictional. Anecdotal evidence collected during debriefing suggests that many of the suspicious students had previously participated in other experiments involving deception, including another study with a fictional partner. Although suspicion was higher than in Studies 1 and 2, suspicious and non-suspicious participants differed little on the primary measures. Although participants responded the same on past behavior, reactions to the fictional partner, and BW/BI to drink, it should be acknowledged that prototype favorability was lower among participants who were excluded from analysis, which may have affected results. Finally, the unanticipated gender effects leave open the possibility that the exploratory analyses involving gender were chance findings. These limitations highlight the need for replication of results as a necessary next step.

GENERAL CONCLUSIONS

In Study 1, participants' favorable responses to the RT prototype measure were related both to favorable attitudes toward a drinking partner and greater willingness to binge drink. The results of Study 2 built on these findings by showing that prototype favorability was related to BW but not BE, and it was related more strongly to BW among those who perceived greater similarity with a drinking target. Finally, Study 3 added to Study 2 by showing that men reported a) stronger relations between prototype favorability and BW when social comparison was made salient than when it was not, and b) no relation between prototype and BI.

Social comparison and social reaction

These studies support the assumption that risk images affect willingness through a social comparison process. This is one of the few experimental tests of the proposed comparison process, and the first that directly studied social comparison rather than relying on indirect measures such as perceived similarity or individual differences in comparison orientation.

The greatest variability in responses in these studies seems to be among those with unfavorable impressions of drinkers: the simple slopes in Study 3 indicate that, among men at least, social comparison combined with unfavorable drinker prototypes led to the lowest reports of BW. Similarly, participants in Study 1 with unfavorable drinker prototypes reported liking the non-drinking partner much more than the drinking partner. What this suggests is that participants are distancing from undesirable images. Blanton et al. (2001) similarly found that willingness to use condoms was affected primarily by negative perceptions of those who did not use condoms; those with negative impressions of non-

condom users reported greater willingness to use condoms than those with relatively favorable impressions of condom users.

The findings in the current study that BW measures were more malleable than BI, interacting with different measures of social comparison (perceived similarity and comparison salience), also support the assumption in the P/W model that BW reflects reactions to situational influences. In contrast, BI was relatively stable and (among men) less affected by variations in social comparison. These findings support the assertion made by Gibbons et al. (2003) that behavioral willingness and behavioral intention are distinct pathways similar to other dual process models of information processing (e.g., Petty & Cacioppo's, 1986, Elaboration Likelihood Model). Individuals may sometimes process information carefully, thoughtfully, and explicitly, leading to stable intentions about risk behavior. Or they may process information in a heuristic or implicit manner, leading to a level of behavioral willingness that can be affected by social situations.

Dual-process models and risk images

Conceptualizing BW as an experiential or non-reasoned pathway in a dual process model suggests two lines of continued research. First, implicit or nonconscious measures are a natural direction for research on the P/W model to take. The current studies provided evidence that RT measures are more sensitive indicators of prototype perception than traditional paper-pencil measures. A truly implicit measure of prototype favorability, modeled after the Implicit Attitudes Test (IAT, Greenwald, McGhee, & Schwarz, 1998), is a possible future direction. As an example, Banse, Seise, and Zerbes (2001) used pictures of same and opposite sex couples as stimulus materials to implicitly measure attitudes toward homosexuality. Similarly, participants could view pictures of individuals in party situations

with either alcoholic or nonalcoholic beverages to implicitly measure BW to drink. It would be predicted that the implicitly activated drinker prototype would be related to greater BW if individuals' prototypes are positive, and less if prototypes are negative. There are two problems with this approach, however. First, risk images as conceptualized by Gibbons and Gerrard are primarily characterological in nature, rather than visual. Students may not have an image of what the typical drinker looks like, but they do have an idea of this person's traits and behaviors. This implicit technique may not accurately capture the drinker prototype, although the pictures would non-consciously activate the drinker category. Second, presence of an alcoholic beverage clearly implies that one is a drinker, but absence of this beverage is less clear. Unlike the method used by Banse et al., where presence of an opposite sex partner indicated heterosexuality, absence of alcohol can mean that the person is a non-drinker or a drinker who does not happen to be drinking at the moment. It would be analogous to using a picture of a person standing alone to indicate heterosexuality. Interpretation of reactions to the non-drinker picture would be problematic, therefore. One solution would be to make it clear somehow that those pictured either are or are not drinkers (Banse et al. similarly told participants they were viewing pictures of romantic couples).

