Blame for past behavior versus threat to future freedom: reaction to anti-binge drinking messages

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Blame for past behavior versus threat to future freedom:

Reaction to anti-binge drinking messages

By

Monica Joy Reis-Bergan

A dissertation submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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This is to certify that the Doctoral dissertation of

Monica Joy Reis-Bergan

has met the dissertation requirements of Iowa State University.
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INTRODUCTION

Many prevention programs aimed at reducing binge drinking among college students have yielded disappointing results (Bangert-Drowns, 1988; Nathan, 1983; Wechsler & Isaac, 1992). One possible reason for the lackluster performance of traditional interventions is that these efforts are often based on the assumption that the college binge drinker is a rational, unbiased, and interested listener. Interventions based on this rational approach focus on informing college students about the dangers of alcohol and instructing them not to drink. It is assumed that college students will listen to the information presented, learn it, and act accordingly. The past behavior of the student is seldom considered. Rather, he or she is given a directive concerning future behavior. The explicit message states drinking alcohol is dangerous, so do not drink. In cases where the recipient of the message has already started drinking, however, the message has an important added implicit component -your past behavior has been unwise.

Reactance

Research suggests that drinking alcohol is very important to many students. They seek out situations conducive to alcohol consumption and thus are active participants in their drinking decisions (Wechsler, Dowdall, Davenport, & Castillo, 1995). As a result, students may believe that drinking is an important freedom and therefore be especially vigilant about threats to this freedom. If that is the case, then messages that explicitly tell college students to change their drinking patterns may be counterproductive because they arouse psychological reactance.
According to reactance theory, when an individual's freedom to engage in a valued behavior is threatened or eliminated, the individual will become motivationally aroused (Brehm, 1966; Brehm & Brehm, 1981). This arousal, or reactance, leads to attempts to re-establish the threatened or lost freedom. In other words, the person is motivated to feel "that he can do what he wants, that he does not have to do what he doesn't want, and that at least in regard to the freedom in question, he is the sole director of his own behavior" (Brehm, 1966, p. 9). The more important the freedom is to the individual, the greater the reactance.

Historically, reactance studies have examined the freedom to choose one desirable object over another (Hammock & Brehm, 1966), to choose one behavior over another (Jones, 1970; Worchel & Brehm, 1971), or to hold a specific attitude (Brehm & Brehm, 1966; Snyder & Wicklund, 1976). The majority of the research has examined issues related to consumer behaviors (e.g., buying records) and opinion change (e.g., endorsing political candidates). For example, Mr. Smith is pondering over the selections on a restaurant menu when he is informed by the waitress that the kitchen may have run out of vegetable soup. Such a threat to this particular freedom (eating vegetable soup) should create psychological reactance. As a result, Mr. Smith should tend to become increasingly interested in vegetable soup, which means he will be more likely to order it in the future.

Relatively little research has explored reactance in the context of health behavior (Raps, Peterson, Jonas, & Seligman, 1982; Rezek & Leary, 1991; Taylor, 1979). Moreover, although frequently discussed as a framework for interpreting results, studies examining health behaviors rarely manipulate reactance.
One exception to this trend is a study by Bensley and Wu (1991) that explored reactance to alcohol education. Participants in the study were given a five-paragraph summary of the alcohol prevention materials used in the popular press. In the final paragraph, participants encountered either a message directly instructing them to adhere to the recommendations made in the summary (high-reactance) or a message urging participants to consider the points made in the summary (low-reactance). As expected, those participants who read the high-reactance message reported stronger intentions to drink compared to those in the low-reactance condition. Thus, the anti-drinking messages resulted in a "boomerang" effect: participants reported intentions to increase their alcohol consumption instead of the desired outcome of decreased intentions to drink.

The Bensley and Wu (1991) messages also included an element of blame for past drinking. In the high-reactance condition, participants were told that "Any reasonable person must acknowledge" that drinking is bad. Thus, it is difficult to determine whether the "boomerang" effect was due to the reactance manipulation or the blame component of the message. Because many educational interventions are directed at populations that have already experimented with the behavior being targeted, it is important to determine if the "boomerang" effect is the result of an implied and/or perceived negative evaluation of past behavior, or a reduction in perceived freedom to engage in future behavior, or both.

Although most health messages aimed at individuals already engaging in the risk behavior have an element of both blame for previous behavior and threat to freedom to engage in future behavior, it is possible to separate them. For example, if an individual is pulled over by a police officer for speeding, the officer can berate the driver for his/her
reckless risky behavior or simply discount the speeding as a temporary lapse in judgment. Similarly, the officer could deliver a strong message demanding a change in future behavior or merely encourage responsible driving. The ensuing cognitions and behavior of the driver are of considerable interest. Under what conditions does the driver increase or decrease his or her intention to speed in the future? The primary goal of the current study was to examine this question as it relates to alcohol consumption by college students. Specifically, two components of anti-binge drinking messages were investigated orthogonally: blame for previous excessive consumption and threat to personal freedom to continue the behavior. A secondary goal of the study was to examine the role of self-esteem in defensive responses to anti-binge drinking messages.

Self-esteem

It has been proposed that having a positive evaluation of the self is beneficial in many ways. People with high self-esteem appear to be happier, more capable of caring relationships, more persistent and effective in obtaining goals, and to have a greater capacity for intellectual and creative work than those with low self-esteem (see Taylor & Brown, 1988). However, the benefits of high self-esteem may not extend to health behaviors. A number of studies have suggested that high self-esteem individuals are more inclined to employ self-serving cognitive biases than are low self-esteem individuals (Fiske & Taylor, 1991; Taylor & Brown, 1988). For example, individuals with high self-esteem are more likely than are individuals with low self-esteem to see negative feedback as less credible than positive feedback (Shrauger, 1975), and minimize the importance of situations in which they are not competent (Campbell, 1986). Thus, the rose-colored glasses that
allow the person with high self-esteem to smile, persist, and create, may also bias interpretations of negative information. For example, Jane is convinced that smoking is not harmful. She discounts information she sees on TV and in the newspaper that suggests that cigarettes are addictive. Such cognitive distortions may foster positive mental health while creating a false sense of security about the dangers associated with health risk behaviors.

It has been suggested that individuals with high self-esteem will experience greater levels of reactance than will those with low self-esteem (Brockner et al., 1983). Evidence for this claim comes from research indicating that people who expect to be "in control" and competent to make their own decisions experience more reactance than do people who do not expect to be "in control" or do not perceive themselves to be competent to make their own decisions (Wortman & Brehm, 1975). Compared to individuals with low self-esteem, individuals with high self-esteem report both higher perceived control and higher competence, characteristics of people who are prone to experience reactance (Dweck, 1975; Robinson & Shaver, 1973; Shrauger, 1972). Empirically, individuals with high self-esteem have been shown to exhibit more reactance than individuals with low self-esteem in regards to attitude change and task performance (Brockner & Elkind, 1986; Brockner et al., 1983). Thus, the individual with high self-esteem who makes a choice to engage in a risky behavior (e.g., smoking) is not only likely to be more adept at distorting negative information about the behavior, but also may experience more reactance if the choice to engage in the behavior is threatened. For example, if Jane has high self-esteem, she is unlikely to decrease the number of cigarettes she smokes when confronted with messages that remind her that smoking is dangerous because these messages are perceived to threaten
her freedom to smoke. Thus, such messages may even increase her desire to smoke and
frequency of smoking. Consistent with this reasoning, recent research suggests that self-
esteeem moderates the relation between health risk behaviors and defensive health
cognitions. More specifically, these studies have demonstrated that making the riskiness of
past behavior salient is more likely to have undesirable effects on the recall of information,
perceptions of vulnerability, and behavioral willingness of individuals with high self-esteem
than those with low self-esteem.

Recall of Information

Gerrard, Kurylo, and Reis (1991) presented college women with accurate
contraception and AIDS information as part of a class on human reproduction. All
participants completed a pre-test at the beginning of the course. The authors found that,
among college students with a negative orientation toward sexual material (erotophobia),
individuals with high self-esteem were less likely than those with low self-esteem to retain
contraceptive and AIDS information. In other words, students with high self-esteem did
not learn the information that suggested that their current behavior was risky.

Perceptions of Vulnerability

In general, perceptions of vulnerability motivate precautionary behavior. Evidence
of this effect has been documented for a wide variety of health behaviors including blood
pressure screenings and immunizations (Gene, Espinola, Cabezas & Boix, 1992; Winkleby,
examined the relation between self-esteem and perceived vulnerability to unplanned
pregnancy. The first study demonstrated that self-esteem moderates the influence of review
of sexual and contraceptive behaviors on women’s perceptions of vulnerability to unplanned pregnancy. Specifically, although women with high and low self-esteem reported similar past risky sexual behavior, only those with low self-esteem increased their perceptions of vulnerability after reviewing their (relatively risky) behavior. A second longitudinal study found that women with high self-esteem were less likely than women with low self-esteem to increase their perceptions of vulnerability as their risk behavior increased over time.

Finally, Gibbons, Eggleston, and Benthin (1995) found that individuals with high self-esteem who were threatened (by failing to quit smoking after making a public commitment to abstain) reacted in a more defensive manner than did individuals with low self-esteem. Specifically, relapers with high self-esteem, but not relapers with low self-esteem, lowered their estimation of the health risks associated with smoking. Moreover, these lowered perceived risks were associated with less commitment to future smoking cessation efforts.

**Intentions, Willingness, and Prototypes**

A recently developed model of adolescent health risk behavior, the Prototype/Willingness (P/W) model, proposes that there are two pathways to behavior (Gibbons & Gerrard, 1995, 1997, 2000). One pathway, labeled the “reasoned pathway” is similar to the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and represents logical, deliberative decision-making. Intentions, defined as conscious plans to perform or not perform a specified behavior, represent the final product of the “reasoned” pathway to behavior (Ajzen & Fishbein, 1977).
The second route to behavior, labeled the "social reaction" pathway, emphasizes social factors relevant to risk decisions. The two focal constructs of this pathway are prototypes or images, and behavioral willingness. Willingness reflects an individual's openness to opportunity, i.e., his or her willingness to perform a certain behavior in circumstances conducive to that behavior. It is assumed that people often do have an idea of how they might react in risky situations, even though they have no intention of seeking out these situations. Relative to intention, willingness involves little contemplation of the behavior and even less consideration of its consequences.

The prototype is defined as "the type of person who engages in or actually typifies, the behavior" (Gibbons, Gerrard, & Boney-McCoy, 1995). Numerous studies have demonstrated that people are influenced by their perceptions of the type of person who engages in risk behavior (Burton, Sussman, Hansen, Johnson, & Flay, 1989; Chassin, Presson, Sherman, McLaughlin, & Gioia, 1985; Gibbons & Gerrard, 1995). According to the P/W model, the relation between risk images and behavior is mediated by willingness. The more acceptable the prototype is perceived to be, the more willing the individual is to engage in the behavior given the opportunity.

In a test of the P/W model, Eggleston (1996) examined the relation between self-esteem and cognitive antecedents to sexual risk behavior. In this study, the primary dependent variables were the prototype of the typical person who has casual sex, willingness to engage in casual sex, and intentions to have casual sex. Specifically, Iowa State University undergraduate women were presented with a message describing the prevalence of sexual behaviors of other Iowa State University women. The prevalence
information was designed to correct misperceptions that risky sexual behaviors were 
common and that most college students did not use condoms. The information presentation 
had the strongest effect on women who had previously engaged in high-risk sexual behavior 
(e.g., multiple sexual partners, sex without condoms). Specifically, high risk individuals 
with high self-esteem reported increased favorability of the casual sex prototype and 
increased willingness to have casual sex following the prevalence message. On the other 
hand, high risk individuals with low self-esteem responded by decreasing their favorability 
of the casual sex prototype and decreasing their willingness to have casual sex. There were 
no significant differences found concerning change in intentions to use condoms or 
intentions to engage in causal sex. As expected, the presentation of social information 
(prevalence) resulted in more change in the constructs included in the social reaction 
pathway of the Prototype / Willingness model than it did in intention, a construct related to 
reasoned decision making processes.

In the studies reviewed, individuals were informed with either implicit or explicit 
messages that their past behaviors were unwise and that they should change their behavior 
in the future. In general, individuals with high self-esteem, more so than individuals with 
low self-esteem, justified their risky behavior by either not adjusting their health cognitions 
or increasing their favorability of the risky choice. None of these studies, however, 
examined the possibility that the implicit messages given to the participants concerning 
their past behavior played an important role in subsequent defensive reactions or self-
justifying health cognitions.
The current study examined the impact of message characteristics on health cognitions (e.g., perceived vulnerability, willingness, intentions) related to binge drinking. The primary goal of the study was to investigate two components of anti-binge drinking messages: blame for previous excessive consumption and threat to personal freedom to engage in future binge drinking behavior. Thus, the type of message conveyed to participants was manipulated in two ways. The first manipulation involved the amount of blame directed at participants for their past binge drinking. The second manipulation concerned the amount of threat to personal freedom included in the recommendation directed at participants about their future alcohol use. A secondary goal of the study was to examine self-esteem as a moderator of the relation between the message manipulations and health cognitions.

Overview of the Current Study

The design was a 2 blame for past behavior (blame vs. no blame) x 2 threat to future freedom message (low vs. high) with self-esteem treated as a continuous independent variable. All of the participants reported engaging in a recent binge-drinking episode. In order to emphasize the health risks associated with binge drinking and allow for a believable no blame manipulation, participants underwent a medical test that indicated that they would be especially at risk for liver damage if they engaged in binge drinking. The focal dependent variables were willingness to binge drink and intentions to binge drink in the future. Additional health cognitions related to the behavior and health outcome were also assessed. Specifically, perceived favorability of the binge drinker prototype,
perceived prevalence of binge drinking, perceived severity of liver damage, and perceived vulnerability to liver damage were examined.

**Predictions**

In general, the dependent variables were expected to act in concert with one another. Defensive responses and reactance to the message would be characterized by some combination of the following responses: high willingness and intention to engage in binge drinking, favorable perceptions of the binge drinker, high perceived prevalence of binge drinking, low perceived severity of liver damage, and low perceived vulnerability to liver damage. On the other hand, low willingness and intention to binge drink, unfavorable perception of the prototype of the binge drinker, low perceived prevalence of binge drinking, high perceived severity of liver damage, and high perceived vulnerability to liver damage, would suggest nondefensive/nonreactive responses.