Instead of focusing on visual images, using characterological risk images may be a better approach. In one sense, the current studies primed participants by presenting them with an exemplar of the binge drinking prototype. This could be made more explicit by focusing on priming of traits associated with risk images. One example would be to develop a profile of the prototypical drinker; does the population as a whole tend to view the typical drinker as popular but immature, for example? Next, participants could read about prototypical drinkers that highlight either the positive traits (e.g., popular) or the negative

traits (e.g., immature). Participants could then evaluate a neutral target, to see if priming affected the evaluation of the target, relative to a control condition with no priming. It may be the case that when primed to think about the prototypical drinker, people will tend to categorize ambiguous targets as fitting within that category. Being primed with positive prototype traits could additionally encourage identification with the prototype, increasing BW. Being primed with negative prototype traits, on the other hand, could lead to distancing from the prototype and decreased BW.

The second aspect of dual-process models that lends itself to prototype research revolves around risk images as a form of social categorization. Prototypes are not too dissimilar from stereotypes, and stereotypes have been the subject of significant attention in dual process models (Chaiken & Trope, 1999). For example, Brewer and Feinstein (1999) argue that people tend to form either top-down, category-based impressions of others, or bottom-up, person-based impressions. Brewer and Feinstein differentiate between type of processing (category- or person-based), and level of processing (peripheral or central, borrowed from Petty & Cacciopo, 1986). If processing of information is low effort or peripheral, category-based impressions may lead to reliance on stereotypes. If processing is effortful or central, category-based impressions will be modified by the individual characteristics of the comparison target, which Brewer and Feinstein refer to as individuation. If, on the other hand, processing is based on the person rather than on a social category, there will be no reliance on stereotypes or prototypes, but the focus will instead be on the actual characteristics of the comparison target.

This suggests that prototypes will be effective predictors of risk willingness and behavior only under certain circumstances and for certain people: some situations will invite

social comparison with risk images, and other situations will not. Petty and Cacioppo (1986) found that peripheral processing was more likely when individuals were unable to attend to information, for example when under time pressure or other cognitive loads. Several possible studies could develop out of this melding of social categorization and risk images. It could be predicted, for example, that people are more likely to rely on risk images when reporting their BW under cognitive loads that prevent central processing, therefore leading to greater BW if their prototypes are relatively favorable. Under situations of low cognitive load, on the other hand, individuals would rely less on risk images and more on risk perceptions and past behavior in making decisions, thereby using a reasoned action approach. There are probably also individual differences in the extent to which prototypes are relied upon. Petty and Wegener (1999) report that greater need for cognition, an individual difference in people's desire to think, leads to more effortful processing of information. People low in need for cognition, therefore, would be more likely to be guided by risk images and the social reaction pathway than people high in need for cognition. The next step in studying prototypes and the P/W model is to explore how risk images relate to dual-process models of social categorization.

Image subtypes

One difficulty with prototype research is that the drinker images appear to be idiosyncratic. Although there is agreement that heavy drinkers are not viewed very favorably, there is little evidence for a generally shared stereotype about what drinkers are like. Instead, people probably have their own personal images of what specific traits typical drinkers have. One possibility is to create a two-session study, with session one devoted to assessing participants' idiosyncratic prototypes, and session two devoted to using participants

own prototypes as stimuli.

Another possibility is that, although a general drinker prototype is not widely shared, a family of commonly held images or subtypes exists. People may agree to some extent that there are several kinds of drinkers; e.g., the partier, the chronic alcoholic, etc., who share commonly accepted traits. The extent to which these subtypes exist and are distinctive is an empirical question, but it is reasonable to assume that a behavior as common as drinking would generate several different prototypes. By more specifically matching individuals' personal images, these prototypes might prove to be better predictors of behavioral willingness and actual behavior.

Binge drinking prevention

Support for the assumption that people socially compare with risk images to determine the acceptability of risk behavior suggests two possible avenues for intervention. One possibility is that educators can attempt to change the composition and favorability of young adults' risk images, to therefore decrease willingness to drink and actual drinking behavior. Heavy drinking is associated with a variety of negative outcomes (e.g., memory loss, unplanned sex, injury; Wechsler, Davenport, Dowdall, Hoeykens, & Castillo, 1994); that fact, coupled with the fairly negative impressions most people already have of the prototype, may be used to show people that the typical drinker is not a person worth emulating. Gibbons et al. (2003) and Gerrard et al. (2002) suggested that encouraging negative impressions of typical drinkers would be an effective approach, but to date there is no published research for this type of intervention. This intervention could function similarly to Schroeder and Prentice's (1998) pluralistic ignorance study, in which students who were presented with accurate information about their peers' negative attitudes about alcohol use

reported drinking less when surveyed 4-6 months later. Similarly, students could be presented with the negative perceptions people have about those who drink. Prototypes appear to develop out of experience with exemplars that represent that experience (Homa, Sterling, & Trepel, 1981; Homa & Vosburgh, 1976), however, so interventions that emphasized the negative aspects of heavy drinkers would need to occur in childhood and early adolescence before prototypes are well-established, and to recur periodically. Given that drinking is normative for adolescents and young adults, who will encounter many real-life drinking exemplars, it may be difficult to sustain an extremely negative prototype over the long-term.

An alternate approach is to focus on social comparison as the target of interventions. People tend to view the typical non-drinker as a goal state, and non-drinker prototypes have been shown to predict abstention from alcohol (Gerrard et al., 2002). This suggests that encouraging young adults to compare themselves with the typical non-drinker may lead to decreases in drinking. In discussing upward and downward comparison, Buunk and Ybema (1997) argue that people are usually motivated to identify with people who are doing better (an upward comparison) and to contrast with those who are doing worse (a downward comparison). For example, Ybema and Buunk (1995) found that when disabled individuals were presented with interviews of others coping well with disability, they reported more positive affect if they also perceived control over their situations. Ybema and Buunk argued that the perception of control led to identification with these upward comparison targets. A relatively straightforward intervention would be to encourage participants to repeatedly consider ways they are similar to the typical non-drinker and dissimilar to the typical drinker, and to emphasize that they have control over the decision to drink or not drink. Given that

the non-drinker prototype is not associated with BW (Gerrard et al., 2002), an emphasis on planfulness and choice in both comparison targets and drinking decisions may be fruitful.

Gerrard et al. (2002) argued that people engage in a form of prototype matching with the non-drinker prototype, in which participants assess the amount of overlap between their self-image and the non-drinker image. The non-drinker is a goal state, and this matching does not occur with the more unfavorable drinker image. Because the typical non-drinker is perceived so favorably, people may be prone to socially compare with non-drinkers. Furthermore, non-drinkers do enjoy tangible benefits over drinkers, because drinking is associated with adverse consequences such as missed work and unplanned sex. This serves to reinforce the favorable view most already have of non-drinkers. Therefore, individuals with significant drinking experience may be able to recognize through personal experience the positive aspects of not drinking, and of the non-drinker prototype. The key will be whether the advantages in thinking of oneself as a non-drinker outweigh the positive expectancies surrounding drinking and the normative pressure to engage in a behavior that is exceedingly common among young adults. An alternate prototype target that is more moderate than the non-drinker prototype is the typical social drinker, someone who drinks occasionally but not to excess. This prototype, to the extent that it exists, encompasses the positive features of the non-drinker image while being more attainable in a social environment where alcohol is prevalent.