It was hypothesized that self-esteem would moderate the relation between message characteristics and health cognitions related to binge drinking. Three separate interactions were predicted. First, because individuals with high self-esteem see themselves as competent, the message that their current behavior is unwise should create defensiveness regarding that behavior. Thus, self-esteem was hypothesized to interact with the blame manipulation such that individuals with high self-esteem who received a blame message were predicted to react more defensively than either participants with low self-esteem or participants with high self-esteem who receive a no blame message. Second, self-esteem was expected to interact with the threat manipulation such that individuals with high self-esteem were predicted to react defensively when threat to personal freedom was high.
When presented with a low threat message to change their behavior, both low self-esteem and high self-esteem participants were expected to respond in a compliant manner.

These two way interactions were predicted to be qualified by a three-way interaction. The blame plus threat condition was expected to arouse more defensiveness in individuals with high self-esteem than in those with low self-esteem. Thus, the strongest defensive reaction was hypothesized among high self-esteem individuals who perceive that they were being blamed for their previous (unwise) consumption, and that their freedom to drink as they choose was being threatened. It was predicted that the high self-esteem individuals would respond with extreme defensiveness when confronted with a threat to character and a threat to personal freedom.

In addition, it was predicted that the blame manipulation should yield a stronger main effect among constructs of the "social reaction" pathway, willingness and prototype, than the construct of the "reasoned" pathway, intentions. Because willingness and prototype reflect social factors and reactive responses to risk behaviors, the blame manipulation, a statement of social approval or disapproval, should be especially influential. On the other hand, because intention reflects deliberative consideration of the behavior, the manipulation aimed at future decision making should experience the strongest effect on future planning. Thus, the threat to freedom manipulation should yield a stronger main effect for intention than either willingness or prototype. Gender effects were not predicted.
METHOD

Participants

Participants were 88 male and 88 female undergraduate college students who completed pre-selection materials in mass-testing sessions given by the Department of Psychology at Iowa State University at the beginning of the Spring 1999 semester. Because the study was concerned with blame for past behavior, one criterion for inclusion in the study was recent binge drinking behavior. All participants reported having engaged in binge drinking (5 or more alcoholic drinks in a single drinking episode) at least four times in the last four to five months. Six men and two women were excluded from the analyses because they indicated suspicion about the procedures or were skeptical of the cover story. Thus, the final sample consisted of 82 men and 86 women.

Overview

The procedure consisted of 6 phases and is similar to the Thioamine Acetalyce (TAA) enzyme paradigm first used by Jemmott, Ditto, and Croyle (1986). This paradigm allows researchers to manipulate perceptions of health status by giving participants information concerning the presence or absence of a bogus enzyme that influences their susceptibility to a variety of medical ailments. In the current study, the enzyme was called the Pyrintease (PT) enzyme. Phase 1 of the experimental session involved giving participants information about the PT enzyme. During Phase 2, participants read a brief information sheet and then proceeded with a saliva reaction assessment to “test” for the enzyme. All of the participants were told that they had the PT enzyme, which in conjunction with the consumption of more than four alcoholic drinks at one sitting, would
cause damage to the liver. Phase 3 involved administration of the two manipulations, blame for past behavior (blame/no blame) and the threat to freedom of choice (low/high). Both manipulations were presented verbally and in written form. The primary dependent variables were given in questionnaire format in Phase 4. Phase 5 involved an experimental feedback form that included manipulation checks. Finally, participants were debriefed in Phase 6. A summary of the six phases of the study is presented in Table 1.

Materials and Procedure

Pre-selection

Participants' self-esteem and drinking history were assessed in mass-testing sessions held early in the spring semester. First, participants completed the Rosenberg Self-Esteem Inventory (1965), which consisted of 10 items that measure general feelings of self-worth, e.g., “I think I am a person of worth, at least on an equal level with others;” “I am able to do things as well as most people;” “On the whole, I am satisfied with myself.” Ratings were made on a 7-point Likert Scale (endpoints 1 = strongly disagree and 7 = strongly agree; \( \alpha = .89 \)). Second, drinking status was assessed with a single item that asked participants how many times in the last four to five months they had had more than four alcoholic drinks at one drinking episode (see Appendix A). Only those students who reported frequent binge drinking (four or more times in the last four to five months) were called and invited to participate in the study.

Phase 1

When participants arrived at the lab they were given a brief introduction, an informed consent form to read and sign, and a medical history form that assessed the
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occurrence of several medical conditions in their immediate family (see Appendix B).

After completion of these materials, participants were told about the PT enzyme. Specifically, participants were told that the study was funded by the National Institute of Alcoholism and Alcohol Abuse, which was accurate, and that it involved examining two things: how the results of an actual screening test are best conveyed to a large population and how those results affect subsequent psychological states and health beliefs. When the introduction was completed, participants were shown to their individual rooms to self-administer the saliva reaction test for the PT enzyme.

Phase 2

In each participant's room there was a sheet that provided general information about the PT enzyme and instructions on how to administer the test (See Appendix C). Each participant was instructed to dab the test strip (a common litmus paper) on his/her tongue so that it would absorb some saliva. Participants were told that if the test strip turned pink upon contact with saliva, they did not have the enzyme. If however, the test strip turned a blue-green color they have tested positive and the PT enzyme was present in their body. In reality, the test paper turned blue-green immediately after contact with saliva for all participants. Therefore, all participants thought they tested positive for the enzyme. In order to check that the participants read and understood their test results, they were asked to report their results on a lab card.

Phase 3

After completing the PT enzyme saliva reaction test, participants notified the experimenter of their results. The experimenter then initialed the lab card validating their
test results. At this point, the participants were randomly assigned to blame (blame/no blame) and threat (low/high) conditions. The first manipulation focused on how the participant should interpret his/her past behavior. In the high blame condition, the participant was told: “Although this enzyme has just been recently discovered, we have known for some time that heavy drinking is very dangerous. Detection of the PT enzyme presents a new awareness of the health threat; nonetheless you should have already been well aware that heavy drinking is a well-known problem behavior.” In the no blame condition the experimenter told the participant “Because the enzyme was just discovered, you had no way of knowing whether the enzyme existed, let alone whether you have it or not. So you really can’t be blamed for previous behavior that may have put you at risk” (see Appendix D).

The second manipulation concerned the threat to freedom to binge drink in the future. Specifically, in the high threat condition, the participants were told: “It is essential that you limit your consumption whenever you drink. You must never drink more than 4 drinks in an evening.” In the low threat condition, participants were told: “We suggest that you limit your consumption when you drink. At the same time, we realize that you are an adult and that you make your own decisions-- weighing the positives and negatives of each situation and deciding for yourself what is best. We simply ask that you keep our recommendation in mind when making decisions about alcohol use” (see Appendix E).

After receiving the message manipulations from the experimenter, the participants were instructed to read a brochure that explained the consequences of a positive test result. The manipulations that had been administered verbally by the experimenter were
summarized again in the brochure. Participants were instructed to complete a brief questionnaire when they were finished reading the brochure. Specifically, participants were asked to rate how they felt using 12 adjectives. Ratings were made on a 9-point Likert Scale (endpoints not at all and extremely). Negative mood was assessed with the adjectives irritated, angry, worried, depressed, confused, and disgusted (α = .83); positive mood included the adjectives happy, optimistic, carefree, satisfied, relieved, and calm (α = .83).

Phase 4

Phase 4 involved completing the primary dependent variables questionnaire. Participants were asked if they intended to drink more than 4 drinks in one sitting in the next 3 months. Ratings were made on a 7-point Likert scale with endpoints of definitely no and definitely yes. Willingness to binge drink was assessed by having participants rate how willing they would be to engage in excessive drinking (more than 4 drinks) in a variety of situations: when they were sad or upset, happy and wanted to celebrate, socializing with a friend, or given a drink without asking (7-point Likert scale with endpoints not at all willing and very willing). The responses from each situation were averaged to form a willingness index (6 items, α = .90). Participants were also asked to rate their image of the typical binge drinker in terms of six adjectives (smart, confused, immature, cool, self-confident, and careless), each accompanied by a 7-point scale, with endpoints not at all and extremely (Gibbons & Gerrard, 1995). The 6-item version of the prototype was used instead of the traditional 12-item version due to time constraints in the experimental session. The reliability of the prototype was acceptable (α = .72). Estimates of the
prevalence of binge drinking were also measured. Participants were asked to estimate the percent of Iowa State University students who drink more than four drinks at one drinking episode. Perceived severity of liver damage was assessed by having participants make a slash on a 120 mm line with endpoints of not at all dangerous and very dangerous. Perceived vulnerability to liver damage was measured by asking participants the likelihood that they would experience mild/moderate liver damage. Ratings were made on a 7-point Likert scale with endpoints of not at all likely and extremely likely (see Appendix F).

**Phase 5**

After participants completed the questionnaires, the experimenter explained that the funding agency requested information about the current study. This form served as the manipulation check. Participants rated how guilty and how bad (i.e., regretful) the study made them feel about their past behavior (1 = definitely no to 9 = definitely yes). In addition, participants were asked how much pressure they felt to comply with the experimenter's recommendations about drinking (1 = no pressure to 9 = a lot of pressure) and how forceful they thought the study was in directing their future drinking behavior (1 = not at all forceful to 9 = very forceful). Participants were instructed to fold this final questionnaire and seal it in an envelope addressed to a fictitious person at the National Institute of Alcoholism and Alcohol Abuse.

**Phase 6**

When the participants were finished they were told that the purpose of the study was to assess how people respond to different types of messages aimed at reducing binge drinking. The experimenter described the different types of messages utilized in the study.
They were also informed that the PT enzyme was fictitious and they were shown a litmus strip and told how it was altered to look like test paper and that everyone tested positive (see Appendix G).
RESULTS

The results are presented in four sections. The first section includes analyses of the manipulation checks. The second section presents results assessing the affective responses to the binge drinking messages. Analyses examining intention and willingness are presented in the third section. Finally, the analyses concerning the remaining dependent variables, prototype, prevalence, perceived severity, and perceived vulnerability are presented. Correlations and descriptive statistics for all variables are presented in Table 2.

Hierarchical multiple regression analyses were conducted to examine the effects of the two message manipulations, self-esteem, and gender on the dependent variables. Step one included the blame manipulation, the threat manipulation, gender, and self-esteem. Step two included all the two-way interactions. The three-way interactions were entered in step three and step four included the four-way interaction of blame by threat by self-esteem by gender. In addition, self-esteem was dichotomized using a median split (Mdn = 57) and analyses of variance (ANOVAS) were conducted. Both sets of analyses yielded identical results. For simplicity of presentation, results from the ANOVAS are presented instead of the regressions.

Manipulation Checks

Two types of responses to the messages were examined: emotional responses and perceptions of coercion. Overall, the manipulations did not work as expected. The means and standard deviations of the manipulation checks by condition are presented in Table 3. The first two questions assessed participants' emotional reactions to the information presented. When asked about feelings of guilt for past behavior, participants in the blame
Table 2. Means, standard deviations, and correlations for all variables.

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<td>.12</td>
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<td>.18</td>
<td>.12</td>
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<td>15. Perceived Severity</td>
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<td>.15</td>
<td>.00</td>
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<td>-.02</td>
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<td>.24</td>
<td>.26</td>
<td>.22</td>
<td>.02</td>
<td>.13</td>
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</tbody>
</table>

Means: 0.49 0.51 54.46 1.51 2.57 4.49 4.98 5.5 3.68 4.24 3.95 3.33 3.54 64.05 8.12 3.45

Standard Deviations: 0.50 0.50 10.49 0.50 1.90 2.26 2.23 2.11 1.28 1.47 2.06 1.50 0.86 17.40 1.83 1.41

Note. Correlations > .15 significant at p < .05
condition reported higher perceptions of guilt than did participants in the no blame condition \( (F(1, 152) = 4.03, p < .05, M_s = 2.91 \text{ and } 2.32, \text{ respectively}) \). In addition, participants given the high threat message reported more guilt than participants given the low threat message \( (F(1, 152) = 7.17, p < .01, M_s = 3.00 \text{ and } 2.23, \text{ respectively}) \). All other main effects and interactions were nonsignificant \( (\text{all } F_s(1, 152) < 2.13, p > .15) \).

The second question concerned the extent to which participants felt "bad (i.e., regretful)" about their past drinking behavior. No main effects or interactions were found \( (\text{all } F_s(1, 152) < 2.36, p > .13) \). Thus, it appears that both manipulations affected perceptions of guilt, but not feelings of regret. The correlation between feeling guilty and feeling bad (regret) was nonsignificant \( (r = .06) \).

The next two manipulation checks examined perceptions of coercion. When asked to indicate how much pressure they felt to comply with experimenters' recommendations, participants in the high threat condition reported higher levels of pressure than did participants in the low threat condition \( (F(1, 152) = 5.78, p < .02, M_s = 5.42 \text{ and } 4.59, \text{ respectively}) \). All other main effects and interactions were nonsignificant \( (\text{all } F_s(1, 152) < 2.46, p > .12) \). The second measure examined participants' perceptions of force employed by the experimenter in directing future alcohol use. The analysis yielded a significant gender main effect; females reported higher perceptions of force than did males \( (F(1, 152) = 4.82, p = .03, M_s = 5.85 \text{ and } 5.13, \text{ respectively}) \). All other main effects and interactions were nonsignificant \( (\text{all } F_s(1, 152) < 2.02, p > .16) \). As expected, the threat to freedom manipulation resulted in more perceived pressure to comply with the experimenter, however, it was not significant for perceived force.
Table 3. Means and standard deviations of manipulation checks by message condition.