There are similarities between how researchers believe social comparison operates and drinking patterns among young adults. Findings that those depressed or low in self esteem tend to engage in downward comparisons (Gibbons, 1986; Wood, Giordano-Beech, Taylor, Michela, & Gaus, 1994) suggest that negative affect can lead to comparison

strategies that can put health at risk. Teen-aged drinkers appear to have greater negative affect (Tapert et al., 2003; Crowe, Philbin, Richards, & Crawford, 1998; Wills, Duhamel, & Vaccaro, 1995). Negative cognitions may encourage comparison with downward prototype targets, which can lead to a downward spiral of increased drinking and identification with other problem drinkers, similar to the academic spiral reported in Gibbons, Blanton, Gerrard, Buunk, and Eggleston (2000). In that study, students who performed poorly during their first semester tended to lower their comparison level, indicating a preference for comparing with other poor-performing students. This “downward shift” in comparison led to a subsequent decline in academic performance. Among depressed drinkers, identification with unfavorable drinker prototypes may similarly lead to increased drinking (akin to worsening academic performance), which in turn leads to negative consequences that only heighten the depression.

Conclusion

The present research has shown how social comparison with risk images leads to willingness to binge drink. In the process, it has provided support for the Prototype/Willingness Model’s basic assumption that young adults engage in social comparison with their own mental representations, and this comparison helps explain why young adults are often willing to engage in unhealthy behaviors. This research also highlights that prototype perception is a form of social comparison. Just as people look to other people for cues on how to act and think, they also “look” to their own mental representations about different types of people. This suggests that social comparison occurs not just with risk images, but with all kinds of images. Image comparisons could affect not just decisions to drink, but all sorts of decisions including choices about college attendance,

career aspirations, even romantic partners. Just as prototype research has increased our understanding of risk behaviors, it could likewise help us to understand many other important behaviors.

Now think about the typical person your age who frequently gets drunk (for example, at parties). Once again, we are interested in what traits you think this type of person is likely to have (in other words, what most people in this group are like). Use the following scale for each item and write the number on the line to the left of the descriptor:

1	2	3	4	5	6	7
Not at all					Extremely	
_____						45. Popular
_____						46. Dull (boring)
_____						47. Fun loving
_____						48. Confused
_____						49. Lazy
_____						50. Smart
_____						51. Considerate
_____						52. Self-centered
_____						53. Depressed
_____						54. "Cool"
_____						55. Optimistic
_____						56. Immature
_____						57. Self-confident
_____						58. Take risks
_____						59. Independent
_____						60. Lose temper
_____						61. Careless
_____						62. Unattractive
_____						63. Conservative
_____						64. Like adventure
_____						65. Rebellious
_____						66. Outgoing

Planning Report

Please read the following planning report and provide input by completing the attached questions.

Planned Social Event

Iowa State University has received funding from an external grant agency to enhance the quality of student social life on campus. With this funding, students and administrators are planning a new campus-wide event starting next semester called What's On Wednesdays. WOW (as it will be known) is an attempt to provide high-quality social events to students and encourage use of campus facilities, especially the Memorial Union. It will consist of the following parts:

- 1) Food and Refreshments: Free or low-cost food and nonalcoholic beverages will be provided from 6-8 PM in the Memorial Union. For the first few Wednesdays, free pizza and pop will be provided. Eventually, it is anticipated that students, residence halls, and department groups will sponsor a given Wednesday and provide refreshments.
- 2) Entertainment: Every Wednesday, a different form of entertainment will be provided, in conjunction with the Student Activities Center and the Student Union Board. For example, this may include films, comedians, pool tournaments, or concerts. The WOW planning committee will also solicit ideas from student and department groups.
- 3) Group meetings: Student and department groups will be encouraged to hold their meetings on Wednesdays. This will bring more students to campus in the early evening hours, with the idea that before or after their meetings they could enjoy the food and entertainment.