<table>
<thead>
<tr>
<th></th>
<th>Low Threat</th>
<th></th>
<th>High Threat</th>
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<tbody>
<tr>
<td></td>
<td>No Blame</td>
<td>Blame</td>
<td>No Blame</td>
<td>Blame</td>
</tr>
<tr>
<td>Feel Guilt</td>
<td>1.80 (1.99)</td>
<td>2.47 (1.54)</td>
<td>2.78 (2.21)</td>
<td>3.19 (2.19)</td>
</tr>
<tr>
<td>Feel Bad</td>
<td>4.31 (2.22)</td>
<td>4.39 (2.49)</td>
<td>4.39 (1.98)</td>
<td>4.61 (2.32)</td>
</tr>
<tr>
<td>Feel Pressure</td>
<td>4.24 (1.99)</td>
<td>4.81 (2.08)</td>
<td>5.61 (2.20)</td>
<td>5.26 (2.43)</td>
</tr>
<tr>
<td>Perceive Force</td>
<td>5.02 (2.07)</td>
<td>5.39 (2.07)</td>
<td>5.81 (1.98)</td>
<td>5.76 (2.25)</td>
</tr>
</tbody>
</table>

Note: Cell size 40-44, Scale 1 - 9.

Mood Responses

The analysis examining positive mood did not result in any significant main effects or interactions (all F_s(1,152) < 2.25, ps > .14). The negative mood analysis however, did yield a significant three-way Blame x Threat x Gender interaction (see Table 4). In order to further understand the interaction, additional analyses were conducted examining males and females separately. The analysis including only males did not yield any significant main effects or interactions (all F_s(1,152) < 2.60, ps > .11.). The women’s responses, however, produced an interesting interaction. The Blame x Threat interaction was significant (F(1, 81) = 4.45, p < .05). The pattern of means was such that when given a high threat message, the blame manipulation did not impact negative mood (t < .88). However, among women in the low threat condition, those who also received the blame message reported higher levels of negative mood than did those women who were
not blamed for their past behavior \( t(38) = 2.05, p < .05 \). Even though the correlation between positive and negative mood was significant \( r = -.38 \), the manipulations were more influential in responses to negative adjectives.

Table 4. Means and standard deviations for the blame by threat by gender interaction predicting negative mood.

<table>
<thead>
<tr>
<th>Low Threat</th>
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<tr>
<td>No Blame</td>
<td>Blame</td>
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<tr>
<td>No Blame</td>
<td>Blame</td>
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<tr>
<td>Males</td>
<td>Males</td>
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<tr>
<td>4.28 (1.63)</td>
<td>4.38 (1.15)</td>
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<tr>
<td>3.75 (1.47)</td>
<td>4.76 (1.79)</td>
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<tr>
<td>Females</td>
<td>Females</td>
</tr>
<tr>
<td>3.52 (1.51)</td>
<td>4.41 (1.10)</td>
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<tr>
<td>4.59 (1.25)</td>
<td>4.24 (1.40)</td>
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</table>

Willingness and Intention

The results of the analysis predicting intention yielded a significant main effect for the threat manipulation \( F(1, 152) = 11.08, p < .01 \). Participants who received the high threat message reported lower intentions to binge drink than did those who received the low threat message \( (M_s = 3.54 \) and \( 4.46 \) respectively). The main effect for the blame manipulation, however, was not significant \( (\text{no blame}) M = 3.80 \) and \( \text{[blame]} M = 4.10 \). Gender was a significant predictor of intention such that males reported higher intentions to binge drink than did females \( F(1, 152) = 17.19, p < .001, M_s = 4.69 \) and \( 3.42 \), respectively). All other interactions and main effects were nonsignificant \( (\text{all } F_s(1, 152) < 2.42, ps > .12) \).
The analysis examining willingness also yielded a significant main effect for the threat manipulation ($F(1, 152) = 5.06, p < .03$), such that participants in the high threat condition reported lower willingness to binge drink than did participants in the low threat condition ($M_s = 3.12$ and $3.56$, respectively). Similar to the results examining intention, men reported higher willingness to binge drink than did women ($F(1, 152) = 21.80, p < .001, M_s = 3.92$ and $2.92$, respectively). Moreover, there was a significant main effect for self-esteem such that individuals with high self-esteem reported higher willingness to binge drink than did individuals with low self-esteem ($F(1, 152) = 4.29, p < .05, M_s = 3.65$ and $3.20$, respectively). However, these effects were qualified by the significant four-way interaction of Gender x Self-esteem x Blame x Threat ($F(1, 152) = 8.18, p < .01$). Separate analyses were conducted on males and females to clarify the pattern of this interaction.

Analysis of the males' data did not yield any significant main effects or interactions (all $F_s(1,74) < 2.95, ps > .09$). The results for females, however, resulted in a number of significant main effects and interactions. Women in the high threat condition reported lower willingness to binge drink than did women in the low threat condition ($F(1, 78) = 8.82, p < .01, M_s = 2.51$ and $3.33$, respectively). In addition, women with low self-esteem reported lower willingness to binge drink than did women with high self-esteem ($F(1, 78) = 5.53, p < .05, M_s = 2.60$ and $3.25$, respectively). These effects were qualified by the significant Blame x Threat x Self-esteem three-way interaction. In order to further simplify the results and explore the conditions that foster defensiveness, the sample was divided by high and low self-esteem. The analysis examining women with low self-
esteem yielded a significant main effect for the threat manipulation ($F(1, 39) = 4.30, p < .05$), such that among women with low self-esteem, those in the high threat condition reported lower willingness to binge drink than those in the low threat condition ($Ms = 2.20$ and $2.98$, respectively). The analysis examining women with high self-esteem resulted in a significant main effect for threat ($F(1, 39) = 4.51, p < .05$, high threat $M = 2.81$ and low threat $M = 3.68$). This effect was qualified, however, by a significant Blame x Threat interaction ($F(1, 39) = 8.58, p < .01$). As can be seen in Table 5, women who were first blamed for their past behavior and then given only a suggestion to change their future behavior (low threat) reported the highest willingness to binge drink.

Table 5. Means and standard deviations for the blame by threat interaction predicting willingness for women with high self-esteem.

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<th>No Blame</th>
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<tbody>
<tr>
<td>Low Threat</td>
<td>$2.78^a (1.29)$</td>
<td>$4.58^b (1.21)$</td>
</tr>
<tr>
<td>High Threat</td>
<td>$3.11^a (1.26)$</td>
<td>$2.51^a (1.23)$</td>
</tr>
</tbody>
</table>

Note. Means with different superscripts are different at $p < .05$.

Although this pattern was not as expected, post-hoc analyses were conducted to determine if negative mood mediated the defensive response. When the negative mood composite was entered as a covariate into the equation, the two-way Blame x Threat interaction remained significant ($F(1, 39) = 4.35, p < .05$). However, when the anger...
adjective alone was entered as a covariate, the interaction dropped to marginal significance \((F(1, 39) = 2.85, p = .10)\). The correlation between anger and willingness was significant \((r = .34, p < .05)\). An additional analysis examining anger responses as a dependent variable among high self-esteem women yielded a significant Blame x Threat interaction \((F(1, 39) = 15.91, p < .01, \text{see Table 6})\). The results suggest that the anger felt by women with high self-esteem mediated the relation between the message manipulations and willingness to binge drink.

Table 6. Means and standard deviations for the blame by threat interaction predicting anger for women with high self-esteem.