As WOW gets established it is anticipated that activities will expand beyond the Memorial Union and involve the residence halls and Rec Center. The goal is to make the ISU campus a preferred destination for students who want to socialize in the evening hours during the week. Market research estimates attendance will average approximately 400 students during the first semester, and will increase 20-25% per semester for the next 3-4 years.

Evaluation of Social Event

Please think carefully about the event described in the planning report, and give us your honest opinion of the pros and cons of this event.

1) What do you like about this event?

2) What do you dislike about this event?

3) What activities would you like to see at this event?

4) What is your evaluation of the likelihood of success of this event?

P# _____

Lab Session Questionnaire II

Before you start working with your partner, we would like some basic information from you. Please answer the following questions.

1. How carefully did you read the planning report and answer the evaluation questions?

1	2	3	4	5	6	7
Not at all carefully						Very carefully

2. How carefully do you think your partner read the planning report and answered the evaluation questions?

1	2	3	4	5	6	7
Not at all carefully						Very carefully

3. How easy do you think it will be work with your partner?

1	2	3	4	5	6	7
Very difficult						Very easy

4. How much do you think you will like your partner?

1	2	3	4	5	6	7
Dislike extremely			Neither like nor dislike			Like extremely

5. Based on his/her answers on the evaluation report, what do you know about your partner so far?

We are gathering attitudes about What's on Wednesday from a variety of sources. In order to determine the potential for success of this program, we need some basic information about students' recreation and entertainment preferences. Please answer the following questions about your recreation interests.

Suppose that there were several different activities being offered on campus on the same night that you and your friends were looking for something to do. How willing would you be to do each of the following? (circle the number that best reflects your attitude)

6. Go to the Union to hear a comedian.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

7. Play in an intramural volleyball tournament.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

8. Go to the Maintenance Shop to hear live music.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

Suppose that there was a movie at the Union that you really wanted to see. However, some of your friends wanted to stay in and watch a video. How willing would you be to do each of the following? (circle a number that best reflects your attitude)

9. Stay and watch the video with your friends.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

10. Try to convince your friends to go to the movie.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

11. Find someone else to go to the movie.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

12. Go to the movie by yourself.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

Suppose that you are at a party with some friends. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a very attractive man/woman you had been wanting to meet asks you to stay and offers to get you another drink. How willing would you be to do each of the following? (circle a number that best reflects your attitude)

13. Stay and have one more drink.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

14. Stay and continue to drink (more than one drink).

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

15. Stay, but not drink any more.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

16. Say you need to leave, but ask if you can call him/her sometime.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

APPENDIX B: STUDY 2 MATERIALS

Lab Session Questionnaire I

Please think about the typical ISU student. We are not suggesting that they are all alike. Rather, we are interested in what traits you think this type of person is likely to have (in other words, what most people in this group are like). Use the following scale for each item and write the number on the line to the left of the descriptor:

1	2	3	4	5	6	7
Not at all						Extremely
_____						_____ 1. Popular
						_____ 2. Dull (boring)
_____						_____ 3. Fun loving
						_____ 4. Confused
_____						_____ 5. Lazy
						_____ 6. Smart
_____						_____ 7. Considerate
						_____ 8. Self-centered
_____						_____ 9. Depressed
						_____ 10. "Cool"
_____						_____ 11. Optimistic
						_____ 12. Immature
_____						_____ 13. Self-confident
						_____ 14. Takes risks
_____						_____ 15. Independent
						_____ 16. Loses temper
_____						_____ 17. Careless
						_____ 18. Unattractive
_____						_____ 19. Conservative
						_____ 20. Likes adventure
_____						_____ 21. Rebellious
						_____ 22. Outgoing

Lab Session Questionnaire I (continued)

Please think about the typical person your age who drinks alcohol regularly. Think about what type of person he or she is like. Once again, we are not suggesting that people who do this are all like, but we want to know what you think most people in this group are like. Use the following scale for each item and write the number on the line to the left of the descriptor:

1	2	3	4	5	6	7
Not at all						Extremely
_____						_____ 23. Popular
_____						_____ 24. Dull (boring)
_____						_____ 25. Fun loving
_____						_____ 26. Confused
_____						_____ 27. Lazy
_____						_____ 28. Smart
_____						_____ 29. Considerate
_____						_____ 30. Self-centered
_____						_____ 31. Depressed
_____						_____ 32. "Cool"
_____						_____ 33. Optimistic
_____						_____ 34. Immature
_____						_____ 35. Self-confident
_____						_____ 36. Take risks
_____						_____ 37. Independent
_____						_____ 38. Lose temper
_____						_____ 39. Careless
_____						_____ 40. Unattractive
_____						_____ 41. Conservative
_____						_____ 42. Like adventure
_____						_____ 43. Rebellious
_____						_____ 44. Outgoing

PLEASE SIGNAL THE EXPERIMENTER NOW.

We are interested in getting some basic information about you. Although your identity will remain anonymous, your partner will see your responses if you are in the Partner Decision Condition.

17. Gender (check one) M F

18. Age _____

19. On average, how often have you gone to the Memorial Union this academic year? (check one)

Every day.

More than once a week.

Once or twice a week.

Less than once per week, but more than once a month.

Once a month or less.

Never been to the Memorial Union.

20. Are you currently involved in any student groups?
(check one) Yes No

If yes, which ones?

21. Are you currently involved in any athletics?
(check one) Yes No

If yes, which ones?

22. How often do you eat out (at restaurants, fast food, etc.)

In order for us to get a better understanding of the types of things ISU students like to do on weeknights, please tell a short story about something you did last Thursday night.

How typical was this evening for you? (circle one)

1	2	3	4	5	6	7
Not at all typical (never done before)			Somewhat typical (do this sometimes)			Very typical (frequently do this)

Questionnaire

Before you start working with your partner, we would like to get your impression of your partner, and some basic information about you. Please answer the following questions.

23. How carefully did you read the planning report and answer the evaluation questions?

1	2	3	4	5	6	7
Not at all carefully						Very carefully

24. How carefully did you read your partner's information?

1	2	3	4	5	6	7
Not at all carefully						Very carefully

25. How much do you and your partner agree about Thursdays on Campus?

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

26. How easy do you think it will be work with your partner?

1	2	3	4	5	6	7
Very difficult			Neither easy nor difficult			Very easy

27. How similar do you think you are to your partner?

1	2	3	4	5	6	7
Very different			Neither similar nor different			Very similar

28. How much do you and your partner share the same attitudes about school?

1	2	3	4	5	6	7
Very different			Neither similar nor different			Very similar

29. How much do you and your partner share the same attitudes about socializing?

1	2	3	4	5	6	7
Very different			Neither similar nor different			Very similar

30. How much do you think you will like your partner?

1	2	3	4	5	6	7
Dislike extremely			Neither like nor dislike			Like extremely

We are gathering attitudes about Thursdays on Campus from a variety of sources. In order to determine the potential for success of this program, we need some basic information about students' recreation and entertainment preferences. Please answer the following questions about your recreation interests.

Suppose that there were several different activities being offered on campus on the same night that you and your friends were looking for something to do. How willing would you be to do each of the following? (circle the number that best reflects your attitude)

31. Go to the Union to hear a comedian.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

32. Play in an intramural volleyball tournament.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

33. Go to the Maintenance Shop to hear live music.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

Suppose that there was a movie at the Union that you really wanted to see. However, some of your friends wanted to stay in and watch a video. How willing would you be to do each of the following? (circle a number that best reflects your attitude)

34. Stay and watch the video with your friends.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

35. Try to convince your friends to go to the movie.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

36. Find someone else to go to the movie.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

37. Go to the movie by yourself.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

Suppose that you are at a party with some friends. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a very attractive man/woman you had been wanting to meet asks you to stay and offers to get you another drink. How willing would you be to do each of the following? (circle a number that best reflects your attitude)