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<tbody>
<tr>
<td>Low Threat</td>
<td>2.12\text{a} (1.35)</td>
<td>4.50\text{c} (1.38)</td>
</tr>
<tr>
<td>High Threat</td>
<td>4.67\text{c} (1.94)</td>
<td>3.17\text{b} (1.75)</td>
</tr>
</tbody>
</table>

Note. Means with different superscripts are different at \(p < .05\).

Prototype, Prevalence, Perceived Severity, Perceived Vulnerability

Analyses examining the remaining dependent variables resulted in primarily nonsignificant results (for means and standard deviations of all dependent variables see Table 7). Men reported more favorable perceptions of the prototype of the typical binge drinker than did women \((F(1,152 = 9.96, p < .01, Ms = 3.74 \text{ and } 3.35, \text{respectively})\). Likewise, men reported lower perceived severity of liver damage than did women.
\[ F(1, 152) = 3.90, p = .05, M_s = 7.85 \text{ and } 8.35, \text{ respectively}. \] All other main effects and interactions were nonsignificant (all \( F(1, 152) < 2.59, p > .11 \)).

Table 7. Means and standard deviations of dependent variables by message condition.

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<td>No Blame</td>
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</tr>
<tr>
<td>Intention</td>
<td>4.27 (1.84)</td>
<td>4.69 (1.94)</td>
<td>3.29 (2.07)</td>
<td>3.65 (2.16)</td>
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<td>(Scale 1-7)</td>
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<tr>
<td>Willingness</td>
<td>3.31 (1.34)</td>
<td>3.87 (1.45)</td>
<td>3.00 (1.48)</td>
<td>3.23 (1.64)</td>
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<tr>
<td>(Scale 1-7)</td>
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<tr>
<td>Prototype</td>
<td>3.50 (0.92)</td>
<td>3.42 (0.83)</td>
<td>3.63 (0.91)</td>
<td>3.61 (0.80)</td>
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<td>(Scale 1-7)</td>
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<tr>
<td>Prevalence</td>
<td>63.38 (15.52)</td>
<td>60.44 (17.79)</td>
<td>66.51 (17.11)</td>
<td>65.35 (16.49)</td>
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<td>(Scale 0-100)</td>
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<tr>
<td>Perceived Severity</td>
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<td>8.23 (1.87)</td>
<td>7.85 (1.96)</td>
<td>8.20 (1.89)</td>
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<td>of Liver Disease</td>
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<td>(Scale 0-12)</td>
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<tr>
<td>Perceived Vulnerable</td>
<td>3.38 (1.35)</td>
<td>3.61 (1.38)</td>
<td>3.20 (1.44)</td>
<td>3.63 (1.48)</td>
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<tr>
<td>to Liver Disease</td>
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<td>(Scale 1-7)</td>
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DISCUSSION

The overall results of the study provide some support for the idea that evaluation of past behavior and recommendations concerning future behavior influence cognitions related to subsequent risk behavior. Participants who were demanded to change their behavior (high threat) reported lower intentions to binge drink than did participants who were just encouraged to change their behavior (low threat). The threat message also had a strong main effect on women’s reported willingness to binge drink. Women who received the high threat message indicated lower willingness to binge drink than did women who received the low threat message. Among women with high self-esteem, this main effect was qualified by a Blame x Threat interaction. A strong defensive reaction was noted by women with high self-esteem who were blamed for their past behavior and then given the suggestion that they change that behavior (low threat). Post-hoc analyses indicated that perceived anger mediated the relation between the messages presented and willingness to drink.

Analyses examining the dependent variables, prototype, prevalence, perceived severity of liver damage, and perceived vulnerability to liver damage, did not yield the predicted results. Rather the results indicated strong gender main effects for some of the variables. Males reported higher favorability of the binge drinker prototype and lower perceived severity of liver damage than did women. No gender differences were found, however, for perceived prevalence of binge drinking and perceived vulnerability to liver damage.
Gender was not expected to be an influential predictor variable in the current study because research on gender differences in alcohol use has resulted in more similarities between the sexes than differences (Colder & Stice, 1988; Windle & Barnes, 1988). Although actual alcohol use may not be significantly different among men and women, researchers have speculated that men may feel more pressure to accept and engage in alcohol consumption than women (Perkins, 1992; Prentice & Miller, 1993). The current study provided mixed results concerning gender differences in health cognitions. In addition to the results discussed above, males reported higher intentions to drink and higher willingness to binge drink than did women. Moreover, it is unclear why the manipulations had a significant impact on reports of willingness for females and not for males. Future research is needed to address cognitive antecedents and situational factors related to binge drinking among males and females.

**Theoretical Implications**

**Reactance Theory**

Earlier research examining reactance did not attempt to distinguish the influence of blame for past behavior and threat to future freedom. However, it is plausible to think that blame for past behavior or restriction imposed on future behavior or both might cause an attempt to re-establish the threatened or lost freedom. Although the current study was designed to further understand the mechanisms involved in reactive responding the results are not clear. The only evidence of reactance was found among women with high self-esteem who were blamed for their past behavior and then given the suggestion to change their behavior. More research examining these two types of messages separately is
necessary to conclude that blame or restriction or both cause individuals to experience reactance.

**Prototype / Willingness Model**

The Prototype / Willingness model proposes that there are two antecedents to risk behavior: willingness and intention. The results of the current study were consistent with the notion that threats to freedom will influence behavioral intentions. However, the threat manipulation also affected participants' willingness to binge drink. The expected influence of the blame manipulation on willingness was found among women with high self-esteem. The differential pattern of results among intentions and willingness is striking considering the strong correlation between intention and willingness ($r = .79$). It is clear that for most individuals, what they intend to do is what they are willing to do. Under certain circumstances, however, assessing willingness affords the opportunity to examine reactive decision making in action. For women with high self-esteem, for example, there was evidence of defensive responding in that their willingness was highest in the blame/low threat condition. Consistent with the premise that willingness is reactive and not deliberative, anger experienced after presentation of the messages mediated this response. It appears that the combination of being blamed for past behavior and receiving a weak suggestion to change that behavior angered these high self-esteem women and was associated with higher willingness to binge drink. Given the situational nature of willingness, a person could be influenced by their affective state (angry) and report how they might respond in a given situation. This affective state, however, is not likely to modify deliberative cognitions related to the behavior (intentions).
Self-esteem

A secondary goal of the paper was to examine self-esteem as a moderator of the relation between message characteristics and health cognitions related to binge drinking. There was support for the hypothesis that self-esteem influenced the relation between message content and willingness responses. These interactions were not, however, in the direction predicted. Instead of revealing the strongest defensive reaction in the blame and demand cell, the strongest evidence of reactant responding occurred among female participants with high self-esteem who were blamed for their past behavior and then given the suggestion to change. It was probably shortsighted to assume that individuals with high self-esteem would react defensively following a serious medical test that indicates they have an enzyme that results in liver damage. The rose-colored glasses so capable of blurring minor defects and negative feedback would not likely do that well with information derived from apparently objective medical data (Taylor & Brown, 1988).