38. Stay and have one more drink.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

39. Stay and continue to drink (more than one drink).

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

40. Stay, but not drink any more.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

41. Say you need to leave, but ask if you can call him/her sometime.

1	2	3	4	5	6	7
Not at all willing			Maybe			Very willing

42. How likely is it that you will go see a comedian at the Union in the next year?

1	2	3	4	5	6	7
Not at all likely			Maybe			Very likely

43. How likely is it that you will play intramural sports in the next year?

1	2	3	4	5	6	7
Not at all likely			Maybe			Very likely

44. How likely is it that you will have too much to drink (get drunk) in the next year?

1	2	3	4	5	6	7
Not at all likely			Maybe			Very likely

45. How likely is it that you will watch a movie at home in the next year?

1	2	3	4	5	6	7
Not at all likely			Maybe			Very likely

46. How likely is it that you will go to a movie at the Union in the next year?

1	2	3	4	5	6	7
Not at all likely			Maybe			Very likely

APPENDIX C: STUDY 3 MATERIALS

Mass-testing Questions

Past Behavior

47. Using the scale below, please indicate how many times you have had a whole drink of alcohol (for example, a bottle of beer or a whole mixed drink) during the last 3 months:

A	B	C	D	E	F	G
Never	Once	2 - 3	4 - 5	6 - 10	11 - 15	16 or more

48. Using the scale below, please indicate how many times you have had more than 4 drinks in a single drinking episode during the last 3 months:

A	B	C	D	E	F	G
Never	Once	2 - 3	4 - 5	6 - 10	11 - 15	16 or more

Social Comparison

This scale assesses comparison behaviors. Some of the questions may sound similar, but please answer each one. Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly 'good' or 'bad' about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do this we would like you to indicate how much you agree with each statement below, by using the following scale.

A	B	C	D	E
I disagree strongly		Neither agree nor disagree		I agree strongly

49. I often compare myself with others with respect to what I have accomplished in life.
50. If I want to learn more about something I try to find out what others think about it.
51. I always pay a lot of attention to how I do things compared with how others do things.
52. I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing.
53. I always like to know what others in a similar situation would do.
54. I am not the type of person who compares often with others.
55. If I want to find out how well I've done something, I compare what I have done with how others have done.
56. I often try to find out what others think who face similar problems as I face.
57. I often like to talk with others about mutual opinions and experiences.
58. I never consider my situation in life relative to that of other people.
59. I often compare how I am doing socially (e.g., social skills, popularity) with other people.

Experimental Session Measures (on PC)

Prototype

Please think about the type of person your age who frequently gets drunk (for example, at parties). 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). Do the following words describe your image of that person? Use this scale to give a response to each.

1	2
No	Yes

- 60. smart
- 61. confused
- 62. popular
- 63. immature
- 64. "cool" (sophisticated)
- 65. self-confident
- 66. independent
- 67. careless
- 68. unattractive
- 69. dull
- 70. considerate
- 71. self-centered

Behavioral Willingness (BW)

Suppose that you are at a party. After several drinks you are beginning to feel that you may have had enough, and you are getting ready to leave. Then a friend you haven't seen for a while shows up late to the party and offers to get you another drink. How willing would you be to do each of the following?

A	B	C	D	E	F	G
Not at all willing			Maybe			Very willing

- 72. Stay and have one more drink.
- 73. Stay and continue to drink (more than one drink).
- 74. Stay, but not drink any more.
- 75. Say you need to leave, but tell your friend you will call him/her.

Behavioral Intention (BI)

76. Do you intend to drink a lot in the next 3 months?

A	B	C	D	E	F	G
Definitely Not			Maybe			Definitely Yes

77. Do you intend to get drunk in the next 3 months?

A	B	C	D	E	F	G
Definitely Not			Maybe			Definitely Yes

78. Are you planning to drink a lot in the next 3 months?

A	B	C	D	E	F	G
Definitely Not			Maybe			Definitely Not

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