Limitations

In order to explore the influence of past behavior evaluation on future behavior cognition, an effort was made to create a situation in which participants could truly believe they were not experiencing any kind of blame for previous behavior. The TAA paradigm was used, in part, because presenting participants with a newly discovered medical test would result in a situation in which they could essentially be absolved of blame related to past behavior--participants were not aware of the danger before and, therefore, could not be held responsible for their past actions. The TAA paradigm was used in conjunction with binge drinking because I was interested in investigating a health behavior that was
important to the participants as well as engaged in frequently. In hindsight, I think the procedure itself was much more impactful than either message manipulation. Several women cried, one man pounded his fists on the desk so hard that the experimenter could hear him in the control room. One female participant tried to call her mother on her cell phone from the research cubicle. Strong reactions also occurred in the debriefing process when the truth was gradually revealed. Many participants jumped to their feet and showed signs of complete shock. Most participants demonstrated reactions of relief when they finally realized they did not have an enzyme problem. Given that the message manipulations occurred after the enzyme test, it is possible that informing these binge drinkers that they had an enzyme that could result in liver scarring had such a strong impact that it overwhelmed these manipulations. Therefore, one reason for the weak manipulation effects and unexpected patterns of results could be the strength of the procedure. Different results might have been obtained if the manipulations were given before the enzyme test or if the test were not included in the study.

Another possible limitation of the study was the behavior patterns of the participants selected. It was assumed that people who engage in frequent binge drinking plan to do so and find their freedom to drink important. However, in debriefing, many participants reported a history of not planning to binge drink, but rather, losing control and drinking too much. Therefore, for participants genuinely motivated to binge drink the messages might have triggered reactance. However, for the group of participants who felt that their drinking behavior was out of their control the blame message would have been negated by a self-absolution (i.e., “I cannot control it therefore I am not responsible.”) and the threat
message would be ignored. Future research examining only intentional binge drinkers or examining these message characteristics with a behavior that is clearly controllable (e.g., reckless driving) might yield results different from those found in the current study.

Future Directions

Health message campaigns aimed at changing behavior are present in all forms of the media. There are public service announcements on television implying that using drugs is unwise, as well as radio ads presenting the hacking cough of the lifelong smoker. For individuals currently engaging in these risk behaviors, the messages blame them for their previous unwise behavior and demand behavior change. Future research should continue to examine the influence of these messages separately. Two modifications of the current study might yield interesting results concerning the differential impact of the two messages. Eliminating the enzyme test would most likely have a strong impact on the results. It is probable that the objective medical information overwhelmed the message manipulations. Another change would be to examine the responses of only those individuals who perceive that the risk behavior is under their own personal control. The two messages, blame for past behavior and threat to behavioral choice, are likely to have more of an impact on individuals who believe they are in control of their drinking behavior compared to those who believe their drinking is uncontrollable.

Conclusions

The results of the current study suggest that researchers carefully consider the implicit and explicit messages contained in presentations designed to change behavior. The current study provided evidence (albeit minimal) that evaluations of past behavior and
recommendations for future behavior influence college students' cognitions about binge drinking. More research is necessary to identify conditions that are likely to result in appropriate (compliant) and defensive cognitions concerning behavior change. Discovering the characteristics of messages that result in compliant responses and decreased behavior will prove useful from both a theoretical and an applied perspective.
APPENDIX A: MASS-TESTING SCREENING QUESTIONS

Past Behaviors

Using the 5-point scale below, please indicate how often you have had more than 4 drinks in a single drinking episode during the last 4 - 5 months:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Once</td>
<td>2 or 3 times</td>
<td>4 or 5 times</td>
<td>More than 5 times</td>
</tr>
</tbody>
</table>

Self-Esteem

Below are several statements about how you feel about yourself. Please read each statement carefully. Indicate how much you agree with each statement by filling in the appropriate letter on your bubble sheet. Use any of the numbers on this scale:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

1. I feel that I'm a person of worth, at least on an equal level with (equal to) others.
2. I feel that I have a number of good qualities.
3. All in all, I'm inclined to feel that I'm a failure.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times, I think I am no good at all.
Please indicate if there is a history of the following health conditions in your immediate family. (Check Yes or No)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td></td>
<td></td>
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<tr>
<td>Clinical Depression</td>
<td></td>
<td></td>
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<tr>
<td>Hepatitis</td>
<td></td>
<td></td>
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<tr>
<td>Liver Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Specify type: ________________________)

Below is a list of 6 common health problems. We would like to know which of these health problems you have experienced in the last 6 months. Please use the following scale when answering these items:

1 = I have NOT experienced this in the last 6 months.
2 = I have experienced this ONCE or Twice in the last 6 months.
3 = I have experienced this THREE times in the last 6 months.
4 = I have experienced this FOUR or MORE times in the last 6 months

_____ a. Cold
_____ b. Flu
_____ c. Strep throat
_____ d. Headaches/Migraines
_____ e. Stomach problems
_____ f. Lower back problems
Pyrintease Enzyme Saliva Reaction Test

What is the pyrintease enzyme?

The pyrintease enzyme was recently discovered by a group of medical researchers. This enzyme was isolated in March 1996 after 2 years of testing. The discovery of different enzymes is not uncommon in medical research. To date, more than 700 different enzymes have been discovered.

The pyrintease (PT) enzyme, however, is a very unusual enzyme. The occurrence of the enzyme is relatively uncommon compared to other enzymes and also acts differently when synthesized in the liver. This process produces a large amount of heat and is very taxing on the liver.

The liver is also responsible for detoxifying and transforming toxins. Alcohol is one of the most destructive elements the liver has to detoxify. Because the liver is already under stress synthesizing PT, any additional burden in detoxifying alcohol can lead to inflammation and liver damage. This overload in the liver begins to occur after an individual has consumed about 4 drinks in one sitting.

How do I find out if I have the enzyme?

If present in the body, the PT enzyme can be found in the saliva and blood. Endocrinologists have demonstrated that while present in some individuals, the enzyme seems to be totally lacking in others. If the PT enzyme is present in the body, it can be detected in saliva with a chemically coated paper that was developed recently.

Instructions to self-administer the PT saliva reaction test:

1. Apply the tester to your tongue, making sure to get plenty of saliva on the yellow test paper.
2. The results of the test will immediately appear.
3. Record the results on the available card according to the test results information given below.
4. Flip the red switch and await further instructions from the experimenter.

Reading the test results:

- IF THE SAMPLE SQUARE TURNS A PINKISH RED THEN YOU HAVE TESTED NEGATIVE FOR THE PT ENZYME.

- IF THE SAMPLE SQUARE TURNS A BLUISH GREEN THEN YOU HAVE TESTED POSITIVE FOR THE PT ENZYME.
APPENDIX D: VERBAL BLAME/NO BLAME MANIPULATIONS

BLAME

I want to take a few minutes to discuss with you the consequences of the test and what it means. Do you have any concerns? First of all, knowing that you have the enzyme is very important information for you to have. Everything I am going to say is described in this brochure. Please read it carefully. Before you read it however, I want to emphasize that although this enzyme has just been recently discovered, we have known for some time that heavy drinking is very dangerous. Detection of the PT enzyme presents a new awareness of the health threat; nonetheless, you should have already been well aware that heavy drinking is a well-known problem behavior.

NO BLAME

I want to take a few minutes to discuss with you the consequences of the test and what it means. Do you have any questions? Everything I am going to say is described in this brochure. First of all, knowing that you have the enzyme is very important information for you to have. However, I want to emphasize that because the enzyme was just recently discovered, you had no way of knowing whether the enzyme existed, let alone whether you have it or not. So you really can't be blamed for any past behavior that may have put you at risk.
APPENDIX E: VERBAL HIGH/LOW THREAT MANIPULATIONS

High Threat Condition

Because of your test results, it is essential that you limit your consumption whenever you drink. You must never drink more than 4 alcoholic drinks in an evening. This brochure describes the consequences of a positive test result and gives valuable information about the liver. When you have finished reading it, please complete this PT test personal information sheet and flip the red switch by the door.

Low Threat Condition

We suggest that you limit your consumption when you drink to fewer than 5 alcoholic drinks at one sitting. At the same time we realize that you are an adult and that you make your own decisions—weighing the positives and negatives of each situation and deciding for yourself what is best. We simply ask that you keep our recommendation in mind when making decisions about alcohol use. This brochure describes the consequences of a positive test result and gives valuable information about the liver. When you have finished reading it, please complete this PT test personal information sheet and flip the red switch by the door.
APPENDIX F: HEALTH COGNITION QUESTIONNAIRE

We would now like to ask you some questions about your drinking behavior. It is essential that you answer each question as honestly as you can.

Do you intend to drink more than 4 drinks in one sitting in the next 3 months?

1 2 3 4 5
Definitely no Definitely yes

Please take a minute and try to imagine yourself in the following fairly common situations. Again, we ask that you answer as honestly as possible.

Suppose you were feeling really sad or upset. How willing would you be to do each of the following?

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

_____ a. Have more than 4 drinks

Suppose you just received great news and wanted to celebrate. How willing would you be to do each of the following?

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

_____ a. Have more than 4 drinks
Suppose you were at a party with some friends and you and they had been drinking. Over the course of a couple of hours, you’ve had 4 drinks and you realize you’ve probably had enough. Then a friend, who is drinking, comes up and sits down to talk. You must decide whether to drink some more or not. In this situation, how willing would you be to do each of the following?

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

_____ a. Have just one more drink.

_____ b. Have a couple more drinks.

_____ c. Keep drinking, not worrying about how many you have consumed.

Suppose you had been drinking for a couple of hours and you have already had four drinks then someone buys you a drink without asking. How willing would you be to do the following?

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

_____ a. Go ahead and drink it.
We would like you to think for a minute about the type of person your age who binge drinks (more than 4 drinks in one sitting). We are not interested in any one in particular, just the typical binge drinker. How much do you think each of the following words describes your image of that person? Use the following 7 point scale for each item.

1 2 3 4 5 6 7
Not at all Extremely

_____ smart
_____ confused
_____ immature
_____ "cool" (sophisticated)
_____ self-confident
_____ careless

What percent of ISU students do you think drink more than 4 drinks at one drinking episode?

____________ %

How dangerous to health do you consider liver damage? Please make a slash on each line.

Not at all dangerous Very dangerous

Please rate the likelihood that you will experience mild/moderate liver damage

1 2 3 4 5 6 7
Not at all likely Extremely likely
APPENDIX G: DEBRIEFING

EXP: Are you finished? *(Take the form and place in their folder)*. Okay, follow me back to another room *(Participants are showed into another lab room for the debriefing)*. Now that each of you has completed the saliva-test and questionnaire. As you know, this study was about people's reactions to receiving diagnostic health information. More specifically, it was designed to study how people feel about their alcohol consumption depending on type of message delivered by the experimenter. Previous research has shown that people's intentions to decrease their alcohol consumption can be influenced by the strength of the suggestion that they limit their intake. Very forceful suggestions sometimes lead people to actually increase their consumption.

In this experiment some participants were told that they should not feel bad if they had previously consumed more than 4-5 drinks at one sitting, and others were told that they should feel bad about such behavior. Some were given very forceful messages that they should limit the number of drinks they consume at a single sitting to 3-4, and others were told that they should consider limiting their intake. We are interested in how these factors effect participant's intentions to drink, their perceptions of the danger of alcohol, and their perceptions of the prevalence of heavy drinking among college students.

In order to make this manipulation impactful, we had to ensure that all participants thought that drinking more than 4-5 drinks at one time was dangerous. This was accomplished by having each of you conduct the PT saliva reaction test. We had to ensure that all of the participants would receive positive test results (the enzyme was present). In fact, the test strip changed color only because there is acid present in your saliva. Everyone's test strip changed because the it was simply a section cut from a typical litmus strip *(show regular strip and lick strip to show results)*.
The brochures explained that the test strip detected the PT enzyme, but really it only detected the acid in your saliva. In fact, the PT enzyme is really bogus, **no such enzyme exists**. We told you that each of you had the enzyme so that we could measure your psychological reactions to being given a positive diagnostic result that put you at risk if you drank more than 4-5 alcoholic beverages in one sitting. So in truth, the Pyrintease enzyme does not exist, and thus the information about excessive liver damage associated with detoxifying alcohol and synthesizing the PT enzyme was made up for this study. **Not only is the enzyme fictitious, but all the information you received about past and future liver damage associated with the enzyme was also false.**

We want to tell you however, that all the information we gave you about the importance of your liver is true. The liver is one of the most important organs in your body and while we made up the PT enzyme, heavy drinking over prolonged periods of time does cause irreparable damage to the liver.

Many times in psychological studies when we give information to a participant and later tell them that the information was false, participants still believe the initial information. This effect is called the perseverance effect. For example, if we told a participant that they scored very low on an English test and later informed them that they actually did fine, the participant might still feel as if they performed poorly on the English test. In other words, the participant’s belief that they scored very low **persevered** even though they were told later that they did fine. We wanted to tell you about the perseverance effect so that you won’t still believe that the Pyrintease enzyme exists after you leave today.

We felt that we had to create a diagnostic test such as the PT saliva reaction test to accurately measure individual’s reactions to new health information. If we used a real medical test, some participants might have known their actual standing on that test and the study would not work for them.
We are interested in these questions because the answers have real life consequences. They can determine the effectiveness of educational materials used in junior high school health classes and mass media campaigns directed at reducing excessive drinking in 12 to 14 year old adolescents. Research has shown that excessive drinking that starts in junior high can lead to serious alcohol abuse in later life.

Since it is necessary that the participants in this study think that drinking 4-5 drinks in one sitting is dangerous, it is important that they believe the results of the PT saliva reaction test. If you know anyone who might be participating in this study, please do not tell them that they will be given a diagnostic medical test or that the study involves deception. If asked you can tell them that the study is about health behaviors.

Do any of you have questions or concerns? Did any of you think that the PT enzyme was fake? We designed the procedure to be as convincing as possible, do any of you have any suggestions to make it better? Once again let me emphasize that there is no such thing as the PT enzyme and therefore the enzyme test results were bogus.

If you have any questions, you can ask me (the experimenter) now or contact Dr. Gerrard or Dr. Gibbons directly. Thank you for your participation.

(*Participants are thanked and dismissed.*)
REFERENCES


